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Child Care Choices of Hispanic Families

Why Aren’t Families Using Center Care?

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This document was submitted as a dissertation in December 2009 in partial fulfillment of the requirements of the doctoral degree in public policy analysis at the Pardee RAND Graduate School. The faculty committee that supervised and approved the dissertation consisted of Sandraluz Cinisomo (Chair), Rebecca Kilburn, and Francisco Martorell.
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Chapter I. Introduction

While funding to Early Childhood Education (ECE) has increased significantly over the past 20 years, efforts to provide greater access to ECE for all children has become a particularly important issue over the past two years, garnering support from key policymakers. During his 2009 campaign, Barack Obama drew up what he called the “Zero to Five” plan, promising $10 billion dollars a year to efforts such as Head Start, Universal Preschool and a Child and Dependent Care Tax Credit (Weinstein, 2009). In recent months, the House of Representatives passed a bill including an Early Learning Challenge Fund (also expected to be passed by the Senate), which will provide $8 billion over 8 years to states for initiatives that improve education from infancy through preschool (Dillon, 2009). It is critical that these public funds be directed to ECE efforts that are going to have the greatest impact.

Hispanic children are likely to make up a large portion of those who are targeted with these new public ECE initiatives, as they are the fastest growing segment of the child population in the U.S. (Calderón, 2007; U.S. Census Bureau, 2004). Census projections indicate that Hispanics and Blacks under age 5 will outnumber non-Hispanic Whites by 2050 (Collins & Ribeiro, 2004). Hispanics are a particularly large segment of the population in California, and Hispanics account for 59% of the population of children ages 0 to 5 in Los Angeles County (Los Angeles County Chief Administrative Office, 2002; U.S. Census Bureau, 2000). Yet despite being such a large portion of the child population, Hispanic children in the U.S., California and Los Angeles County lag behind other children in terms of enrollment in preschools and child care centers (Chernoff et al.,
2007; Chyu et al., 2005; Karoly et al., 2006; NCES, 2006). Efforts to increase enrollment in child care centers\(^{1}\) are therefore likely to place a large emphasis on programs that target Hispanic children.

For new public funding efforts in ECE to have a significant impact on Hispanic children, it is critical to determine why these children are not using child care centers at the rates observed among children of other races and ethnicities. These racial/ethnic disparities in center child care enrollment rates may be the result of many different factors, including a lack of affordable child care centers, barriers to accessing care, and variation in preferences among parents. This study focuses on the role of three particular factors that have been acknowledged in the literature as potential causes of the lesser enrollment of Hispanic children in center care. These three issues include: access to relatives and the relationship between this access and use of relative and center child care, access to center child care and the relationship to use of center care, and the role of language as a barrier in preventing Hispanic families from accessing center care. Access to family child care and use of parental care are also important issues of access, but the focus of this study is on relative and center care.

Hispanic families in the U.S. are more likely to have relatives living in the household when compared to White families (Gonzales, 2002). It seems logical that this greater access to relatives would be associated with greater use of relative care and lesser use of center care, yet the findings on this issue are mixed (Capizzano et al. 2006; Fuller

\(^{1}\) For the remainder of this paper, the term “child care centers” will often be used to refer to a variety of child care providers, including nursery schools, preschools, child care providers, and other early childhood education providers that function in licensed centers. While the author acknowledges that these centers encompass a heterogeneous group of providers that are likely to vary widely in quality of the education provided (among other things), previous studies have argued that the lines between these various types of centers are increasingly blurred, and also use the terms interchangeably (Hirschberg et al., 2004; Kisker et al., 1991).
et al., 2006; Liang et al., 2000). More research is necessary to determine whether there is in fact a relationship between the presence of a relative in the household or neighborhood and the type of child care used. One particularly important issue that has not been addressed sufficiently in the literature is whether there are different relationships between access to relatives and use of relative and center care by race/ethnicity. Basic descriptive analyses indicate that there may be racial/ethnic differences in this relationship (Cappizano et al., 2006), and more rigorous analysis is necessary to fully explore the relationship between access to relatives and child care use.

The second issue addressed in this study, and the primary topic of focus, is access to center child care. The term “access” can refer to many things, from the number of child care centers within a proximal distance of the household, to the ability of family to find care that fits their needs in terms of schedule and costs, to whether the family is even aware of the child care center resources available. This study uses the term “primary access” to refer to the universe of affordable centers that are located within an accessible distance from a family’s home. This is distinct from “secondary access,” which refers to the centers that are truly accessible to a family after taking into account the various barriers they may face, including informational issues, potentially difficult enrollment procedures, and hours of care that do not coincide with non-traditional work schedules. The focus of the analysis is on primary access, as measured by the total number of slots within a reasonable distance from the family home relative to the number of children that may potentially want to access that center care. These centers include nursery schools, Head Start centers, California Department of Education (CDE) centers and preschools, and may other types of providers. Some of the analyses focus on publicly funded care,
which are primarily Head Start and CDE centers. I first examine whether there is lesser primary access to centers in Hispanic neighborhoods, and then attempt to model the relationship between primary access and use of center care to determine whether households with greater access to center care are more likely to use these centers.

This analysis of access to care provides both topical and methodological contributions to research in this area of child care. There are relatively few studies that examine access to child care centers by ethnicity, and those that do provide somewhat conflicting findings (Fuller et al., 1997; Goerge et al., 2007; Hirshberg et al., 2005). In addition, only Hirshberg et al. (2005) examines the relationship between access to care and use of care, so this study provides more evidence on this relationship. With regard to its methodological contributions, the analysis employs advanced spatial analysis techniques that allow for more accurate estimates of child care access than those used in most other child care research (such as simple ratios of supply to demand at the county or zip-code level).

The final topic of this study is the relationship between language and use of center child care. Previous studies have shown that parents who primarily speak Spanish are less likely to enroll their children in center care (Hirshberg et al., 2005; Liang et al., 2000), and this study will replicate the analysis in these studies. However, because I am also able to model primary access to Spanish-speaking providers, the analysis can introduce this measure of access to the language analysis to determine whether this relationship between language and use of center care is mediated by greater primary access to Spanish-speaking providers. This analysis can help to determine whether the
association between language and use of care are truly related to barriers in accessing care, or whether language is simply a proxy for preferences related to child care choice.

Data from Los Angeles County in 2000 is used to examine these various issues. The specific research questions addressed in this study include:

1) Are families with access to a relative in the home or neighborhood more likely to use relative care? Are they less likely to use center care? Do these relationships differ by the ethnicity of the family?

2) Do low-income families in highly concentrated Hispanic neighborhoods have higher or lower primary access to publicly funded center child care relative to neighborhoods with lower concentrations of Hispanics? How does this compare to access of all children to all center child care? What about primary access to Spanish-speaking providers?

3) Is primary access to center child care associated with greater use of child care?

4) Are primarily Spanish-speaking families less likely to use center child care? Does greater access to Spanish-speaking providers mediate this relationship?

If increased use of child care centers among Hispanic families is an important aspect of future efforts to expand ECE, the answers to these questions have important policy implications for how public funding for ECE should be spent. A finding that Hispanic families do not have different primary access to child care centers, and that primary access to child care centers is not associated with use of these centers, would imply that simply increasing funding to public centers and building more centers in Hispanic neighborhoods will not have a marked effect on the use of center care among Hispanic families. Policymakers may instead want to focus on reducing the barriers that restrict
secondary access to center child care for Hispanic families, by providing more information (in Spanish and English), ensuring that centers provide with more flexible hours of care, or reducing enrollment barriers. If it is instead preferences that are believed to be generating racial/ethnic differences in center care use, policymakers may want to use public information campaigns to shift these preferences, or allow for publicly funded care that provides a better fit with these preferences. However, the first step is to determine whether these families have equal primary access to center child care. Without enough affordable centers in low-income Hispanic neighborhoods, any efforts to overcome barriers and shift (or accommodate) preferences will not succeed in increasing Hispanic use of center child care.
Chapter II. Conceptual Framework and Organization of the Study

Child Care Choice Theory

The choice of child care by families is a complex process that often occurs in conjunction with family decisions about employment. The common economic view of child care choice argues that families will consider both the quality and cost of various arrangements in maximizing their satisfaction (Meyers & Jordan, 2006). The cost of parental care is lost wages, and this will be weighed against the cost of alternatives and the value associated with different types of care (and the quality of these types of care) to determine the optimal arrangement. These models predict that higher quality and lower prices associated with nonparental care will encourage women to use these nonparental care options. Other theories of child care choice focus on preferences and constraints. Several studies use Becker’s (1981) model of household production to structure this theory of child care choice (Casper & Smith, 2004; Radey & Brewster, 2007). The theory argues that parents weigh their preferences for different types of child care against competing preferences (things that could be purchased with the money used for child care) and constraints (such as time and money). Casper and Smith (2004) refer to this as the “preferences-and-constraints” model of child care choice. All of these models characterize the choice of child care as individual labor and consumption decisions, and focus on the role of economic costs and benefits in these decisions.

Sociological and cultural theorists have argued that viewing child care choice from a primarily individual perspective, with a focus only on the economic costs and benefits of various alternatives, result in the exclusion of many factors that play a critical
role these child care decisions (Fuller et al., 1996; Meyers & Jordan, 2006). These theorists argue that families rarely have perfect information about preferences and alternatives and do not conform to traditional assumptions about cost/benefit optimization. Instead, individuals must rely on shortcuts to simplify and rationalize their choices, and social networks provide the information and cues for these choices. The child care decision is not necessarily the rational economic decision that some economists argue it to be.

There are several examples that support this view of child care choice as one that is beyond a simple individual labor and consumption with a fixed, fully understood set of alternatives. One example is how parents define quality in different settings. Families often assert that quality is one of the most important aspects of their child care decision, and have very specific ideas about what quality is (Hofferth et al., 1998; Chaudry, 2004). Yet the perceived quality of different care settings is not highly correlated with quality indicators used by developmental experts, and most parents report high levels of satisfaction even as most care settings are reported be of poor or barely adequate quality (Emlen, 1998; Helburn & Bergman, 2002). It appears that quality is not a fixed aspect of care, but is shaped by the social and economic constraints that a family faces. Emlen (1998) finds that parents’ satisfaction is not predicted by type of care, intensity of care, or observable quality of care, but instead by the amount of flexibility the parents have in the workplace, family and care arrangements. Another study finds that families with greater access to relatives appear to place less value on the educational aspects of early childhood care (Johansen et al., 1996).
Incomplete information also plays an important role in decisions about child care. Parents rely heavily on social contacts to identify and assess various child care options (Chaudry, 2004; Gilbert, 1998; Hofferth et al., 1998). This reliance on social networks limits information. In a study of Hispanics in Los Angeles County, 61% used informal methods to find child care, and 22% were referred by friends or family members (Zucker et al., 2007). Not only does the reliance on social networks limit child care information, it also colors the information according to cultural norms. As family and friends provide the information on child care alternatives, they are also signaling to the parents which of these substitutes are acceptable as substitutes for maternal caregiving (Meyers & Jordan, 2006). This is likely to shape the preferences of parents and alter the way that they value different types of care.

The conceptual framework for this paper uses elements from both the economic and sociological/cultural theories of child care choice. Parents assign value to child care alternatives by weighing preferences against constraints (such as cost and time), but these preferences are based on incomplete information that is obtained through social networks and shaped by the constraints that parents face. Individuals in the same area with similar incomes may have access to a similar set of alternatives, but differences in the information provided by social networks will result in different perceived sets of alternatives, and social/cultural influences will shape preferences and lead to different values being assigned to these perceived alternatives. This is why family choices with regard to child care may not appear to be rational when considered against the full set of available alternatives and the values assigned to these alternatives by the more objective definitions of quality used by developmental experts.
A visual representation of the child care choice theory used in this paper is presented in Appendix A. On the left side of the diagram, parental availability (e.g. whether or not the mom works), access to relatives (having relatives in the home/neighborhood), access to center care and family care (in terms of the number of slots within a reasonable driving distance), and a family’s income interact to determine what is referred to in this study as Primary Access. These are the alternatives that are economically feasible and theoretically available for the family to use.

However, there are a number of barriers that may prevent these directly available alternatives from being practical child care options that are accessible to a family. The more narrow set of child care options available to a family after consideration of these barriers to access is referred to in this paper as Secondary Access. This is represented by the narrowing of the arrow the family encounters these barriers, with the circles constraining the arrow representing these barriers. An example of these barriers that limit secondary access is information, which plays a large role in limiting the number of alternatives a family is considering. While affordable center options may exist, if the family doesn’t know these centers exist or doesn’t understand that they qualify for subsidies that will make these centers affordable, these centers will not be included in the set of alternatives the family is considering. Another barrier to accessing directly available child care options is work schedule. Most centers and family care homes offer care during regular work hours, so these providers are viable child care options for parents that work regular hours (Presser, 2003). However, for parents with irregular hours, these providers may have open slots, but are not reasonable child care options because they are unable to provide care during the time it is needed. Onerous enrollment
procedures may also be a barrier to accessing care for some families. A barrier to care that is a particular issue for many families (or a factor that amplifies these other barriers) is language. There may be many affordable providers near the family’s home that are technically available for them to use, but if the parents cannot speak English well and the providers only speak English, it will be nearly impossible for the family to access these providers.

Once families have this set of child care options that are fully accessible (both primarily and secondarily), preferences play an important role by allowing families to rank these options and determine the optimal child care arrangement. In addition to helping families to rank child care options, preferences might cause them to eliminate some options altogether, represented by the additional narrowing of the arrow representing the set of child care alternatives. Preferences are largely shaped by family background and the cultural norms of their community. Beliefs about parenting and education are likely to play a significant role in preferences regarding child care, and these are in turn shaped by family background and cultural norms. Some of the elements that determine direct and indirect access are likely to feed into preferences as well. As described earlier in this section, the constraints on direct access may lead preferences to shift toward the types of care that are more affordable and available to them. Information also plays a major role in shaping preferences, because if parents are not aware of the benefits associated with different types of care, they may undervalue these providers. Language may also be associated with preferences, as parents may prefer that their children be in settings that are bilingual or English-only. Quality of care according to more objective measures such as the education of providers, adult/child ratio and group
size will certainly play a role in assigning value to each accessible care provider, but preferences will determine whether how these objective quality measures will play a role.

This study focuses on the role that primary access has on use of center care and attempts to determine whether racial/ethnic differences in primary access to relatives and primary access to centers can help to explain the lower rates of center care use by Hispanic children. In looking at primary access to centers, parts of the analysis focuses specifically on Spanish-speaking providers. While primary access to family care providers and primary access to parents in the home are certain to play a role in the set of alternatives a family faces, this study does not include analysis that specifically examines the role of primary access to these providers. However, mother’s employment status is included in all analysis as a control, and findings for the relationship between mother’s employment status and use of various types of care are presented in Chapter 5. Cost is taken into consideration in the analysis of primary access to centers by focusing on access of children in poverty to publicly funded care. Families under the federal poverty line in California are not required to pay any part of the cost of this public care, so affordability should not play a significant role in the decisions of poor families to use this publicly funded care.

Organization of this Study

In the next section of this report I discuss previous literature on a variety of topics related to use of child care. First I highlight findings on the short- and long-term effects of child care and ECE on children in the areas of cognitive ability, academic achievement and other outcomes, with a particular focus on the effects for low-income minority
children. I then summarize the literature on patterns of child care use, with the findings on racial/ethnic differences in the types of child care chosen as a primary topic of focus. Next, I group the literature on potential explanations for Hispanic differences in the types of child care used into three categories: primary access, secondary access, and preferences. In the discussion of primary access, I focus on the availability of relatives in the home and neighborhood and the availability of center child care slots within geographic proximity. The literature is presented on five areas related to secondary access, including information, enrollment issues, work schedule, and the issues of language and immigration status.

Chapter IV presents the data and methods for this study. There are three separate sources of data: one for use of child care in Los Angeles County, one for demand for child care in Los Angeles County, and one for supply of child care in Los Angeles County. Descriptions of each of these data sources are included. In terms of methods, there are separate descriptions of the analyses used for each of the chapters in this study, with a particular focus on the spatial analysis methods used to measure primary access to center care.

Chapter V examines the relationship between use of care and child and family characteristics. I first present racial/ethnic differences in the types of child care used. Then I discuss the large racial/ethnic differences in family characteristics to illustrate the importance of including these family characteristics as controls in any analysis of child care use. Finally, I use logistic regression analyses to determine whether racial/ethnic differences in child care use persist when controlling for differences in family characteristics. This chapter replicates the analysis done in many previous studies of
family characteristics and child care to determine whether the patterns found in the literature are also apparent in this data.

In Chapter VI, I examine the relationship between relative access and the use of relative and center child care. To approximate relative access, the analysis uses both the availability of relatives in the home and the availability of relatives in the neighborhood. To determine whether the relationship between relative access and use of child care differs by ethnicity, I estimate a model that allows for separate effects the presence of a relative in Hispanic and non-Hispanic households. The main purpose of this chapter is to determine whether greater use of relative care among Hispanic families helps to explain why these families are less likely to use center child care.

Chapter VII addresses the access of Hispanic families to center child care. Access is measured at the census block group level rather than the household level. I present the data for census block groups with low concentrations of Hispanic children (0-33.33% Hispanic), moderate concentrations of Hispanic children (33.33-66.67% Hispanic), and high concentrations of Hispanic children (66.67-100% Hispanic) to determine whether, on average, families in Hispanic neighborhoods have greater or lesser access to center child care. There are multiple levels of access included in the study. I examine the access of children in poverty to all publicly funded slots, access of children qualifying for California Department of Education (CDE) child care and preschool to CDE center slots, and the access of all children to all center slots, whether publicly or privately funded. I then look exclusively at Spanish-speaking providers. Similar tables by Hispanic concentration within census block groups are presented for access of children in poverty
to publicly funded Spanish-speaking centers and access of all children to all Spanish-speaking centers.

In Chapter VIII, I look at the relationship between access to center care and use of center care. This analysis focuses on children ages 2 to 5. The primary model of interest in this chapter examines whether greater access of children in poverty to all publicly funded child care slots is associated with increased use of center care by these children. In addition, I look at models of access of CDE-qualifying children to CDE child care centers slots and preschools and access of all children to all child care slots to determine whether the relationship between access to centers and use of center care differs across center type. While these analyses are not limited to Hispanic children, Hispanic families are a large part of the population of Los Angeles County and nearly 70% of the sample.

Chapter IX shifts the focus to Spanish-speaking providers and families that primarily speak Spanish in Los Angeles County. First I replicate analysis from previous studies that examines the relationship between language and use of center care, where those who primarily speak Spanish have generally been shown to be less likely to use center child care (Hirshberg et al., 2005; Liang et al., 2000). I then add access to Spanish-speaking providers to the model to determine whether a lack of access to Spanish-speaking providers mediates some of this relationship between language and use of center care. There may be several reasons for this association, but if controlling for access reduces the size of the relationship, it can be argued that providing increased access to Spanish-speakers in centers may reduce disparities in center care use for these primarily Spanish-speaking families.
Finally, Chapter X summarizes the findings from the study on the role of access to relatives and centers in generating ethnic differences in use of center care. These conclusions are then used to guide recommendations as to how public funding for child care can be spent to have the greatest effect on use of center care among Hispanic families.
Chapter III. Background and Significance

Benefits of Early Childhood Interventions

The most commonly cited reason for providing ECE is to ensure that children are prepared for school. For children who face limited family and neighborhood resources in early childhood and throughout their schooling years, quality care in the early years of life may be able to reduce the gaps in school readiness that have traditionally led to later problems with school completion and achievement for these low-income children (Duncan & Brooks-Gunn, 2000; McLoyd, 1998). There is a belief that all children should be provided with equal opportunities to receive a K-12 education in the U.S. educational system, and unless students are adequately prepared for school, they will fall behind quickly and be prevented from educational opportunities that more adequately prepared children are afforded.

In recent years, James Heckman, an American economist and Nobel laureate, has expanded understanding of the ways that ECE can contribute to both individual and societal well-being through the development of non-cognitive skills (Heckman, 2000; Heckman & Masterov, 2004; Heckman et al., 2006). Previous studies that tended to focus on cognitive skills (such as the ability to read and count) missed the many benefits that ECE was providing in the form of non-cognitive skills, such as persistence and dependability. Early childhood experiences play a large role in the development of both cognitive and non-cognitive skills, and some research indicates that non-cognitive skills are particularly affected by these early experiences (Heckman, 2006; Shonkoff & Phillips, 2000). Early childhood interventions that improve cognitive and non-cognitive skills are shown not only to be associated with achievement in education, but also with
better labor market outcomes, reduced crimes, and long-term economic well-being (Heckman, 2000; Heckman & Masterov, 2004; Heckman et al., 2006).

**Intensive Early Childhood Interventions**

The three most commonly studied ECE interventions are the Carolina Abecedarian Project, the High/Scope Perry Preschool Project, and Chicago Parent-Child Centers. The Carolina Abecedarian Project randomly involved the random assignment of 112 at-risk children between the ages of 6 and 12 weeks to either a preschool program or the control group. The program was the most intensive of the three programs, with children attending for ten hours every weekday for 5 years. The program size was small, with teacher/child ratios between 1:3 and 1:6. The program focused on language development, but also included medical and nutritional services. However, the study was able to isolate the effects of the educational services provided by the preschools by allowing the children in the control group to have access to similar medical and nutritional services (Masse & Barnett, 2002).

A series of studies document the benefits provided by the Carolina Abecedarian Project (Ramey & Campbell, 1984; Campbell & Ramey, 1995; Clarke & Campbell, 1998). Tests indicated significant gains in IQ and achievement in mathematics and reading at ages 8 and 12. Karoly et al. (2005) estimates the size of this effect to be 0.62. This compares to the achievement effect of 0.23-0.25 found for the Tennessee STAR project, an educational intervention that significantly reduced class sizes in early elementary grades (Finn & Achilles, 1999), and an effect size of 0.37-0.6 found in a study of a peer tutoring program (Greenwood, 1991). This indicates that ECE
interventions have the potential to be equally or even more successful than interventions in later years, and that public funding may be equally or even more productively spent on interventions in earlier years. The IQ effect of the Abecedarian Project had faded by age 15, yet the benefits to achievement remained significant through the most recent assessment at age 21. Other educational benefits experienced by the children involved in this program include lower levels of grade retention, fewer placements in special education classes, and a greater likelihood of having attended a 4-year college by age 21 (Clarke & Campbell, 1998).

The High/Scope Perry Preschool Project is another experimental intervention that targeted high-risk children of preschool age. In 1962, 123 children were randomly assigned to either the Perry Preschool or the control group and then followed through age 40 to explore the effects of the intervention on a variety of things including educational attainment, teen pregnancy, use of special education services, juvenile delinquency and employment. The Perry Preschool Project was also relatively intensive, serving no more than 8 children at a time, and providing education, health and family support for 2.5 hours each weekday for two years.

A study by Schweinhart et al. (2004) documents the many benefits provided by the High/Scope Perry Preschool Project. Similar to the Abecedarian Project, the Perry Preschool Project was found to produce short-term gains in IQ and longer-term gains in achievement and literacy. The achievement effect size is estimated to be 0.97, even larger than that found for Abecedarian. Participants in Perry Preschools were also more likely to graduate from high school and less likely to repeat a grade. Non-educational benefits of the intervention to its participants included greater likelihood of employment.
at age 40 and higher wages. There were also significant benefits to society in the form of reduced crimes among those who were enrolled in the preschools.

Unlike the Abecedarian and Perry Preschool Projects, the Chicago Parent-Child Centers (CPC) did not use random assignment, so studies of the effects of these centers must employ a quasi-experimental method, comparing the participants of these programs to a matched group of children who are enrolled in an alternative intervention. CPC is a federally funded program that provides educational services to children in high-poverty neighborhoods from preschool through age 9. The services provided by CPC were also quite comprehensive, including parent involvement outreach and nutritional/health services in addition to the educational component. The impact study follows more than 1500 children through age 22 to explore the program’s benefits.

The effects of CPC were somewhat smaller than those found in the experimental studies, but still quite large and highly significant (Karoly et al., 2005; Temple & Reynolds, 2007). In addition to the positive effects in achievement (effect size=0.35), CPC provided an average of a half a year of additional overall educational attainment (therefore more children graduating high school), an effect that is the same as that found for the Abecedarian Project and about half the size of the effect found for Perry Preschool. CPC participants also had reduced levels of grade retention and lesser use of special education services, and a greater likelihood of attending college. While it is too early to identify the effects of CPC on employment and earnings, CPC has been shown to reduce crime by 33% (compared to the 40% reduction produced by the Perry Preschool Project).
A series of studies have shown that these programs are not only beneficial to participants and society, but are also cost effective (Barnett, 1996; Karoly et al., 2005; Masse & Barnett, 2002; Schweinhart et al., 1993; Temple & Reynolds, 2007). Estimates of the total benefit per dollar invested range from $2.24 to $17.07, depending on the program studied and the benefits included in each study. However, a significant portion of these benefits are accrued by the individual, while policymakers may be more interested in the benefits these programs provide to society at large. Yet the estimates of societal benefit remain quite large, ranging from $2.69 to $7.16 per dollar invested. The cost effectiveness of early childhood interventions is not specific to these 3 programs. A meta-analysis of 48 preschool programs finds that the average benefit/cost ratio is 2.36 (Karoly et al., 2005). This compares to a ratio of 2.83 for the Tennessee STAR study of class-size reduction (Krueger, 2003), and 1.32 for Job Corp (Long et al., 1981).

Effects of Center Child Care

Most children do not attend child care programs that are as intensive as those discussed above, so it is critical to determine whether more typical child care settings can result in benefits to children. Beginning in 1991, The National Institute of Child Health and Human Development (NICHD) began a rigorous child care study that provides the most significant evidence of these benefits to children. This study determined that center child care do provide cognitive and language development benefits to children ages 6 months and older (NICHD, 2002; NICHD, 2006). The size of the effects found for center care range from 0.34 to 0.87 (when compared to use of all other kinds of care). Several other studies find somewhat smaller effects (0.10 to 0.15), and argue that these effects
fade out completely as a child moves through elementary school (Barnett, 2008; Magnuson & Waldfogel, 2005). Family child care provided in homes, on the other hand, has not been found to provide even short-term cognitive benefits (Barnett, 2008).

However, research indicates that enrollment in center child care does not necessarily lead to positive effects. A study of the long-term effects of child care finds that center child care must be high-quality to produce positive effects on cognitive development (Belsky et al., 2007). The NICHD study (while finding positive effects regardless of quality) concludes that quality is a critical factor, with effect sizes as large as the effect of parenting quality and poverty (NICHD, 2002). A series of studies indicate that the quality is key in determining whether children experience positive benefits from center child care (Burchinal & Cryer, 2003; Love et al., 2003; McCartney et al., 2007). These studies tend to define quality care by the ratio of adults to children, the size of the overall program, and the training of those providing the care.

In addition to the positive effects on cognitive development, a series of studies have found some negative behavioral effects from participation in center child care. Belsky et al. (2007) finds that teachers are more likely to report externalizing problems among children who were enrolled in center care. Bates et al. (1994) indicates that children who have attended center care are more likely to have difficulties with adjustment in kindergarten. These negative effects are found to be somewhat stronger for children who spend more time in these centers (NICHD, 2004). Yet just as higher quality in these centers is seen to increase the cognitive benefits, quality can also help to diminish these small negative behavioral effects that centers are believed to cause (Love et al., 2003; NICHD, 2003).
Head Start

Much of the research on the effects of child care has focused on Head Start. Head Start is a federally funded program created in 1965 to provide education, health, nutrition and parental involvement services to low-income children. In 2006-2007, the federal government spent $6.2 billion dollars on Head Start (Barnett, 2008). Head Start now represents has more than 2,600 providers serving more than 1 million children in the United States. Head Start has national standards for program structure and operation, yet providers may vary somewhat in the quality of care they provide beyond these national standards (Barnett, 2008). Eligibility for Head Start is determined by income, as families must fall below federal poverty guidelines to qualify.

Several recent experimental studies were conducted to measure the effects of Head Start by randomly assigning children either to Head Start, or to alternative community services or the waiting list for Head Start. The Impact Study of Head Start found small to moderate effects (0.05 to 0.25) in several cognitive domains (Puma et al., 2005). However, these measured effects may have understated the true effects of Head Start because there was substantial contamination to the samples, with only 86% of the treatment group actually attending Head Start programs, and 18% of the control group finding access to Head Start in other areas (Ludwig & Phillips, 2007). Abbott-Shim et al. (2003) found somewhat larger effects, with gains of 0.32 standard deviations on the Peabody Picture Vocabulary Test.

There have been a variety of other non-experimental studies that have shown Head Start to produce positive short- and long-term effects among attendees. These studies find that Head Start can improve cognitive development, and that gains in
vocabulary persist throughout elementary school (Currie and Thomas, 1999; Lee et al., 1990). Data from the Early Childhood Longitudinal Study (ECLS) indicates that Head Start increases school readiness (Magnuson et al., 2007). One study even suggests that Head Start might reduce crime among black children (Garces et al., 2002). On the other hand, a study of data from the National Longitudinal Study of Youth (NLSY) finds no long-term effects of Head Start in terms of school suspensions, grade repetition and math achievement (Aughinbaugh, 2001). Overall, researchers tend to agree that at minimum, children participating in Head Start experience moderate benefits to cognitive development (Barnett, 2008).

**State Preschool and Pre-Kindergarten**

In 2007 to 2008, 38 states provided publicly funded preschool for more than 1 million children at a cost of nearly $4.6 billion (Barnett et al., 2008). Funding for state preschool is typically targeted toward lower-income children, with 31 of the 38 states having income requirements. In recent years, 7 states including Florida, Georgia, Illinois, Iowa, New York, Oklahoma and West Virginia have committed to providing access to pre-Kindergarten for all 4-year-old children, yet Oklahoma is the only state approaching universal enrollment (Barnett et al., 2007). In addition to Head Start, state preschool and pre-K have become increasingly important as a provider of early childhood education to the nations children.

Recent studies of universal pre-Kindergarten programs have used regression discontinuity to demonstrate their effects. These studies use birthday cut-offs for eligibility to approximate treatment and control groups, where children with birthdays
that just make the cutoff are considered the treatment group and children with birthdays just after the cutoff are considered the control group, and it is assumed that there are no systematic differences between these two groups other than their birthdays. Gormley et al. (2005) focuses on the pre-K program in Tulsa, Oklahoma and finds effects ranging from 0.38 to 0.79 on a variety of cognitive tests. Regression discontinuity has also been used in studies of pre-K programs in Arkansas, California, Michigan, New Jersey, New Mexico, South Carolina and West Virginia (Barnett et al., 2008; Hustedt et al., 2008; Hustedt et al., 2007; Wong et al., 2008). The average effect sizes for these studies were 0.23 for general cognitive and language ability and 0.31 for math ability (Barnett, 2008).

Several other studies have used less rigorous quasi-experimental methods to examine the effects of state preschool. Barnett et al. (1987) studied preschool in South Carolina and found an effect of 0.33 on cognitive abilities at kindergarten entry, with these cognitive effects persisting into elementary school. A study of New York preschool found benefits to reasoning and other school-related skills, in addition to long-term evidence of a reduction in grade retention (Irvine et al., 1982). Studies using ECLS data find positive cognitive effects of 0.20, as well as long-term reduced grade retention and higher test scores in 3rd grade (Magnuson et al., 2004; Magnuson et al., 2007). However, these studies also demonstrate small negative effects on behavior, similar to those found in studies of center day care.

Effects for Low-Income Hispanic Children

Many of the early childhood education programs shown to have the greatest effects on cognitive development were targeted to low-income minority children
(Abecedarian, High/Scope Perry Preschool, CPC). Children in families of low socioeconomic status (SES) are more likely to have inadequate home environments in terms of the physical condition of the home, the quality of mother-child interactions, and the opportunities for learning (Duncan & Brooks-Gunn, 2000; McLoyd, 1998). Studies indicate that differences in home environment may account for up to half of the effect of income on cognitive development of preschool children and one quarter to one third of the effect of income on the achievement scores of elementary school children (Klebanov, et al., 1998; Smith et al., 1997). Other issues that are related to SES and may impact the school readiness of children include stress from unemployment and economic instability that leads to family conflict, poor mental and physical health of parents, and neighborhoods characterized by crime and a lack of facilities that encourage constructive activities for young children (playgrounds, libraries, etc.) (Duncan & Brooks-Gunn, 2000). High quality early childhood education has the potential to mediate some of these challenges that low-income children are more likely to face, reducing the gaps in school readiness (Loeb et al., 2007).

Because Hispanic children are more likely to be situated in low-income families (Ramirez & de la Cruz, 2003), they are more likely to face the many issues that low-income children often encounter. In addition, Hispanic children may face additional challenges that result in lower levels of school readiness. Studies indicate that Hispanic parents, particularly those who are recent immigrants and/or Spanish-speaking, are less likely to read to their children (Kuo et al., 2004; Lara-Cinisomo et al., 2004). The lower literacy levels of parents in these families is the most commonly argued reason for these patterns, and the lower SES of Hispanic parents, particularly lower educational levels, are
key. Currie and Thomas (1999) argue that preschool is important for helping to teach Hispanic children both verbal and non-verbal communication skills that may be somewhat different from those they encounter in the home. Immigrant and Spanish-speaking parents may face additional barriers to educational resources that translate to fewer opportunities for their children to engage in the activities that help to prepare children for school (Cosden et al., 1995). Early childhood education may therefore have an even greater potential to improve the chances of many low-income Hispanic children to be adequately prepared for school (August & Hakuda, 1997; Snow et al., 1998).

Studies have shown that low-income Hispanic children do experience significant benefits from preschool and child care, and these benefits are often greater than those experienced by low-income White children. Using ECLS data, Loeb et al. (2007) demonstrates that center care increases reading and math scores for all children, yet has a particularly large impact for English-proficient Hispanic children. And while the study results show a negative impact on socio-behavioral measures for children overall, this negative effect is not found among Hispanic children. A study of Head Start finds that the program reduces the gap in school readiness between Hispanic and white children by 1/4, and reduces the gap in probability of grade retention by 2/3 (Currie & Thomas, 1999). And finally, Gormley et al. (2005) concludes that white children did not benefit from the 2001-2002 pre-K program in Tulsa, Oklahoma, yet Hispanic and Black children did show improvement. Early childhood education therefore provides a promising means to ensuring greater academic success among Hispanic children. Magnuson and Waldfogel (2005) argue that making preschool enrollment universal for children in poverty and
improving quality of care could reduce the Hispanic-white gap in school readiness by 36%.

Patterns of Child Care Use

Overall Use of Child Care

Studies typically divide child care use into four distinct categories: parental care, center care, relative care and nonrelative care (including nannies, babysitters, neighbors, friends and family home care). Many children use more than one setting, so studies often provide distributions of children using a type of care for at least 1 hour per week as well as distributions for the type of care used for the most hours per week. In addition to providing distributions across care type for all children, these studies sometime present distributions across care type for children and families with differing characteristics, such as the age and race/ethnicity of the child, as well as the employment status and education level of the mother and the family income.

A national study of child care use indicates that 60% of all children ages 0 to 5 (not enrolled in kindergarten) have at least one weekly nonparental child care arrangement (NCES, 2006). Of these children, 60% are in center care, 35% are in relative care, and 22% are in nonrelative care arrangements. Use of nonparental care is somewhat more common among children ages 3-5 (73%), and older children are more likely to use center care (78%) and less likely to use relative and nonrelative care arrangements (28% and 15%, respectively). Another study using data from the ECLS birth cohort looks at distribution of settings where children aged 4 spend the most time (the main arrangement) (Chernoff et al., 2007). This study finds that 58% of children
spend the most time in center care, 21% spend the most time in parental care, 13% of children spend the most time in relative care, and 8% spend the most time in nonrelative care.

A study of child care use among children ages 3-4 in California finds that the distribution across care types is almost exactly the same as that found in national studies (Karoly et al., 2008). Of the 75% of children using nonparental care, 78% use center care, 27% use relative care, and 18% use nonrelative care. When looking at the main arrangement for these California children, center care is the most common (52.5%), followed by parental care (25.2%), relative care (13.7%) and nonrelative care (8.6%). The results of this study are somewhat different from those found in previous studies of child care in California (Karoly & Bigelow, 2005; Lopez & de Cos, 2004; Safir, 2004), but these differences are likely attributable to differences in sampling techniques and the timing of the surveys.

Chyu et al. (2005) examines the patterns of child care use for Los Angeles County and finds a somewhat different distribution across care types when compared to these national and statewide studies. Only 39% of children ages 3-5 (and not yet in kindergarten) were in some type of nonparental care in the four weeks prior to the interview. Of these children using nonparental care, 55% use center care as their main arrangement, followed by 27% who use relative care as the main arrangement, and 18% using nonrelative care as the main arrangement. Compared to the state and national studies of child care described above, this study finds children in Los Angeles County to be much more likely to use parental care, and when using nonparental care, less likely to use center care and more likely to use relative and nonrelative care.
One possible explanation for the significant differences in child care use found in this Los Angeles County study is that the survey was conducted throughout the year, including summer months when children may be less likely to be enrolled in some types of care (Karoly et al., 2008). However, the differences in use of child care almost certainly reflect differences in families and children living in Los Angeles County. Relative to California (and the United States), residents of Los Angeles County are more likely to be Hispanic, less likely to be employed, less likely to have a high school diploma, and more likely to be low-income (U.S Census Bureau, 2000). All of these demographics are closely tied to use of child care (as described in the next section), and are likely to generate significant differences in patterns of use.

Child Care Use and Family/Child Characteristics

There is a large body of literature that examines the variation in use different forms of child care by family and child characteristics (Capizzano et al., 2006; Chyu et al., 2005; Crosnoe, 2007; Fuller et al., 1996; Hirschberg et al., 2007; Hunts & Avery, 1998; Liang et al., 2000; Radey & Brewster, 2007; Singer et al., 1998). Some of these studies focus on use of center care or relative care, while others look at several different types of care. The studies use a wide range of national and local data sets and methods vary from simple cross-tabulations to logistic analysis to hazard analysis. Yet these studies tend to examine a relatively similar set of family and child characteristics, including the age and ethnicity of the child, the employment status, education level, and marital status of the mother, and family income. Some studies include other potentially relevant variables, such as the number of other children in the household (Hunts &
Avery, 1998; Singer et al., 1998), the age of the mother at the child’s birth (Chyu et al., 2005; Singer et al., 1998), the immigration status or nativity of the mother (Brandon, 2004; Chyu et al., 2005; Crosnoe, 2007), and the primary language spoken in the household (Hirshberg et al., 2005; Liang et al., 2000). This section describes the findings of the literature on the family and child characteristics that are relevant to this study.

One of the most critical family characteristics in determining the type of child care a family uses is the employment status of the mother. Mothers who are employed (part-time and full-time) are consistently shown to be more likely to use all types of formal care (Chyu et al., 2005; Crosnoe, 2007; Hirschberg et al., 2007; Hunts & Avery, 1998; Radey & Brewster, 2007; Singer et al., 1998). This makes sense, because when mothers are working they are less available to provide care for children themselves.

When looking at the type of formal care chosen among children who are using nonparental care, the findings on employment are not quite as clear. Fuller et al. (1996) compares use of centers to all other types of formal care and finds that employed mothers are less likely to use center care. Chyu et al. (2005) compares use of relative care to use of center care and finds that children with full-time employed mothers are more likely to use relative care, but there is no significant association for mothers working part time. The authors of this study argue that this association may be driven by the fact that families with relatives available for care are more able to return to full-time work.

However, this may also reflect the fact that many centers offer only part-time care, so mothers working full-time may find it more difficult to enroll their children in center care.
The relationship between the education level of the mother and the use of child care depends on the type of care in question. More highly educated mothers are consistently shown to be more likely to use center care (Capizzano et al., 2006; Crosnoe, 2007; Fuller et al., 1996; Hirschberg et al., 2007; Liang et al., 2000; Radey & Brewster, 2007; Singer et al., 1998). This relationship remains highly significant even when controlling for family income and the employment status of the mother, indicating that there is something unique to highly educated mothers other than income and employment constraints that leads them to make different choices regarding child care. On the other hand, studies show no relationship between the mother’s education and use of relative care (Chyu et al., 2005; Crosnoe, 2007; Hunts & Avery, 1998; Fuller et al., 1996; Radey & Brewster, 2007).

Results for the marital status of the mother are mixed. Many studies find that single mothers are more likely to use formal child care, including both relative and center care (Crosnoe, 2007; Radey & Brewster, 2007; Singer et al., 1998). However, several other studies indicate no association of marital status on type of care (Chyu et al., 2005; Hunts & Avery, 1998). Capizzano et al. (2006) determines that the association between marital status and care type varies widely across race/ethnicity. While single white mothers are more likely to use center care relative to married white mothers, single black mothers are less likely to use center care, and there is no relationship between marital status and center care use for Hispanic mothers.

The relationship between family income and use of child care is complicated. The traditional belief is that child care was costly, in particular center child care, so families with higher incomes would be more likely to enroll their children in center care.
Many studies do find this to be the case (Capizzano et al., 2006; Crosnoe, 2007; Hirschberg et al., 2007; Hunts & Avery, 1998; Karoly et al., 2008; Liang et al., 2000; Singer et al., 1998). Yet other studies find no relationship between family income and use of center care (Chyu et al., 2005; Radey & Brewster, 2007). The expansion of public programs in recent years has made center care a viable option for many low-income families (Karoly et al., 2008). It is likely that the relationship between use of center care and income is now U-shaped, with low- and high-income families more likely to enroll their children in center care than middle-income families who do not qualify for publicly subsidized care yet cannot afford to pay for center care either (Fuller et al., 1996).

As mentioned in the discussion of overall use of child care, age plays an important role in determining the type of care used. Studies consistently show that older children are less likely to use relative care and more likely to be enrolled in center care (Capizzano et al., 2006; Chyu et al., 2005; Crosnoe, 2007; Fuller et al., 1996; Hirschberg et al., 2007; Hunts & Avery, 1998; Liang et al., 2000; Radey & Brewster, 2007; Singer et al., 1998). Zucker et al. (2007) argue that Hispanic families in particular may be more likely to want children to stay home at earlier ages.

Racial/Ethnic Differences in Child Care Use

Studies have consistently shown that Hispanic families are less likely to use nonparental care. Nationally representative data indicates that only 49% of Hispanic children ages 0 to 5 are in nonparental child care, compared to 61% of white children, and 69% of black children (NCES, 2006). Analysis of the ECLS-B data indicates that only 73% of Hispanic 4-year-olds use nonparental care, compared to 82% of white
children and 84% of black children (Chernoff et al., 2007). These racial/ethnic differences in nonparental care use also hold for children in California and Los Angeles County (Chyu et al., 2005; Karoly et al., 2008). Children also differ by race/ethnicity in the types of nonparental care used. Hispanic children are consistently the least likely to use center care as their primary child care arrangement (Capizzano, 2006; Lopez and de Cos, 2004; NCES, 2006). Some studies indicate that black children are more likely to be in center care than white children, while others find relatively similar rates of center care use among black and white children. Studies also indicate that Hispanic children are somewhat more likely to be in relative care when compared to white children (Brown-Lyons et al., 2001; Capizzano et al., 2006; Chernoff et al., 2007; NCES, 2006).

To the degree that family characteristics differ by race and ethnicity, differences in use of child care by ethnicity should be apparent. According to the Current Population Survey (September 2009), Hispanics are more likely to be employed, have lower levels of education, and Hispanic families generally have lower incomes. Hispanic mothers are particularly likely to be unemployed and to have low levels of education (U.S. Census, 2000). As described above, these family characteristics are all associated with lower levels of center child care use, so it is likely that these demographic differences are largely responsible for the lower use of nonparental care among Hispanics, particularly the low use of center child care arrangements. However, several studies look at the associations between family characteristics and child care use and find that these associations differ significantly depending on race and ethnicity (Capizzano et al., 2006; Fuller et al., 1996). For black children, family characteristics cannot explain differences in child care use, because black children are often found to be the most likely to use
center care of all racial/ethnic groups, yet black families are also more likely to be low-income and have low levels of education relative to whites, and these family characteristics are associated with lower use of center care (Liang et al., 2000). Capizzano et al. (2006) finds that while the employment and marital status of the mother are important in determining whether white children are enrolled in center care, they play no role in the use of center care by Hispanic children. On the other hand, the study finds a positive relationship between the education level of the mother and use of center care (similar to white families), but no effect for black families. Fuller et al. (1996) also runs a separate model for Hispanic families and finds that employment status does matter for Hispanic use of center care, while the education level of the mother does not.

Despite these ethnic differences in the way family characteristics are associated with use of child care, the lower average SES of Hispanics is likely to play an important role. It is critical that studies looking to estimate any sort of “effect” of race/ethnicity on child care use control for family characteristics. Many studies have done this, and most continue to find that Hispanic families are less likely to use any formal care, and particularly less likely to use center care (Chyu et al., 2005; Crosnoe, 2007; Hirschberg et al., 2007; Liang et al., 2000; Singer et al., 1998). Yet several studies do find that controlling for family characteristics eliminates the relationship between ethnicity and use of center care (Fuller et al., 1996; Radey & Brewster, 2007). Many studies also find that when controlling for family characteristics, Hispanics are no more likely to use relative care (Chyu et al., 2005; Crosnoe, 2007; Hirschberg et al., 2007). Yet several studies do find that Hispanics are still more likely to use relative care when controlling

It is clear, therefore, that Hispanic families are less likely to use nonparental care and especially unlikely to use center care. Part of this difference is attributable to differences in SES, and some of it is clearly not. These studies examining the association between family characteristics and use of child care are typically unable to explain why these associations exist. It may be that low-income Hispanic families live in neighborhoods that have relatively few publicly subsidized centers, so these families do not have access to center child care. Even if there is not a lack of centers, these centers may be inaccessible to low-income Hispanic families because they do not have Spanish-speaking providers with whom the parents can communicate, or because parents in these families have work schedules that do not coincide with the hours that centers are typically providing care. It may also be possible that preferences are largely responsible for Hispanic differences in use of child care, if these families are more likely to feel that it is important for the child to spend as much time as possible with the family in these early years. The next sections describe the literature that addresses these potential mechanisms that may lead to different patterns of child care use among Hispanic families.

**Reasons for Differences in Child Care Use – Primary Access**

As noted previously, there is a strong relationship between the employment status of the mother and a child’s use of nonparental care. In some cases it may be that the mother chooses to stay home specifically to care for the child. For other families it may be that the mother did not work previously, or cannot find work, and is therefore
available to care for the child. Whether the mother makes the choice to stay home to care for her child or she cannot find work and is therefore available to care for her child, the presence of the mother in the home can be viewed as the child’s having access to parental care, where increased access to this parental care increases the likelihood a child will use that care. Because of this critical role played by a mother’s employment status, any analysis of child care choice must take this into account. Access to other sources of care is also important in determining whether a child will use that type of care, because greater access to a type of child care provider decreases the costs associated with using this care, making it more attractive to the family relative to parental care. This section reviews the research on these relationships between access to care are use of care. Access to relatives and access to center care are of primary focus in this review because of their relevance to this study. Access to family child care is also likely to play an important role, but is not examined in this study.

Primary Access to Relatives

Although the evidence is mixed as to whether Hispanic families are more likely to use relative care when controlling for family characteristics, it is still a common belief that Hispanics are more likely to use relative care, and that this may explain lower enrollment rates in center care. One of the primary explanations for the greater use of relative care among Hispanic families is that these families are more likely to have a relative living in the home or neighborhood. Gonzalez (2002) finds that in 2001, 22 percent of Mexican-American families and 18 percent of other Hispanic families had relatives living in the household, compared to only 6 percent of non-Hispanic white
families. Because the presence of a relative in the household provides a potential source of relatively cheap child care, it is reasonable to believe that families with relatives in the household will be more likely to use relative child care. However, it is difficult to determine the direction of the association, as families might ask relatives to move into the household or neighborhood to provide care when other options are not available, in which case use of relative care is caused by a lack of other care options rather than increased access to relative care. Regardless of the direction of causation, the expectation is that there should be a significant positive association between having a relative in the home and use of relative care.

Several studies have examined the association between having a relative in the home and type of child care used. Availability of a relative in the home or within 30 minutes of the home does seem to improve the likelihood that children will use relative care (Capizzano et al., 2006; Hofferth & Wissoker, 1992). On the other hand, the relationship between relative availability and use of center care is mixed. One study of 3 to 5 year olds in the 1993 National Household Education Survey (NHES) finds no association between whether there is a grandparent or other adult in the home and use of center care (Liang et al., 2000). Yet Fuller et al. (1996) uses the 1991 wave of this data, and finds that having a grandparent in the home is associated with children being less likely to use center care. The study runs separate models by race/ethnicity, and finds that this negative relationship holds for white and Hispanic children, but not for black children. Using data from the National Survey of America’s Families (NSAF), Capizzano et al. (2006) also finds a negative relationship between having a nonparental relative in the household and use of center care, but the relationship holds only for white
and black children, not Hispanic children. While access to relatives is associated with increased use of relative care, it is unclear whether it is also associated with lesser use of center care, particularly for Hispanic families.

Primary Access to Child Care Centers

Disparities in the supply of child care centers across neighborhoods have often been discussed as an important factor driving differences in child care choice. Two of the most important aspects in determining the available supply for a household are location and cost (Johansen et al., 1996; Radey & Brewster, 2007; Schlay et al., 2005). Zucker et al. (2006) finds that Hispanic parents in Los Angeles County are particularly likely to rank location as an important aspect of choice relative to parents of other ethnicities. Studies of child care and health care services often use the capacity of services within a certain area as an approximation of access, though child care studies often use the terms availability or capacity rather than access (Davis et al., 2009; Goerge et al., 2007; Guagliardo, 2004; Hirshberg et al., 2005; Lao & Thompson, 1999). In this study, the term “primary access” to child care centers refers to the number of centers slots located within a reasonable distance from the family home. Families with lower primary access would be expected to be less likely to use centers because there are not as many options available for them.

There are many studies that argue that prices play an important role in child care choice, and the high cost of center care relative to other parental and relative care make some centers inaccessible to low-income families (Blau & Hagy, 1998; Blau, 2001; Hofferth & Wissoker, 1992; Michalopoulos & Robins, 2000; 2002; Powell, 2002). When
low-income families do pay for child care, they often pay lower prices, but tend to spend a larger percentage of total income. Johnson (2005) finds that those below the poverty line spend 25% of their earnings on child care, compared to only 7% for families earning $50,000 or more. A study of Los Angeles County providers found that average weekly charges for centers grew by 61% between 1986 and 1999. (Samu & Muranaka, 2000). On the other hand, in a qualitative study of Hispanic families in Los Angeles County, cost did not seem to be a particular concern, with only 4% of respondents citing cost as a reason why families would not enroll their children in center care (Zucker et al., 2007).

The recent expansion of public expenditures on child care has likely reduced the importance of these price considerations for many low-income families, yet there are still concerns about the supply of affordable care because these public programs serve only a small portion of the population (Collins et al., 2000; Karoly et al., 2007).

California in particular has a strong commitment to providing affordable care to low-income families. The state provides a mix of federally-funded programs and state-funded programs (primarily targeted to low-income children) that were serving nearly 500,000 children by the fall of 2005 (Karoly et al., 2007). Publicly funded programs tend to be focused on providing care to preschool-aged children. Estimates indicate that 53% of eligible 4-year-olds and 25% of eligible 3-year-olds are served by this publicly-funded care (Karoly et al., 2007). However, access to child centers can vary widely across low-income neighborhoods in California. Fuller et al. (2002) found that there were 10 slots per 100 children in Los Angeles County, compared to 17 slots in Alameda County and only 5 slots in Merced County. A study of Los Angeles County child care capacity in both centers and licensed family care homes concludes that the supply of care for
preschool-aged children is adequate, though supply for infants and toddlers is not adequate to meet the county’s needs (Samu & Muranaka, 2000). However, this study finds that two of the Service Planning Areas (SPAs) of Los Angeles County, Central Los Angeles and Eastern Los Angeles, have the greatest shortage of child care services for young children, and are also the areas where there are particularly large concentrations of Hispanic children. The study looked at all providers, regardless of cost, funding source, or quality.

Several studies attempt to examine access for smaller areas (mainly zip codes) to determine whether neighborhoods within a region have differential access to center care by income and ethnicity. Some of the findings indicate that middle-income neighborhoods are the most likely to face limited access to center care (Fuller & Liang, 1996; Whitebook et al., 1990). Fuller et al. (1997) finds that affluent neighborhoods have 3 times greater access to center slots, and that access to centers is lower in neighborhoods with large Hispanic populations. Goerge et al. (2007) similarly finds lower access to center child care in areas of Chicago where there has been rapid growth in the population of children ages 0-5, with these neighborhoods tending to be areas with large or growing Hispanic populations.

Only one study could be found that examines whether increased access to center care is associated with greater use of that care. Hirshberg et al. (2005) uses a sample from three California counties (not including Los Angeles County) to examine the child care choices of parents who are moving from welfare to work. Contrary to what would be expected, children in areas with greater access to center care were less likely to use center care. The authors attribute this to California’s long effort to target public child
care resources to neighborhoods that need them the most, providing further evidence that California’s supply of center care to low-income families may be adequate. On the other hand, when looking at non-English speaking parents, greater access to center providers was associated with greater use of center care for their children. Increased access to child care resources seems to be particularly important for these families with non-English speaking parents.

Reasons for Differences in Child Care Use – Secondary Access

Even if low-income Hispanic families have an adequate supply of affordable child care centers within a reasonable distance from their home (primary access), they still may not be able to access these resources for a variety of reasons. Barriers to accessing child care can include information issues, a burdensome enrollment processes, and incompatibility with irregular work schedules. Many Hispanic families may face additional language-related barriers that prevent them from accessing care. There is a large body of research that discusses these barriers, with a particular focus on the difficulties that they may present to Hispanic families.

Information

Studies indicate that child care markets are characterized by imperfect information, where not every family is aware of the full set of child care options available to them, much less the cost or quality associated with these options (Blau, 2001; Helburn & Bergman, 2002). A large percentage of parents who are potentially eligible for subsidies misunderstand or are unaware of the rules for obtaining these subsidies (Meyers
Schlay et al. (2003) finds that of those who qualify for subsidies, 50% of those who say they do not need help with child care and 44% of those who say they do need help with child care incorrectly believe that they do not qualify. The study also showed that many parents incorrectly believed that subsidies could not be used on care that was not provided by a center. Fuller and Kagan (1998) find that services like resource and referral networks do play an important role in informing parents about child care providers. However, parents tend to rely heavily on social contacts to get this child care information (Chaudry, 2004; Gilbert, 1998; Hofferth et al., 1998). A family may therefore be more likely to use child care providers that are similar to those used by their family, friends and neighbors. Families with limited social networks may have particular issues with accessing information on every type of care.

This issue of limited information may be particularly great for Hispanic families. In a qualitative study of Hispanics in Los Angeles County, the most commonly cited reason why families might not enroll their children in center care was a lack of information (Zucker et al., 2007). Fuller et al. (1996) argues that low-income minority families are particularly likely to use family and friends as resources to identify and assess child care providers. Because relatively few Hispanics use center child care, and social networks are generally somewhat segregated by race/ethnicity, it may be difficult for a Hispanic family that wants to find a center provider to find social contacts that are able to provide them with any information. Accessing information outside of social networks is also particularly difficult for non-English speakers because the majority of this information cannot be found in Spanish. Vorsanger (2005) found that non-English
speakers in New York City had a particularly difficult time finding information on child
care subsidies.

**Enrollment Issues**

Families that are able to get the appropriate information about subsidies and child
care providers may still face issues with accessing these subsidies and providers because
of burdensome enrollment policies and/or long waiting lists. Studies indicate that the
process of establishing and maintaining eligibility can be time-consuming and highly
uncertain (Adams et al., 2002; Schulman & Blank, 2005). Schlay et al. (2003) found
that 37% of families that needed help paying for child care but did not obtain subsidies
reported hassles navigating the system as a major factor, including the paperwork and the
waiting lists they encountered. These families were also concerned that they would not
be able to use the subsidies for their preferred provider. Zucker et al. (2007) finds that
these enrollment issues are a barrier to care for Hispanic families in Los Angeles County.
17% of respondents reported that they had negative experiences enrolling their children
in care, and 27% reported at least some difficulty. The most common difficulty reported
was long waiting lists (9%), and the requirements and documentation for enrollment
were a barrier for 7% of families in the study. The study concludes that having greater
issues with enrollment was one of the only striking differences between Hispanic and
non-Hispanic parents.
Work Schedule

Most child care centers are open only during traditional work hours, and are therefore inaccessible to families that work non-traditional hours or have irregular work schedules (Collins et al., 2000; Presser, 2003). Efforts to provide centers with more flexible hours in Indiana, North Carolina, New Jersey and Texas have proven unsuccessful. Yet there are exceptions, including a center in Los Angeles that provides care until nine at night and on Saturdays (Collins et al., 2000). A number of studies find that parents who work non-traditional hours or have irregular work schedules are more likely to use relative and parental care and less like to use child care centers (Fuller et al., 1996; Helburn & Bergmann, 2002; Hofferth & Wissoker, 1992; Kimmel & Powell, 2001; Liang et al., 2000).

Mismatch between working hours and the hours in which center care is provided may be a particular problem for low-income Hispanic families. Low-income families, particularly minority families, are disproportionately employed in occupations that have non-traditional hours and/or irregular schedules (Browne, 1999; Padilla et al., 2006). Zucker et al. (2006) finds that 14% of Hispanic families in Los Angeles County report that irregular work schedules might prevent families from enrolling children in center care. However, Capizzano et al. (2006) looks at the child care choices of families where mothers are working at least part time, and finds that Hispanics are less likely to use center care whether their schedule is traditional or irregular, leading to the conclusion that incompatible work schedules does not completely explain the ethnic differences in use of center care.
Barriers for Primarily Spanish-Speaking Parents and Immigrants

Barriers to accessing center care may be particularly significant for immigrant parents that are not fluent in Spanish. Non-English speakers and immigrants may have more difficulty getting information, are likely to face additional burdens in the enrollment process, and may be less likely to obtain jobs with traditional hours (Brandon, 2004). Collins and Ribeiro (2004) find that language and cultural differences were frequently cited as a barrier to participating in Head Start programs. Another study indicates that mothers who consider centers ideal but don’t use center care perceive that language is a critical factor in obtaining and using info on child care centers (Becerra & Chi, 1992). Two-thirds of the non-English speakers in this study felt that language prevented them from getting the care they needed. Buyesse et al. (2005) finds that communication is one of the major difficulties that child care providers report in providing care to Hispanic families. And in a study of Los Angeles County, 23% of Hispanics reported that increased use of Spanish by providers would reduce the barriers to enrollment (Zucker et al., 2006). The same study also reports that U.S-born mothers are more likely to have a positive experience with enrolling children in center care, citing clear program info as one of the reasons for this. 46% of parents reported that having clearer information about eligibility requirements and/or disregarding immigration status would make Hispanic families more likely to use center care.

Studies have shown that Spanish-speaking parents are less likely to obtain subsidies, and less likely to use center care for their children (Hirshberg et al., 2005; Liang et al., 2000). Hirshberg et al. (2005) also examines the relationship between language and relative care, but finds no significant relationship. Several studies examine
the role of immigration status or nativity of the mother in determining the type of care used, and the results are mixed. In several studies the relationship to center care is found to be negative, with children of immigrant mothers being less likely to be enrolled in center care (Brandon, 2004; Crosnoe, 2007). Yet Chyu et al. (2004) finds that among families in Los Angeles County, immigration status/nativity has no association with use of formal care or type of formal care used. Radey et al. (2007) also finds no relationship for relative care, while Crosnoe et al. (2007) finds that immigrant families are less likely to use relative care. One explanation for why immigrants may be less likely to use relative care is that immigrants are often separated from their families, and therefore have to rely on themselves to provide this care (Buriel & Hurtado-Ortiz, 2000; Zucker et al., 2006).

The associations between language and immigration status and use of child care may be driven by differences in primary access and preferences as well. Primary access to center care may be lower because immigrant families have lower incomes than non-immigrant families that prevent them from affording care (Booth et al., 1997; Hernandez, 1999; Hofferth, 1999). Or it may be that these families lack primary access because they are more likely to live in segregated neighborhoods with fewer services (Borjas, 1995; Massey & Denton, 1992). Finally, immigrants and non-English speakers may have different values and parenting practices that affect their preferences with regard to child care. It is likely that primary access, secondary access and preferences all play a role in generating the differences in child care choices made by immigrant and non-English speaking parents. It may also be true that these differences become smaller as Hispanic
families become more acculturated. The next section discusses this potentially important role of preferences in child care decisions.

**Reasons for Differences in Child Care Use – Preferences**

There is a common belief that Hispanic parents do not believe that their children should attend preschool. A study of Hispanic parents in Los Angeles County disputes this assumption (Zucker et al., 2006). Ninety-three percent of respondents felt that children should attend preschool, because they are able to learn more at this young age, and because it helps to prepare children socially. However, 20% of parents expressed doubts about putting kids into preschool, for reasons including not wanting to let go of the child (7%), fear of abuse (3%) and issues with enrollment eligibility (2%). Interestingly, foreign-born mothers in the study were more likely to believe that children should be sent to preschool. The authors argue that this may reflect the fewer options these parents have in the form of relative and family-provided care. Overall, Hispanic parents in Los Angeles County do not appear to differ from all parents in their beliefs about sending children to preschool.

When choosing a type of child care, parents consistently cite quality as a critical factor (Chaudry, 2004; Hofferth et al., 1998; Schlay et al., 2005). Quality of child care as defined by developmental experts tends to focus on structural elements of the provider, such as caregiver education training, adult/child ratios, and group size (Whitebook et al., 1997). Yet parents tend to focus on aspects of care having to do with interaction between caregivers and children rather than these structural aspects, resulting in rankings of elements important to quality that are quite different from those of developmental experts.
Parents do recognize that quality varies across care types (Zucker et al., 2006), yet studies indicate that quality and satisfaction ratings are not consistent across types of care (Henly & Lyons, 2000; Meyers 1993; Sonnenstein & Wolf, 1991). Yet one quarter of the Hispanic respondents in Zucker et al. (2006) did not know what distinguishes center care from other care types, indicating a need for greater information about quality of care and centers in some communities.

Some studies have shown that ideas about quality and preferences for providers differ by family characteristics. Income and the education of the mother are believed to be associated with particular beliefs about care. Overall, parents with more education and higher income are more likely to stress quality as important in the choice of care (Peyton et al., 2001). More highly educated parents are more likely to place emphasis on the educational and developmental aspects of child care, while lower-educated parents are more likely to place emphasis on knowing the provider, and how the provider relates to the family and child (Johansen et al., 1996; Larner & Phillips, 1994). On the other hand, one study found that middle-class parents are more likely to choose relaxed child care settings that offset, rather than match the more intense educational environments at home (Rescolora et al., 1991). Stipek (1993) also found that lower income families were more likely to value basic skills, knowledge and work habits, while higher income families were more likely to stress enhancing the child’s self-concept. Yet overall the quality indicators cited by families with high education and income were more likely to be in line with those valued by developmental experts (Stipek, 1993).

There is also evidence that characteristics of child care that are valued by parents differ by ethnicity. Studies indicate that Hispanic parents prefer caregivers that are
familiar and have warm personal relationships with both parents and children (Fuller et al., 1996; Holloway & Fuller, 1999; Liang et al., 2000). Researchers attribute these preferences to cultural values in which Hispanics place greater emphasis on collective obligations over individualism (Collins & Ribeiro, 2004; Delgado-Gaitan, 1994; Hashima & Amato, 1994). On the other hand, several studies find that beliefs about quality of providers were relatively similar across ethnicities (Kimmerly, 1999; Zucker et al., 2006).

Several aspects of child care quality that might be assumed to be particularly important to Hispanic families are cultural factors and use of language. However, Zucker et al. (2006) finds that cultural factors were not very important to parents (only 6% mentioned it as important), and was surprisingly more important to U.S.-born mothers than it was to immigrants. Becerra and Chi (1992) similarly find that considerations of acculturation and/or assimilation do not play a major role in the child care choices of Mexican-Americans in Los Angeles.

With regard to language, a qualitative study with a relatively small (unrepresentative) sample indicates that use of Spanish with children was an attractive quality of child care providers (Fuller et al., 1996), while Zucker et al. (2006) finds that only 6% of parents in Los Angeles County cared whether the provider spoke Spanish with children. On the other hand, Early and Burchinal (2001) find that whether a provider speaks English is stated as a particularly important aspect of quality. Some Hispanic parents may want their children in bilingual settings, while for other parents it may be important that their child have a provider places an emphasis on English to ensure that the child is adequately prepared for school.
These differences in ideas about what constitutes quality care can be linked to choices of particular care types. Mothers who emphasize educational aspects of care are more likely to enroll their children in center care (Johansen et al., 2006; Phillips et al., 1987). Hispanic parents are assumed to be more drawn to relative and family care centers because of their preferences for warmer and more familiar settings (Fuller et al., 1996; Holloway & Fuller, 1999; Johansen et al., 2006). Along similar lines, Early and Burchinal (2001) find that parents who value a provider that could take care of a child while they were sick are more likely to choose relative or family day care, while parents who are more interested in the qualifications of the provider are more likely to choose center care. The study also determines that use of English by the provider is not important in determining what kind of care children receive.

One particular area of the literature attempts to link parental behaviors at home to choices regarding child care. The belief is that these parental behaviors, such as reading books with children and placing limits on television time, may reveal the values of parents and act as a proxy for the preferences they have for care of their children. Studies indicate that the more books a child owns and the less time children spend watching television, the more likely that child is to be enrolled in a child care center (Fuller et al., 1996; Liang et al., 2000). When compared to white parents, Hispanic parents in Los Angeles County are shown to be less likely to read to children and less likely to have more than the minimal amount of books in the home (as recommended by experts) (Lara-Cinisomo et al., 2004). The study finds that immigrant parents are particularly unlikely to read to children and to have many books. The study argues that this could be because immigrant parents have lower reading skills and are uncomfortable with reading to
children, or it may be that these parents are less aware of the benefits of reading to young children. These families may also have difficulty affording books for their children. Fuller et al. (1996), on the other hand, finds that there are no ethnic differences in the early literacy activities and TV-viewing patterns of young children.
Chapter IV. Data and Methods

Data

Use of Child Care

The Los Angeles Family and Neighborhood Survey (L.A.FANS) provides the data used to model child care use in this study. L.A.FANS was developed to study neighborhood, family and peer effects on the development of children in Los Angeles County. L.A.FANS was conducted by the RAND Corporation, a non-profit research organization in Santa Monica, in collaboration with the UCLA School of Public Health. The interviews for Wave 1 of this study were conducted in person, by professional interviewers from the Research Triangle Institute (RTI) between 2000 and 2001. Wave 2 data collection continued through 2008, and the data from Wave 2 will be available in 2010.

L.A.FANS is based on a stratified random sample of 65 neighborhoods from the 1,652 census tracts in Los Angeles County, where poor neighborhoods and households with children were over-sampled. Interviews were conducted in 3000 households, with one adult in each household randomly selected to provide information on all household members. For households with children under the age of 18, one child was randomly selected to participate in the study, and if that child had siblings in the household, one of those siblings was randomly selected as well. The primary caregiver of these children was also interviewed, and asked about the child's behavior problems, school-related performance and disciplinary problems, and current health and disability status, as well as child care history (including names and addresses of current providers), immigrant status, school enrollment, health and disability history, child support payments, contact with the
absent parent, residence history, and use of public and private social service programs (e.g., SSI, school lunch, after-school and recreational programs, Medicaid).

This study focuses on data collected for children ages 0 to 4, as well as children age 5 who are not yet in kindergarten. The age of the child and whether the child was enrolled in Kindergarten were both reported by primary caregiver, who was the mother for all but one of the children in the sample. The sample includes the randomly selected child and that child’s sibling. The child care variable of interest in this study is the primary type of child care used, also reported by the primary caregiver. Parents were first asked whether their child was in child care on a regular basis. Sixty-four percent of parents responded no to this question, and these children are assumed to have parental care as their primary source of child care. These results mirror those in a previous study of L.A.FANS data (Chyu et al., 2005). In comparison, a national study found only 40 percent of children to be using only parental care. This greater likelihood of using parental care only in Los Angeles County is driven by Hispanic children, of which 70 percent use parental care (compared to less than 50 percent of white children (NCES, 2006). The remaining 36 percent of parents that reported regular child care use were then asked what type of child care was used most. The responses for these primary child care providers can be grouped into three categories that have been used in previous child care studies: relative providers (including grandparents, aunts and uncles and siblings), non-relative providers (including family day care, nannies, neighbors, etc.), and center care (including childcare centers, preschool, Head Start, etc.) (Chyu et al., 2005; NCES, 2006).
Child and Family Characteristics and Measures of Interest

There are a variety of family and child characteristics that are strongly associated with child care use and are therefore important to include in the analyses as control variables. The child characteristics used in this study are child’s age and race/ethnicity. With regard to family characteristics, many of the variables are actually characteristics of the mother. The employment status of the mother is included to distinguish between mothers who are unemployed, employed part-time, and employed full-time. The mother’s education level is also used in the analyses as an important predictor of the type of child care used. In addition, marital status and the nativity of the mother are included for analyses in this study. The sample is limited to observations that have complete information for all of these variables. Family income is the final family characteristic used in each of the analyses in this study. Unfortunately, nearly 13% of respondents with children ages 0-5 chose not to provide information on income. To avoid losing so many observations and potentially biasing the results on the analyses, multiple imputation was used to estimate income values for these respondents (see Appendix B for a description).

The relative analysis in Chapter V explores the relationship between relative availability and the use of relative and center child care. The two variables that are used to approximate relative availability are the presence of a relative in the home and the presence of a relative in the neighborhood. Whether or not there is a relative in the home is determined by the household roster, a list of household members, ages, and relationships that is provided by the randomly selected adult. The randomly selected adult was also asked whether there were any relatives living in the neighborhood.
L.A.FANS provided interviewees in the study with the option of being interviewed in Spanish or English. Chapter VIII focuses on the relationship between language and use of child care. Previous studies have shown that when the parents of a child are not strong English speakers, the child is much less likely to be enrolled in center care (Hirshberg et al., 2005; Liang et al., 2000). For this study, the language used in the primary caregiver interview is assumed to provide information on the primary language spoken by the child’s parents. Mothers that conducted their interviews in Spanish are assumed to be relatively weak English speakers.

There are 866 total observations in the sample. Summary statistics for these variables are provided in Chapter V. With the exception of family income and whether there are relatives in the neighborhood, there is no missing data for the these 866 observations. The analyses in the study use weights provided in the L.A.FANS data set so that findings can be generalized to all children in Los Angeles County. These weights are constructed to account for the sampling of multiple children in some families, as well as the oversampling of poor neighborhoods.

Demand for Child Care

While the L.A.FANS data can be used to generate estimates of demographics for Los Angeles County, the data cannot be used to model the spatial distribution of children across the region. The 2000 U.S. Census data provides a much more accurate representation of the number of children in various neighborhoods throughout the county, and matches up well with the timing of the L.A.FANS data collection. The analysis in this study uses two different levels of census data, counts of children at the census block
group level, and counts of children at the tract level. Census block groups range from 600 to 3,000 people, with an optimum size of 1,500 people. In Los Angeles County, the average number of children ages 0 to 5 in a census block group is 140. Approximately 3 percent of census block groups have no children ages 0 to 5, and 5 percent of the census block groups have more than 360 children ages 0 to 5. In Los Angeles County, the majority of census block groups are relatively small. The median size of a census block group is 0.16 square miles. Census group blocks are subsets of census tracts, with an average of 3.7 census block groups in each tract. Census tracts usually have between 2,500 and 8,000 people. The average number of children per census tract ages 0 to 5 in Los Angeles County is 462. Only 0.6 percent of census tracts have no children ages 0 to 5, and 5 percent of census tracts have more than 890 children ages 0 to 5. The average size of a census tract in Los Angeles County is 0.46 miles.

For the purposes of this study, the maximum demand for child care in a census block group or census tract is estimated using the total population of children ages 0 to 5 or 2 to 5 in that region. As illustrated in the literature, every family is not interested in enrolling their child or children in center child care, so the actual demand for center care is never going to be as high as the total population. However, it is common to use the ratio of child care slots to the total population of young children to compare supply to demand (Fuller et al., 2007; Hirshberg et al., 2005). These statistics are typically presented as the number of slots per 100 children. This study similarly uses the total count of children to approximate demand. This demand is used for the analysis of all children to all center child care (public and private).
However, the primary area of interest in this study is the access of poor children to publicly funded child care. There are many different types of publicly funded child care in California, but the most prominent providers of publicly subsidized care are Head Start and the California Department of Education (CDE) (Karoly et al., 2008). These two sources of publicly subsidized care are the focus of this study. There are income restrictions for Head Start and CDE, and the income restrictions for 2000 are presented in Table 4.1. Unfortunately, the publicly available census data does not include the income of every family in the county. The census data does include the number of children ages 0 to 5 that are in families qualifying for Federal Poverty Status (the income qualification for Head Start), so the number of children ages 0 to 5 that could potentially qualify for Head Start can be exactly determined for each census block group. For each census block group and tract, the number of children ages 2 to 5 that qualify for Head Start was estimated by multiplying the proportion of children ages 0 to 5 that are in poverty by the total number of children ages 2 to 5.

Estimating the maximum demand for CDE child care and preschool was not as straightforward as Head Start demand. As Table 4.1 illustrates, qualification depends on both income and family size. Because the income qualifications for CDE child care are slightly higher for most families, this is the income standard used. However, because data is not presented for individual families, and because population counts are provided for ranges of income, census block group averages must be used to estimate the number of families that qualify. Census block data on income are presented in ranges of $20,000 to $29,999, $30,000 to $39,999, $40,000 to $49,999, and so on. Because the income restriction for a family of four is $39,000, the primary method of estimating the number
of children that qualify for CDE child care was to use the number of children in each census block group that are in families with incomes below $40,000. However, to adjust for the likelihood that family size varies significantly across census block groups, an alternate measure of the number of children was created to control for differences in average family size across census block groups (see Appendix C for a description).

<table>
<thead>
<tr>
<th>Family Size</th>
<th>Head Start</th>
<th>CDE Preschool</th>
<th>CDE Child Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>11,250</td>
<td>31,200</td>
<td>32,760</td>
</tr>
<tr>
<td>3</td>
<td>14,150</td>
<td>35,100</td>
<td>35,100</td>
</tr>
<tr>
<td>4</td>
<td>17,050</td>
<td>39,000</td>
<td>39,000</td>
</tr>
<tr>
<td>5</td>
<td>19,950</td>
<td>42,120</td>
<td>45,240</td>
</tr>
<tr>
<td>6</td>
<td>22,850</td>
<td>45,240</td>
<td>51,480</td>
</tr>
<tr>
<td>7</td>
<td>25,750</td>
<td>48,360</td>
<td>52,644</td>
</tr>
<tr>
<td>8</td>
<td>28,650</td>
<td>51,480</td>
<td>53,820</td>
</tr>
<tr>
<td>9</td>
<td>21,550</td>
<td>54,600</td>
<td>54,984</td>
</tr>
<tr>
<td>10</td>
<td>34,450</td>
<td>57,720</td>
<td>56,160</td>
</tr>
<tr>
<td>11</td>
<td>37,350</td>
<td>-</td>
<td>57,324</td>
</tr>
<tr>
<td>12</td>
<td>40,250</td>
<td>-</td>
<td>58,500</td>
</tr>
</tbody>
</table>

Table 4.1. Income Requirements for Publicly Subsidized Child Care (2000)

The total number of children used to calculate demand for each type of care is presented in Table 4.2. Approximately one quarter of children ages 0 to 5 in Los Angeles County live in families that qualify for Federal Poverty Status and are therefore considered as potential demand for all publicly subsidized care. A somewhat greater percentage of Hispanic children (31%) are in poverty. A little more than half of children in Los Angeles County are estimated to qualify for publicly subsidized CDE child care and preschool. The numbers are slightly lower for the estimates of CDE-qualifying children that control for average family size in each census block group.
Table 4.2. Number of Children Considered as Potential Demand for Child Care in Los Angeles Care

<table>
<thead>
<tr>
<th></th>
<th>Ages 0 to 5</th>
<th>Ages 2 to 5</th>
<th>Hispanic (0 to 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Children</td>
<td>886,128</td>
<td>599,108</td>
<td>529,137</td>
</tr>
<tr>
<td>Children in Poverty</td>
<td>221,791</td>
<td>149,829</td>
<td>165,015</td>
</tr>
<tr>
<td>Children Qualifying for CDE</td>
<td>465,616</td>
<td>314,179</td>
<td>-</td>
</tr>
<tr>
<td>Children Qualifying for CDE (Alt)</td>
<td>455,802</td>
<td>307,736</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: The number of Hispanic children qualifying for CDE was not estimated.

Supply of Child Care

The data on the supply of child care was obtained from the California Child Care Resource and Referral Network. This data includes a record for every licensed child care center in Los Angeles County and the surrounding counties (Kern, Ventura, San Bernardino and Orange). In addition to the name and the zip code of the child care center, the data set included the total number of slots by age (0-1, 2-5 and 6+), the languages spoken by the provider, and whether or not the center received funding from Head Start, CDE, or some other public source. Because the data did not specify the level of public funding, I had to make the assumption that every slot in a publicly funded center was funded.

It was critical to the spatial analysis in this study that exact addresses for each center be used (see the section on Methods). Unfortunately, exact addresses were not collected by the California Child Care Resource and Referral Network until 2004. So to obtain addresses for the 2000 centers, the 2000 and 2004 data sets had to be matched. For every 2000 center that could be found in the 2004 data set (by zip code and name), the 2004 address was assumed to be relevant for 2000. Of the 2,285 child care centers in
Los Angeles County in 2000, 1,776 (78%) were able to be matched to 2004 addresses. The remaining 22 percent of centers either closed, changed names, or changed zip codes between 2000 and 2004. For these centers, the population-weighted centroid of the zip code is used to approximate the location of the center.

As previously mentioned, a number of different models are used in this study. Table 4.3 presents the total numbers of centers and slots in Los Angeles County that fall under each of the supply categories used in these models. Only 5.7% of all child care slots and 4.5% of public child care slots for children ages 0 to 5 in Los Angeles County are reserved for infants. Because of this, the majority of the analyses in this study that look at access focus on children ages 2 to 5. The primary model looks at the access of children in poverty to all publicly provided child care. The supply for this model includes Head Start centers, CDE centers, and centers funded by other public entities. These centers account for 30.7% of all centers, and 27.7% of slots. Another model focuses exclusively on CDE centers, which make up 19.6% of all centers and 18.6% of all slots. This means that the majority of publicly funded centers and slots in Los Angeles County are in CDE preschools and child care centers. There are also analyses that look at the access of all children to all centers, both publicly and privately funded centers. Finally, there are models that focus exclusively on Spanish-speaking providers, where centers have self-identified whether they speak Spanish, and it is assumed that this means that at least one of the providers in a center speaks Spanish. One model includes all Spanish-speaking centers, while the other focuses on publicly funded Spanish-speaking centers. More than half of all centers and more than 2/3s of all public centers in Los Angeles County are Spanish-speaking.
### Table 4.3. Supply of Child Care in Los Angeles County

<table>
<thead>
<tr>
<th></th>
<th>% of Total Centers</th>
<th>% of Total Slots Ages 0-1</th>
<th>Ages 2-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publicly Funded Centers</td>
<td>30.7</td>
<td>21.4</td>
<td>27.7</td>
</tr>
<tr>
<td>Centers Funded by CDE</td>
<td>19.6</td>
<td>19.1</td>
<td>18.6</td>
</tr>
<tr>
<td>All Spanish-Speaking Centers</td>
<td>52.6</td>
<td>59.3</td>
<td>52.7</td>
</tr>
<tr>
<td>All Publicly Funded Spanish-Speaking Centers</td>
<td>21.7</td>
<td>16.0</td>
<td>20.7</td>
</tr>
<tr>
<td>N (Total # Centers/Slots)</td>
<td>2,285</td>
<td>6,837</td>
<td>112,489</td>
</tr>
</tbody>
</table>

### Methods

**Use of Child Care**

All of the analyses in this study use binomial logistic regression to estimate the associations between the variables of interest and the use of various types of child care. The general form of a logistic regression is:

\[
\ln\left(\frac{\pi}{1-\pi}\right) = b_0 + b_1x_1 + b_2x_2 + \ldots + b_kx_k
\]

where \(\pi\) is the expected use of a type of child care with regression coefficients \(b_1\) to \(b_k\) and intercept \(b_0\) when the values for the family and child characteristics and variables of interest are to \(x_1\) to \(x_k\). The results for binomial x variables in this study are presented in the form of odds ratios. Odds ratios are computed by subtracting the value of the logistic regression when the value of the regressor is equal to 0 from the value of the regression when the value of the regressor is equal to 0. However, when examining the results for
the access to center care, a continuous variable, marginal effects are more appropriate than odds ratios. Marginal effects are computed according to the following equation:

\[ ME(X_k) = P(Y = 1 \mid X) \times P(Y = 0 \mid X) \times b_k \]

Marginal effects are also presented for the child’s age and family income when these variables are entered into equations as continuous variables.

The analyses in Chapter V use binomial logistic regression to examine differences in use of various types of child care (parental, relative, non-relative and center) by child and family characteristics for all children in the sample ages 0 to 5. The focus of the analysis then turns specifically to use of center care, and the relationships between use of center care and these child and family characteristics are examined for the various populations of interest in this study (children qualifying for publicly subsidized care, children qualifying for CDE child care, and all children). These relationships are examined for children ages 0 to 5 and ages 2 to 5. Chapter VI looks at the relationship between access to relatives in the home and neighborhood and use of relative/center care. These analyses use the full sample of children ages 0 to 5. Two indicator variables, “whether or not a child has a non-parent adult relative in the household” and “whether or not the parent of a child reports that there is a relative in the neighborhood” are used to model relative access. These indicator variables are added to the other child and family characteristics in the binomial logistic regressions of relative and center care use. This chapter also interacts the “relative in the home” variable with the Hispanic variable to generate separate estimates of this relationship for Hispanic and non-Hispanic children.
Chapter VIII looks at the relationship between access to center care and use of center care. Again, these analyses use the full set of child and family characteristic controls to binomial logistic analyses of center care use, and simply add estimates of center access at the census tract level. There is some concern that with the small sample sizes involved in these analyses, the relatively large number of control variables may lead to a lack of significance for the marginal effects of access. To address this, an additional version of the primary model (access of children in poverty to all public slots) is estimated using only child characteristics and variables that model access to various types of care (mother’s employment status and the presence of a relative in the household). This simplified model does not lead to differences in the significance of results in any of the other models, so the full model including all child and family characteristics are used for the majority of analyses.

In Chapter IX I examine the relationship between language and use of center care. The language used by the parent for the L.A.FANS parental interview is the variable of interest, and is assumed to approximate the main language used by the parents of each child. Parents only had the option to interview in Spanish or English, so the language analyses are not relevant for Asian or Pacific Islander children (or any other non-Spanish, non-English speaking parents). The Spanish interview indicator variable, as in the other analyses, is added to a binomial logistic regression of center care use that controls for all child and family characteristics, with the exception of nativity. Nativity and language of interview are highly correlated, with fewer than 2% of U.S.-born mothers (only 13 observations) interviewing in Spanish. However, more than 35% of foreign-born mothers chose to interview in English, providing some assurance that language use is not
serving as a proxy for nativity or immigration status. After examining the association between language and center care use, I add access to Spanish-speaking providers to determine whether increased access to Spanish-speaking providers diminishes the association between language and center care use. Models that interact access and language allow for differential effects of access for children in Spanish-speaking and English-speaking families.

When examining these relationships between primary access to child care providers and use of child care, these access variables are likely to be endogenous, which could lead to bias in estimating these relationships. It was not possible to eliminate this issue of endogeneity because this data is not gathered from an experiment, and it was not possible to employ non-experimental techniques such as regression discontinuity or instrumental variables to approximate an experiment. Endogenity will lead the odds ratios and marginal effects of logistic regression to be biased.

In terms of mother’s employment, the mother could already be unemployed and have chosen to be unemployed for reasons other than child care, and in this case the odds ratio of mother’s employment on use of child care could be interpreted to represent the “effect” of mother’s employment on use of child care. However, if a mother must stay home to take care of her children because there are few alternative options for care, then the relationship is endogenous and the odds ratio from logistic analysis is likely to overestimate the true effect of employment on choice of child care (because it is also estimating the effect of child care choice on employment). The problem of endogeneity is also likely to be present for analyses using primary access to relatives and primary access to centers. If the need for child care leads relatives to move into the home or
neighborhood, then the relative access variable is endogenous, and the relationship between primary access to care and use of relative care will be biased upward. If residents in an area are known to be very unlikely to use centers for child care and centers decide not to locate in the area for this reason, than the estimate of the effect of primary access to center care on use of center care will be biased upward.

Because of this issue of endogeneity, I am careful throughout this study to refer to the odds ratios and marginal effects of logistic regression as “relationships” rather than “effects.” The true effect of primary access to a provider and use of that provider is likely to be overestimated by these estimates that are referred to as “relationships.” I also tested my models relating primary access to center care to use of center care with and without controls for the mother’s employment to ensure that the endogeneity of mother’s employment wasn’t leading to bias.

**Spatial Analysis of Primary Access to Child Care**

As discussed in previous chapters, the primary factors that are argued to determine primary access to a child care center are (a) whether the center is affordable for a family; and (b) whether or not the center is located within a reasonable distance from the home. This is a distinct concept from secondary access, which encompasses barriers that a family may face that prevent them from accessing care that is affordable and reasonably located, such as limited information, language barriers, and non-traditional work schedules. Cost is unlikely to be a limiting factor for families in poverty, as there are many free child care options available to these families in California (Karoly et al., 2008). As a result, the availability of center child care within a reasonable distance from
a child’s home is assumed to be the main determinant of primary access for children in poverty. This measure of access does not take into account quality, and therefore assumes all centers to be of equal quality. So this measure of primary access is access to any center slot, regardless of quality. This is likely to be less of an issue for the analyses that focus on publicly funded providers, because there are standards that regulate certain aspects of these providers that are associated with quality, such as the education and training of the provider and the adult to child ratio.

To estimate the primary access of children to child care centers, this study uses a spatial analysis technique called a two-step floating catchment method, a technique that is increasingly being used in health care research to measure access to health care services (Davis et al., 2009; Luo & Wang, 2005). This method was originally developed by Radke and Mu (2000), but has since been modified to create the technique used in this study (Davis et al., 2009; Luo & Wang, 2003; Wang & Minor, 2002). The first requirement to allow for use of this GIS-based method is to determine exact geographical locations for those demanding and supplying child care. As discussed in the data section on “Supply of Child Care,” exact locations of centers were not collected in 2000, so 2004 locations had to be merged for the 78% of centers that were still open. For the 22% that could not be matched between the 2000 and 2004 data, only zip codes were available, so population-weighted geographical centers of zip codes had to be used to estimate the locations of these centers. In several case this resulted in multiple centers located in a single location, and this necessity to estimate locations is certain to add some degree of error to the accessibility estimates.
Demand for child care is estimated at the census block group and census tract level rather than determining access for each individual household. This is common among studies using this two-step floating catchment method. All households in a census block group or census tract are not located in at the same point, yet a single location must be used to represent this area. To improve the estimate of the assumed location of households, the population-weighted geographic center point was used rather than the actual geographic center. These population-weighted centers were created using block-level data from the 2000 census. For urban areas like Los Angeles where population is relatively dense, the use of census block group weighted centers are likely to be relatively close to the actual location of the household. Because the median size of a census block group in Los Angeles County is 0.12 square miles, the time required to drive across a census block group is likely to be less than 1 minute. However, there are some areas of Los Angeles County that are significantly more sparse. Of the 6,351 census block groups in the county, 4.6% have an area greater than 1 square mile, and slightly more than 1% have an area greater than 5 square miles. For these particular census block groups, estimates that assume population-weighted mean centers for all households are likely to introduce significant estimation error. The error associated with estimation at the census tract level will be somewhat greater. However, the median tract size for Los Angeles County of 0.46 square miles is still relatively small, and only 3.4% of census tracts in the county are larger than 5 square miles. Census block groups are primarily used to measure access and determine whether heavily-concentrated Hispanic areas have differential access. However, the data from L.A.FANS used to link access to center care to use of center care only has data on the 1990 census blocks of families, but does have data on the
2000 census tracts of these families. So census tract level access had to be used for these analyses. The accessibility statistics based on census tract data does not appear to be significantly different from tract-level averages of block group accessibility statistics (see Appendix D), so the use of tract-level data in Chapter VIII should not introduce so much error as to significantly affect the results. Further, census tracts are the level of data used to calculate accessibility in many of the analyses using these methods (Davis et al., 2009, Goerge et al., 2007).

In addition to the locations of “demanders” and “suppliers” of child care, a measure of demand and supply must be associated with each of these locations. As described in the data section, the measure of demand for each census block group in the primary model is the total number of children in poverty between the ages of 2 and 5. Other models use all children between the ages of 2 and 5 (or 0 and 5) and the estimated number of children that may qualify for publicly subsidized CDE care. On the supply side, the total number of slots in each center are provided, and these slots are broken down into slots for children ages 0 to 1 and 2 to 5, allowing for separate accessibility statistics to be created for children ages 0 to 5 and 2 to 5. However, because so few spaces are provided for infants, the accessibility statistics for children ages 2 to 5 are of primary interest in this study.

Given this information on the locations for suppliers and demanders of child care and the levels of supply and demand for these providers/census block groups, the two-step floating catchment can be employed. This method uses ESRI’s ArcGIS and the Network Analyst extension to compute matrices of distance and total travel time from each demand location to each supply location in Los Angeles County. To implement the
method, a buffer zone must be generated by assuming a particular amount of travel time as the maximum time one would be willing to travel to for child care. The primary buffer zone used in this study is 10 minutes. There is no substantial justification for the use of a 10 minute travel time as the maximum one would be willing to travel for child care aside from a personal assumption (and anecdotal confirmation) that this is a reasonable estimate of the time an average family would be willing to drive. However, the maximum accessibility buffer for low-income families that may not have reliable transportation may be somewhat lower, and for others the threshold may be higher, so buffer levels of 5 minutes and 15 minutes travel time are also examined in sensitivity analysis.

As implied by its name, the technique involves two steps:

- Step 1: For each child care center, find all census block groups (or tracts) that are within distance buffer threshold $d$, and divide the total number of slots in this center by the sum of the demands in these regions. These ratios can be referred to as “supply ratios.”

- Step 2: For each census block group (or tract), find all centers that are within distance buffer threshold $d$, and sum the “supply ratios” for each of these child care providers.

These statistics provide an easily interpretable accessibility statistic that represents the number of slots per child. A statistic of 1 would indicate that there are exactly enough center care slots for each child in the floating catchment regions. Child care capacity is commonly provided in slots per 100 children, so this is the accessibility measure.

---

2 These statistics were calculated using Visual Basic for Applications scripts written by RAND Corporation programmers using ESRI’s ArcObjects application programming.
provided in this study, and simply requires multiplication of the accessibility statistic by
100 (Fuller et al., 2002; Hirshberg et al., 2004).

It is likely that some families along the borders of Los Angeles County use
providers in these bordering counties, and families in these neighboring counties may
also use Los Angeles County centers. If this potential supply and demand is not taken
into account, there may be “border effects,” where access in these statistics differ widely
from the true levels of access in these areas. To account for this, supply and demand data
was collected for surrounding counties as well. Access statistics were generated for a 15-
minute buffer around the borders of Los Angeles County to assure accurate measures of
access for neighborhoods in these areas.

Previous studies of primary access to child care (what many call availability)
tended to look at the number of slots per child within a fixed area, such as a county or zip
code. Fuller et al. (2002) looks at slots per 100 children by county in California, similar
to a previous study that looked at number of centers per 1000 children in counties across
the United States (Fuller & Liang, 1996). Other studies look at the primary access at the
zip code level within one county, or several counties (Fuller & Liang, 1996; Hirschberg
et al., 2004). Spatial analysis techniques such as the two-step floating catchment method
significantly improve upon previous studies for two major reasons. The first is that they
do not assume equal access of every family to every provider within the area. This is a
particular issue when larger areas such as counties are used. In a county as large as Los
Angeles County, it is extremely unreasonable to assume that child care centers in Long
Beach are viable options for families in Burbank, a city that is more than 35 miles away,
and would require at least 45 minutes each way in driving time. The second issue with
previous fixed-area techniques is that they assume that no one will cross over the boundaries of these areas to access child care providers. This may be somewhat realistic when the level of analysis is a county, but it is quite likely that parents often cross zip code boundaries to reach their child care provider.

Only two studies of child care access using more advanced spatial analysis techniques could be found. Lao and Thompson (1999) examine access to child care in Monterey County. However, they conclude that because they only have demand data at the zip code level, the estimation error involved in using a catchment technique will be too great. Instead they use cartographic modeling, which basically uses maps to attempt to identify underserved areas and a relative ranking of zip codes in terms of whether or not there appears to be a shortage of services rather than an absolute measure of access to child care. The second study, Goerge et al. (2007), examines access to child care in the city of Chicago using the same two-step floating catchment technique that is employed in this study. However, the analysis in this study improves upon the methods of this previous study in several areas. I am able to generate access statistics at the census block group level, while Goerge et al. (2007) uses census tracts. The use of smaller regions to estimate demand for child care leads to smaller estimation errors that are generated from the assumption that all families in the area live in the population-weighted center of these regions. In addition, the previous study used 1-mile and 2-mile distances to generate buffer zones, which are less relevant than the 5 to 15 minute travel times that are used to create buffer zones for this study. No previous studies have used travel time to approximate primary access using spatial analysis, though this has been done in a health services study (Davis et al., 2009). Finally, George et al. (2007) does not account for
supply and demand in neighboring cities, resulting in substantial border effects that bias the estimates for census tracts on the edge of the city.

The next chapter provides summary statistics for child and family characteristics by race/ethnicity to determine whether there are differences and whether these things should be controlled for in the study. In addition, logit analyses are used to examine the relationships between use of various child care providers and the child and family characteristics. Finally, the relationships between these child and family characteristics and use of center care are examined for each of the populations of interest.
Chapter V. Overview of Child Care Use in Los Angeles County

Two recent studies provide descriptive analysis of the child care data in the L.A.FANS sample. Chyu et al. (2005) finds that 37 percent of children ages 0 to 5 received some type of regular non-parental care in 2000-01. Of these children, 37 percent used relative care, 24 percent used non-relative care, and 39 percent used center care. Hispanic families were found to be less likely to use non-parental care, and when using non-parental care, were less likely than African-Americans to use center care. Lara-Cinisomo et al. (2004) finds that not only are low-income Hispanic families using different types of care, but children in these families are also much less prepared to enter school than other children. These descriptive analyses provide useful information about the L.A.FANS sample that can be used as a starting point for this study.

The results from the sample constructed for this study mirror the results in Chyu et al. (2005). Figure 5.1 shows that Hispanic children are significantly less likely than white and black children to be enrolled in center care. Hispanic children are also the most likely to be in parental care only settings. Asian families are the most likely to use relative care. However, these results do not control for differences in family characteristics across ethnicity. Differences in family characteristics may explain a large portion of these differences in type of child care used.
Table 5.1 presents the summary statistics for family characteristics by ethnicity. These results confirm that the families of Hispanic children are significantly different across many of the variables of interest. Hispanic mothers are more likely to be unemployed, and much less likely to have a high school diploma. Hispanic mothers are also less likely to be married than white or Asian mothers, though black mothers are the least likely to be married. Hispanic mothers are less likely to be born in the U.S relative to White and Black mothers, and Hispanic families have lower incomes than White or Asian families. With the exception of marital status, all of these differences in family characteristics by race/ethnicity suggest that Hispanic families should be less likely to use center care. As discussed in Chapter III, being unemployed, having low education, being foreign-born and having a low family income have each been shown in the literature to be related to lower rates of center care use.
Table 5.1. Sample Distribution, by Characteristics (Weighted Percentages)

<table>
<thead>
<tr>
<th>Age of Child</th>
<th>Hispanic</th>
<th>White</th>
<th>Black</th>
<th>Asian/Pacific Islander</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 1 Year</td>
<td>17</td>
<td>14</td>
<td>19</td>
<td>17</td>
</tr>
<tr>
<td>1 to 2 Years</td>
<td>38</td>
<td>44</td>
<td>35</td>
<td>43</td>
</tr>
<tr>
<td>3 to 5 Years</td>
<td>45</td>
<td>43</td>
<td>46</td>
<td>41</td>
</tr>
<tr>
<td>Maternal Employment Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Employed</td>
<td>63</td>
<td>51</td>
<td>48</td>
<td>46</td>
</tr>
<tr>
<td>Part-time</td>
<td>11</td>
<td>21</td>
<td>22</td>
<td>12</td>
</tr>
<tr>
<td>Full-time</td>
<td>26</td>
<td>28</td>
<td>29</td>
<td>42</td>
</tr>
<tr>
<td>Maternal Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than High School</td>
<td>53</td>
<td>10</td>
<td>23</td>
<td>0</td>
</tr>
<tr>
<td>High School Graduate</td>
<td>23</td>
<td>16</td>
<td>33</td>
<td>4</td>
</tr>
<tr>
<td>Some College</td>
<td>19</td>
<td>34</td>
<td>37</td>
<td>43</td>
</tr>
<tr>
<td>College Graduate</td>
<td>4</td>
<td>22</td>
<td>7</td>
<td>40</td>
</tr>
<tr>
<td>Beyond College</td>
<td>1</td>
<td>18</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>Marital Status</td>
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<td></td>
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<tr>
<td>Married</td>
<td>63</td>
<td>82</td>
<td>23</td>
<td>91</td>
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<tr>
<td>Cohabitating</td>
<td>16</td>
<td>11</td>
<td>16</td>
<td>6</td>
</tr>
<tr>
<td>Single</td>
<td>20</td>
<td>7</td>
<td>61</td>
<td>3</td>
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<tr>
<td>Mother's Nativity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.S. Born</td>
<td>29</td>
<td>82</td>
<td>81</td>
<td>16</td>
</tr>
<tr>
<td>Foreign Born</td>
<td>71</td>
<td>18</td>
<td>19</td>
<td>84</td>
</tr>
<tr>
<td>Family Income (Actual Response)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than $20,000</td>
<td>44</td>
<td>17</td>
<td>57</td>
<td>6</td>
</tr>
<tr>
<td>$20,000 to $39,999</td>
<td>24</td>
<td>11</td>
<td>16</td>
<td>18</td>
</tr>
<tr>
<td>$40,000 or higher</td>
<td>19</td>
<td>56</td>
<td>21</td>
<td>57</td>
</tr>
<tr>
<td>Missing</td>
<td>13</td>
<td>16</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>Family Income (with Imputation for Missing)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than $20,000</td>
<td>55</td>
<td>18</td>
<td>60</td>
<td>7</td>
</tr>
<tr>
<td>$20,000 to $39,999</td>
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<td>14</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>$40,000 or higher</td>
<td>20</td>
<td>68</td>
<td>22</td>
<td>75</td>
</tr>
<tr>
<td>Unweighted # of Observations</td>
<td>589</td>
<td>154</td>
<td>59</td>
<td>64</td>
</tr>
</tbody>
</table>

The findings for the relationships between other family characteristics and use of child care are similar to those found in the literature. Younger children are more likely to be in parental care, and less likely to be in center care. The employment status of the mother is strongly related to type of care used, with employed mothers more likely to use all types of formal care and less likely to use parental care. Highly educated mothers are much less likely to use relative care, and more likely to use non-relative care. Interestingly, it is not the most highly educated mothers, but mothers with some college
education that are most likely to use center care. Again, the lack of significance for the higher levels of education may be due to relatively small sample sizes. However, the similarly large odds ratios indicate that women with at least some college education are more than 2 times as likely to use center child care. Single women are less likely to use parental care (likely because of the lack of a father to contribute and the need for these women to work), but there is no relationship between marital status and use of relative or center care. I find no significant relationship between nativity and use of child care, or family income and use of care for the full sample of children ages 0 to 5.

It is important to highlight here that the findings for employment status of the mother, as I previously discussed that this in many ways approximates primary access to parental care. The odds ratios are large and highly significant for all types formal care, and small and highly significant for parental care. It is clear that not having a mother in the home all day (and therefore not having full primary access to the mother) leads to much greater use of all forms of formal child care. Because of this large significant relationship, it is crucial to control for employment status to avoid bias from omitting this critical variable, even if it is possible (and likely) that this variable is endogenous.

Later analyses in this study limit the populations examined to those that qualify for publicly funded child care. These samples are determined by the income restrictions presented in Table 4.1. It is important to examine the results for these populations, because they may have somewhat different relationships between child and family characteristics and use of child care. Table 5.3 provides the odds-ratios for use of center care for these restricted populations (with the exception of family income, where marginal effects per $10,000 are reported). The first column shows the results for
children qualifying as in poverty according to reported family income. However, as mentioned previously, the loss of so many observations is believed to potentially bias the results, so for most of the analyses we impute income for the respondents not reporting income. The second column uses imputed income to recalculate these results for children in poverty. The third column shows results for families qualifying for CDE child care or preschool.

### Table 5.2. Type of Child Care Used by Family and Child Characteristics (Odds-Ratios)

<table>
<thead>
<tr>
<th></th>
<th>Parental Care</th>
<th>Relative Care</th>
<th>Nonrelative</th>
<th>Center Care</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Hispanic</td>
<td>2.07*</td>
<td>0.58</td>
<td>1.08</td>
<td>0.52</td>
</tr>
<tr>
<td>Black</td>
<td>1.93</td>
<td>0.47</td>
<td>0.79</td>
<td>0.98</td>
</tr>
<tr>
<td>Asian</td>
<td>1.13</td>
<td>2.22</td>
<td>0.72</td>
<td>0.43</td>
</tr>
<tr>
<td><strong>Age of Child</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 1 Years</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>1 to 2 Years</td>
<td>0.27***</td>
<td>1.64</td>
<td>2.17*</td>
<td>5.35**</td>
</tr>
<tr>
<td>3 to 5 Years</td>
<td>0.33***</td>
<td>0.85</td>
<td>1.13</td>
<td>11.90***</td>
</tr>
<tr>
<td><strong>Maternal Employment Status</strong></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Not Employed</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Part-time</td>
<td>0.15***</td>
<td>3.79***</td>
<td>4.44***</td>
<td>3.31***</td>
</tr>
<tr>
<td>Full-time</td>
<td>0.07***</td>
<td>9.84***</td>
<td>5.38***</td>
<td>2.95***</td>
</tr>
<tr>
<td><strong>Maternal Education</strong></td>
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<td></td>
</tr>
<tr>
<td>Less than High School</td>
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<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>High School Graduate</td>
<td>1.45</td>
<td>0.72</td>
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<tr>
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<td>0.67</td>
<td>1.16</td>
<td>0.60</td>
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<td>College Graduate</td>
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<td>1.05</td>
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<tr>
<td>Beyond College</td>
<td>0.85</td>
<td><strong>0.12</strong>*</td>
<td>2.46*</td>
<td>2.15</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Cohabitating</td>
<td>0.82</td>
<td>1.33</td>
<td>1.22</td>
<td>0.82</td>
</tr>
<tr>
<td>Single</td>
<td>0.55*</td>
<td>1.63</td>
<td>1.90</td>
<td>0.88</td>
</tr>
<tr>
<td><strong>Mother's Nativity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.S. Born</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Foreign Born</td>
<td>1.33</td>
<td>0.88</td>
<td>1.11</td>
<td>0.60</td>
</tr>
<tr>
<td><strong>Family Income (w/ Imputations)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than $20,000</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>$20,000 to $39,999</td>
<td>1.53</td>
<td>0.71</td>
<td>1.07</td>
<td>0.57</td>
</tr>
<tr>
<td>$40,000 or higher</td>
<td>1.13</td>
<td>0.59</td>
<td>1.88</td>
<td>0.70</td>
</tr>
<tr>
<td><strong># of Children Using</strong></td>
<td>537</td>
<td>134</td>
<td>96</td>
<td>99</td>
</tr>
</tbody>
</table>

* represents significance at the 10% level, ** represents significance at the 5% level, *** represents significance at the 1% level
The results for these various populations of interest are almost identical to those for the entire sample. Age and the employment status of the mother are predictive of center care use, though the relationship for part-time employment is no longer significant in these smaller samples. As in the full sample, mothers with some college education are
more likely to enroll their children in center care. Again, the lack of relationship for higher levels of education is likely due to sample size issues. While there are 71 children with mothers in the “some college” category for the analysis of children qualifying for federal poverty status (including imputed income), there are only 20 children with mothers in the “college degree” category, and only 3 with mothers in the “more than college degree” category.

It is also important to look at the results by family characteristics for children ages 2 to 5 in these various populations of interest, as the analyses for access focus on these children. The populations in these samples are obviously somewhat smaller, so there is not enough power to detect the significance of small relationships. There also may be differences in the relationships between family characteristics and use of center care for older children than for all children ages 0 to 5. Table 5.4 presents the results of these analyses. In the analyses for children ages 2 to 5, the child’s age is entered as a continuous variable. As a result, marginal effects are now presented for both age and family income rather than odds ratios (with the exception of the full sample of children ages 2 to 5, which has family income entered as a categorical variable).

Similar to the analyses for children ages 0 to 5, mothers who are employed full-time are more likely to use center care. Mothers employed part-time are also more likely to use center care in the full samples for both the 0 to 5 and 2 to 5 analyses. One explanation for why this relationship may not appear in the analyses of children qualifying for publicly subsidized care is that the relationship may be driven by relatively high-income families where the use of center care or preschool frees up the mother to work part-time. Age is no longer significant in the analyses of children ages 2 to 5. This
may indicate that the relationship for age in the 0 to 5 analyses were primarily driven by
care differences between infants and children ages 2 to 5 rather than differences between
toddlers and preschool-aged children. As seen in the analyses of children 0 to 5
qualifying for publicly funded child care, there is a positive relationship between the
mothers having some college education and center care use. Again, the results are
unreliable for a college degree or greater education because of small sample sizes in these
categories, but it is likely that the relationship between education and center care use
holds for mothers with any education above a high school diploma.

There are several relationships that show up in the analyses of children ages 2 to 5
that are not significant in the 0 to 5 analyses. For children in families that qualify for
federal poverty status, those that have married mothers are significantly more likely to
use center care. This is in contrast to previous studies that have shown single mothers to
be more likely to use care (Crosnoe, 2007; Radey & Brewster, 2007). These results may
be driven by the tendency for many centers to provide only half-day care, or to provide
care only during typical work hours. Single mothers may have to use a child care
provider that is more flexible. Analysis of relative and non-relative care (for those in
column II, children in poverty including imputed income) indicate that children with
single mothers are more likely to be in these types of care.
Table 5.4. Use of Center Child Care for Various Populations of Interest, Child and Family Characteristics (Ages 2 to 5)

<table>
<thead>
<tr>
<th></th>
<th>Income-Reporting</th>
<th>With Imputed Incomes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Families that</td>
<td>Families that</td>
</tr>
<tr>
<td></td>
<td>Qualify for All</td>
<td>Qualify for All</td>
</tr>
<tr>
<td></td>
<td>PPCC</td>
<td>PPCC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.27</td>
<td>0.73</td>
</tr>
<tr>
<td>Black</td>
<td>0.76</td>
<td>0.75</td>
</tr>
<tr>
<td>Asian</td>
<td>0.17</td>
<td>2.64</td>
</tr>
<tr>
<td><strong>Age of Child</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 1 Years</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1 to 2 Years</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3 to 5 Years</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Maternal Employment Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Employed</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Part-time</td>
<td>0.59</td>
<td>2.04</td>
</tr>
<tr>
<td>Full-time</td>
<td>2.69*</td>
<td>2.16</td>
</tr>
<tr>
<td><strong>Maternal Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than High School</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>High School Graduate</td>
<td>2.48</td>
<td>1.25</td>
</tr>
<tr>
<td>Some College</td>
<td>5.70**</td>
<td>3.62*</td>
</tr>
<tr>
<td>College Graduate</td>
<td>29.05**</td>
<td>1.11</td>
</tr>
<tr>
<td>Beyond College (a)</td>
<td>0.30</td>
<td>0.43</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Cohabitating</td>
<td>0.08**</td>
<td>0.09**</td>
</tr>
<tr>
<td>Single</td>
<td>0.19**</td>
<td>0.50</td>
</tr>
<tr>
<td><strong>Mother's Nativity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.S. Born</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Foreign Born</td>
<td>0.19***</td>
<td>0.20**</td>
</tr>
<tr>
<td><strong>Family Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than $20,000</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>$20,000 to $39,999</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>$40,000 or higher</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Unweighted # of Observations</strong></td>
<td>208</td>
<td>249</td>
</tr>
</tbody>
</table>

* represents significance at the 10% level, ** represents significance at the 5% level, *** represents significance at the 1% level; (a) odds-ratios for this category unreliable for public child care analysis because only 1 child in this cell.

Another interesting finding for children ages 2 to 5 is the significant negative relationship between having a foreign-born mother and use of center care. This association is large and significant for each of the analyses, but seems to be particularly large for children in poverty. A negative relationship between immigration status and use
of center care has been found in previous studies (Brandon, 2004; Crosnoe, 2007). Because these analyses control for income and the education and employment status of the mother, differences in SES by immigration status cannot be driving this relationship. These immigrant mothers may be less likely to use care for a variety of reasons, including lesser access to information on center providers due to limited social networks, fear of using public services due to immigration concerns, or differences in preferences.

Finally, in several of these analyses of children ages 2 to 5, the association between income and use of center care becomes significant. While the relationship between income and use of center care is positive for children in poverty (and insignificant when imputed income observations are included), the relationship is negative for those who qualify for CDE, and non-significant when looking at all families. Fuller et al. (1996) argued that the relationship between income and use of center care may be U-shaped, with low- and high-income families more likely to use care than those in the middle-income range. These results would support this assumption. The positive relationship between income and use of center care for those in poverty may be driven by a SES effect (whereby families with greater resources may have greater access to informational resources, more time to research child care options, or different preferences), because price is not a factor, since all of these families qualify for free child care under Head Start and other public programs. For the families qualifying for publicly subsidized CDE, on the other hand, this care is not necessarily free for families above the Federal Poverty income, and costs increase with family income. This is likely to be driving the negative income effect, in which the poorest families have higher access to
free publicly subsidized care, yet price (and potentially access) may be an important issue for middle-income families and restrict use of center care.

Having looked at the relationships between child and family characteristics and use of various types of child care, it is clear that controls for these characteristics are necessary in examining racial/ethnic differences in child care use, because there are significant differences, particularly between Hispanic families and white families. I now move on to my analyses of primary access to relatives and centers, and the relationship between this access and use of these types of care. The next chapter discusses primary access to relatives and use of relative and center care.
Chapter VI. Relative Access and Use of Relative/Center Care

As discussed in Chapter III, the literature on Hispanic use of relative care is mixed when controlling for family characteristics. Table 5.2 showed that Hispanics are no more likely to use relative care. Figure 6.1 presents the types of care used by families that are using some type of formal (non-parental) care. These results indicate that without controlling for family characteristics, Asian and Pacific Islander children are more likely to use relative care when compared to White children. Hispanic children may also be more likely to use relative care when compared to White children, yet while these differences are large, they are not quite statistically significant (p-value=0.11). Because only 30% of Hispanic children are using any sort of formal child care, this lack of statistical significance may be the result of relatively small sample sizes. However, Table 5.2 demonstrated that the greater likelihood of Hispanic families to use relative care is completely explained by differences in family characteristics.

In addition to differences in SES, greater access to relatives has also been argued as a potential reason for greater use of relative care among Hispanic families (Capizzano et al., 2006; Hofferth & Wissoker, 1992). Figure 6.2 shows that families of Hispanic children in Los Angeles County do have significantly greater access to relatives in the home or neighborhood relative to White and Asian/Pacific families. Nearly half of all Hispanic families have a relative living in the home, and at least 22% have a relative in the neighborhood. It seems that if availability of relatives is associated with greater use of relative care, Hispanic children would be more likely to use this type of care. However, Liang et al. (2000) found no relationship between the presence of a relative in
the household and use of relative care. The disagreement in the literature and the lack of racial/ethnic differences in relative use for this sample despite widely differing access to relatives suggests that further analysis of this issue would be informative.

**Figure 6.1. Use of Non-Parental Care by Race/Ethnicity**

![Bar graph showing use of non-parental care by race/ethnicity.](image)

Note: The difference between White and Asian use of relative care is the only significant difference (p=0.035). The p-value for the difference between Hispanic and White use of relative care is 0.11.

Table 6.1 presents the results of a binomial logistic regression of use of relative and center care that examines the relationship with access to relatives and use of care. All of these analyses control for the child and family characteristics in Tables 5.2 through 5.4 and include the full sample of children ages 0 through 5. These results in column 1 confirm previous findings that families with a relative in the home are nearly twice as likely to use relative care. However, there does not appear to be a significant positive relationship between the presence of a relative in the neighborhood and use of relative
The fact that nearly half of the observations are missing data on relatives in the neighborhood may be contributing to this lack of significance. There is also no relationship between access to relatives in the home and use of center care.

Figure 6.2. Access to Relatives in the Home or Neighborhood by Race/Ethnicity

* Note: Nearly half of families had missing data for whether or not relatives lived in the neighborhood. These families are assumed to have no relatives in the neighborhood for the purposes of this table.

The finding of a positive relationship between access to relatives and use of relative care seems to conflict with the results from Table 5.2 that shows Hispanic families to be less likely to use relative care. It was important, therefore, to explore the possibility that there might be different relationships between access to relatives and use of relative care by ethnicity that are leading to this lack of ethnic differences in relative care use. Columns 3 and 5 model the relationships between access to relatives and use of relative/center care separately for Hispanic and non-Hispanic families. These results
indicate that non-Hispanic families with a relative in the home are more than three times as likely to use relative child care, while there is no significant relationship between access to relatives and use of relative care among Hispanics. Contrary to Fuller et al. (1996), I also find no relationship between access to relatives and use of center care, even when allowing for separate relationships by ethnicity.

<table>
<thead>
<tr>
<th>Relative in Home x Non-Hispanic</th>
<th>Relative Care</th>
<th>Center Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative in Home</td>
<td>1.89**</td>
<td>0.90</td>
</tr>
<tr>
<td>Relative in Neighborhood</td>
<td>-</td>
<td>1.41</td>
</tr>
<tr>
<td>Relative in Home x Hispanic</td>
<td>-</td>
<td>3.12**</td>
</tr>
</tbody>
</table>

These results suggest that greater access to relatives in the home is not a primary cause of the lower use of center care among Hispanics. Despite greater access to relatives, Hispanics in Los Angeles County are no more likely to use relative care. The relationship between access to a relative in the home and use of relative care is positive and significant, but when separate effects are allowed for Hispanics and non-Hispanics, this relationship holds only for non-Hispanic families. It may be that the tendency of Hispanic relatives to live in the home is driven by cultural factors and/or economic considerations that are unrelated to decisions about child care. The lack of a significant relationship between relative access and use of center care strengthens this conclusion that relative access is not a primary factor in determining child care use among Hispanic
families in Los Angeles County. Having concluded that primary access to relatives is not a major cause of racial/ethnic differences in use of center care, the next chapter examines the potential role of primary access to center child care.
Chapter VII. Access to Center Care in Los Angeles County

While greater access to relatives cannot be the primary explanation for lesser use of center care among the Hispanic population in Los Angeles County, it may be that there are fewer affordable centers in Hispanic neighborhoods, and that it is this lack of primary access to center care that is contributing to these lower rates of use. This chapter examines the access of children in Los Angeles County to all publicly subsidized care, CDE preschools and child care centers, and all child care centers, whether public or private, to determine whether Hispanic neighborhoods have lesser access to center care. There is also analysis of access to Spanish-speaking providers, as the use of Spanish in centers may be an important factor in the decision to use care (or the ability of parents to access the care) for many Hispanic families.

Distribution of Hispanic Children in Los Angeles County

In many relatively urban counties throughout the United States, communities and neighborhoods are often highly segregated by race/ethnicity. Figure 7.1 shows the distribution of Hispanics across Los Angeles County. Census tracts in this figure (and census block groups in later analysis) are divided into three categories: tracts with low concentrations of Hispanic children, meaning that less than one-third of children ages 0 to 5 in the neighborhood are Hispanic; medium concentrations of Hispanic children, meaning that one-third to two-thirds of children ages 0 to 5 in the tract are Hispanic; and highly concentrated Hispanic neighborhoods, where more than two-thirds of children ages 0 to 5 are Hispanic. According to the figure, there are relatively few Hispanic children as a percentage of the population along the coast, and significantly greater
concentrations in the South-Central and East Los Angeles portions of the county. There is also a large portion of the San Fernando Valley (located in the middle-western portion of the figure) where there are highly concentrated Hispanic populations. Some of the more rural north-eastern portions of the county (called the Antelope Valley) also have moderate to high concentrations of Hispanic children.

The graphical representations in this chapter are presented for census tracts, because census block groups are so small that it is difficult to discern between the various block groups. However, the analysis of access to child care is done at the census block group level. Table 7.1 presents the summary statistics for census block groups by the concentration of Hispanic children in the neighborhood. Thirty-six percent of census block groups fall in the low Hispanic concentration category, while 26% fall in the medium category and 38% fall in the high category. As the table indicates, census block groups with high percentages of Hispanic children have significantly greater populations of children overall. It may be that these census block groups have larger overall populations (since the total populations within a census block group can range from 600 to 3000 people), but it may also be that children ages 0 to 5 are a larger portion of the overall census block population. Either way, these highly concentrated census block groups are likely to need more child care centers and/or more slots within each center in the area to service these larger populations.

In addition to the statistics on total number of census blocks and average child populations between the ages of 0 and 5, Table 7.1 presents the average percentages of children in each category of block groups that are estimated to qualify for various types of public care. As previously mentioned, the income qualification for Head Start centers
is Federal Poverty Status, and the exact number of children in poverty between 0 and 5 is provided in the census data, so these percentages are not estimates. These figures show that in highly concentrated Hispanic neighborhoods, more than three times as many children (nearly a third of all children) qualify for Federal Poverty Status relative to neighborhoods with low concentrations of Hispanics. Nearly a quarter of children in moderately concentrated Hispanic neighborhoods qualify for Federal Poverty Status.

Figure 7.1. Concentration of Hispanics Among Children Ages 0 to 5 in Los Angeles County

![Figure 7.1. Concentration of Hispanics Among Children Ages 0 to 5 in Los Angeles County](image)
Table 7.1 also presents estimates of children qualifying for publicly subsidized CDE preschool or child care. As mentioned in Chapter IV, there are two alternative calculations used for these estimates. The first assumes all families with incomes less than $40,000 to qualify for federally subsidized CDE care, while the second uses the average family size in each census block group to adjust the estimates. However, the average percentage of children qualifying for CDE is relatively similar across both measures. Overall, approximately twice as many children in Los Angeles qualify for CDE relative to Head Start. Thirty percent of children in neighborhoods with low Hispanic concentrations, 50 percent of children in neighborhoods with medium Hispanic concentrations, and 60 percent of children in neighborhoods with high Hispanic concentrations qualify for CDE care that is subsidized to some degree by the California government.

<table>
<thead>
<tr>
<th>Hispanic Concentration</th>
<th>Number of Children Ages 0 to 5</th>
<th>Percent of Children in Poverty</th>
<th>Percent of Children Qualifying for CDE</th>
<th>Percent of Children Qualifying for CDE*</th>
<th># of Census Blocks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>154</td>
<td>9.25</td>
<td>31.92</td>
<td>28.41</td>
<td>2,213</td>
</tr>
<tr>
<td>Medium</td>
<td>232</td>
<td>24.19</td>
<td>52.87</td>
<td>50.86</td>
<td>1,628</td>
</tr>
<tr>
<td>High</td>
<td>270</td>
<td>32.75</td>
<td>61.86</td>
<td>62.35</td>
<td>2,328</td>
</tr>
<tr>
<td>Total</td>
<td>233</td>
<td>25.03</td>
<td>52.55</td>
<td>51.44</td>
<td>6,169</td>
</tr>
</tbody>
</table>

* Census block CDE eligibility weighted by average family size to reflect eligibility income requirements that vary by family size.
Low = 0 to 33.33% Hispanic, Medium = 33.34 to 66.67%, High = 66.67 to 100%.
Averages are weighted by: population in census block/total population in concentration range.

As mentioned, the greater overall number of children in heavily Hispanic neighborhoods is likely to mean a higher overall demand for child care, whether this child care is provided through centers or other types of child care providers. Therefore, for these neighborhoods to have equal access to center child care, there must be a greater number of center slots to make the ratio of slots per 100 children equivalent. In addition,
the significantly greater number of children qualifying for publicly subsidized care in highly concentrated Hispanic neighborhoods means that there must be many more publicly funded centers and/or slots within each publicly funded center to meet this additional (potential) demand if these neighborhoods are going to have sufficient access to center child care (with sufficient meaning equal to those in other neighborhoods). The next section of this chapter addresses this access to center care.

**Access to Publicly Funded, CDE and All Centers**

This section examines three separate levels of access: access of children in poverty to all forms of publicly subsidized care, access of children qualifying for CDE to CDE preschool and child care, and access of all children to all center care. Separate results are also presented for children ages 0 to 5 and ages 2 to 5. However, the primary area of interest is the access of children in poverty ages 2 to 5 to publicly funded slots for children ages 2 to 5. There are several reasons for this. One of the arguments for focusing on children in poverty is that as discussed in Chapter III, there are reasons to believe that high-quality child care may be able to provide the greatest benefits to children in low-income families. In addition, while almost all publicly funded center care is likely to be free for children in poverty, the same may not be true for many of the children qualifying for publicly subsidized CDE centers, so the effect of costs on primary access are more likely to be minimal or irrelevant for these populations. On the supply side, restricting the analysis to publicly funded centers rather than all center care ensures at least some minimal level of quality, as Head Start and CDE programs have restrictions on provider education and training as well as adult to child ratios. Finally, there are
specific reasons for the focus on children ages 2 to 5. Only around 5 percent of center
child care slots are reserved for children under the age of 2, so variation in number of
children ages 0 to 1 across neighborhoods is likely to drive the majority of variation in
access statistics. In addition, some may argue that if there is already a lack of publicly
funded center child care and preschool resources available, the focus should be on older
children rather than children under the age of 2.

Figure 7.2 presents a map of access for children in poverty to publicly funded
child care. These access statistics are obtained through the two-step floating catchment
method described in Chapter IV that assumes a 10-minute buffer zone. This visual
representation of access indicates that the greatest access to federally funded center care
for children in poverty is in the central coast area (around Santa Monica) and the central
Los Angeles (stretching east into the San Gabriel Valley). When compared to Figure 7.1,
these are not necessarily the areas with the highest concentrations of Hispanic children,
however, the areas of highly concentrated Hispanic neighborhoods do tend to be in the
range of 20 to 30 publicly funded center slots per 100 children in poverty (with the
exception of some of the northern, more rural census tracts). Figure 7.2 does not seem to
indicate that highly concentrated Hispanic neighborhoods have particularly high or
particularly low access to publicly funded child care. Statistical averages of access
statistics will be able to better identify small regional differences in access by Hispanic
concentration of neighborhoods.
Table 7.2 provides population-weighted averages of access statistics in census block groups across Los Angeles County. Before making relative comparisons across neighborhoods by Hispanic concentration and across various population groups, it is useful to compare the overall child care availability ratio (13.62 slots per 100 children ages 0 to 5 and 18.99 per 100 children ages 2 to 5) to ratios that are observed in areas across the country. In 2008, Indiana had an average of 22.7 licensed child care slots per 100 children between the ages of 0 and 4 (Annie E. Casey Foundation, 2009). However,
this ratio includes licensed family care slots in supply and only children ages 0 to 4 in demand, so would be expected to be somewhat higher than the ratio of center slots per 100 children ages 0 to 5. Fuller et al. (2002) looked specifically at the 200 poorest zip codes in California, and found an average of 10 licensed slots per 100 children in Los Angeles County, as well as 17 slots per 100 children in Alameda County and 5 slots per 100 children in Merced County. Several other states consider licensed child care slots per 100 children between the ages of 0 and 13 and find ratios of 15 per 100 in Washington (Miller & Hu, 2000) and 17 per 100 in Oregon (Oregon Employment Department, 2009). The only study that uses the exact same method with the exact same population (ages 0 to 5) finds an average of 19 slots per 100 children in Chicago (Goerge et al., 2007). While it is somewhat difficult to compare these ratios with somewhat different populations included in supply and demand, the ratios of 13 and 19 slots per 100 children found in this study appear to be relatively consistent with those reported across the country, indicating that Los Angeles County does not appear to have a particularly great shortage (or surplus) of licensed child care slots.

<table>
<thead>
<tr>
<th>Hispanic Concentration</th>
<th>Children in Poverty to All Public Slots</th>
<th>Children Qualifying for CDE to CDE Slots</th>
<th>All Children to All Slots</th>
<th># of Census Blocks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ages to 0</td>
<td>13.14</td>
<td>3.72</td>
<td>15.59</td>
<td>2,213</td>
</tr>
<tr>
<td>Low</td>
<td>18.41</td>
<td>5.20</td>
<td>21.68</td>
<td>2,174</td>
</tr>
<tr>
<td>Medium</td>
<td>20.09</td>
<td>6.06</td>
<td>19.57</td>
<td>1,622</td>
</tr>
<tr>
<td>High</td>
<td>21.81</td>
<td>7.16</td>
<td>17.44</td>
<td>2,316</td>
</tr>
<tr>
<td>Total</td>
<td>20.56</td>
<td>6.41</td>
<td>18.99</td>
<td>6,112</td>
</tr>
</tbody>
</table>

* Census block CDE eligibility weighted by average family size to reflect eligibility income requirements that vary by family size. All differences are significant at the p=0.01 level. Low = 0 to 33.33% Hispanic, Medium = 33.34 to 66.67%, High = 66.67 to 100%. Averages are weighted by: population in census block/total population in concentration range.
As previously mentioned, there are somewhat fewer spots available for children ages 0 to 1, so it is not surprising that the ratios for the full sample of children ages 0 to 5 are somewhat lower. These findings mirror those in Samu and Muranaka (2000) that show fewer slots per 100 children for younger populations in Los Angeles County. However, the relative ratios across the various types of access populations are consistent between the two age groups. The access of children in poverty to all publicly funded slots is 1 to 1.5 slots per 100 children higher than the access of all children to all slots. However, both of these ratios can be somewhat misleading. The ratio of children in poverty to all public slots somewhat overestimates true primary access to these slots because it does not take into consideration the children with higher family incomes that are still able to qualify for CDE center slots. The ratio of all children to all slots may also significantly overestimate primary access, because for poorer children, the costs of some of these centers may make them inaccessible. Similarly, the CDE access ratios may be underestimated somewhat, because all children in poverty are considered potential demand for these slots, while the other non-CDE publicly funded centers (like Head Start) are not considered on the supply side of the ratio. For these reasons, it is not really practical to compare ratios across these various population groups.

On the other hand, these issues that lead to overestimation and underestimation within a single access ratio population should not as great of an effect on the relative comparisons between neighborhoods of varying Hispanic concentrations, the primary comparison of interest in this study. The averages for neighborhoods with low, medium and high Hispanic concentrations indicate that low-income families in highly concentrated Hispanic neighborhoods actually have the greatest access to publicly funded
care, whether looking at families in poverty to all publicly funded centers, or families that qualify for CDE to CDE centers. Low-income families in neighborhoods with medium concentrations of Hispanic families also have higher access to publicly funded center care relative to neighborhoods with few Hispanic families. All of these differences are significant at the p=0.01 level. On the other hand, when looking at the access of all children to all publicly funded slots, the relationship is reversed. Children in neighborhoods with low concentrations of Hispanic children have the greatest access to all centers, while neighborhoods that are heavily Hispanic have the lowest access to all centers.

**Sensitivity Analysis of Access to Publicly Funded Centers**

All of the access statistics presented in the previous section use a driving distance buffer zone of ten minutes to approximate the reasonable distance that a family would be willing to drive in each direction to take a child to a child care center. This is the buffer zone used in the study on which the methods for this study are drawn, as the distance California parolees would be willing and able to drive to access health care services (Davis et al., 2009). However, there are certainly arguments for smaller or larger buffer zones. There are likely parents who would be willing to travel 15 minutes or more in each direction to ensure that their child was able to attend the child care provider that is most desirable to them. This may be particularly true for families with unemployed mothers or other relatives living in the household, as time may not be as much of a constraint for these families. On the other hand, for low-income families that have limited access to transportation and/or busy work schedules, 5 minutes driving time may
be a more reasonable approximation for a buffer zone encompassing centers that a family has primary access to. Finally, because the travel times for this analysis are based on posted speed limits, it may be reasonable to assume that travel times will be somewhat longer in areas with significant traffic.

Table 7.3 presents the buffer zone sensitivity analysis of access statistics for children ages 2 to 5 in poverty to all publicly funded center slots. These results indicate that the level of the buffer zone is extremely important in determining whether neighborhoods with high Hispanic concentrations have greater or lesser access to center care. When the buffer zone is 5 minutes, poor families in neighborhoods with relatively few Hispanic children have much greater access to publicly funded center care, while poor families in neighborhoods with medium and high concentrations have similar access. The initial 10-minute buffer zone showed that the higher the concentration of Hispanics in the census block group, the greater the access of poor families to publicly funded center care (a premium of 3.4 extra slots per 100 children when comparing high to low Hispanic neighborhoods). When the buffer zone is 15 minutes, this relationship is even stronger, with heavily Hispanic neighborhoods averaging more than 5 slots per 100 children more than neighborhoods with few Hispanic children.

These results indicate that neighborhoods with relatively few Hispanic children tend to have significantly greater access to child care centers that are very close in location relative to their access at moderate to far distances. Access remains somewhat more similar for neighborhoods with medium to high concentrations of Hispanic families. Because it is difficult to argue the absolute superiority of any one buffer zone distance,
the analysis of the relationship between access and use in Chapter VIII includes sensitivity analysis that considers all three buffer zones.

<table>
<thead>
<tr>
<th>Hispanic Concentration</th>
<th>5 Minute Travel Time Buffer</th>
<th>10 Minute Travel Time Buffer</th>
<th>15 Minute Travel Time Buffer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>31.39</td>
<td>18.41</td>
<td>15.90</td>
</tr>
<tr>
<td>Medium</td>
<td>21.49</td>
<td>20.09</td>
<td>19.49</td>
</tr>
<tr>
<td>High</td>
<td>21.93</td>
<td>21.81</td>
<td>21.07</td>
</tr>
<tr>
<td>Total</td>
<td>23.98</td>
<td>20.56</td>
<td>19.45</td>
</tr>
</tbody>
</table>

All differences are significant at the p=0.01 level except for the Medium/High neighborhoods in the 5-minute travel time case.
Averages are weighted by: population in census block/total population in concentration range.

Access to Spanish-Speaking Providers

The analysis of access to centers throughout this chapter have included all centers on the supply end of the analysis, regardless of the language spoken by the provider. However, as mentioned in previous chapters, there may be a variety of reasons why Hispanic families would be more likely to use a Spanish-speaking provider. It may be that because the provider does not use Spanish, there is little or no information on this center provided in Spanish, so Hispanic parents that primarily speak Spanish are not able to find out about the center (an issue of secondary access). Or, it may be that Hispanic parents are more likely to trust a provider they are able to speak with extensively. In another area of preferences, it may be that Hispanic parents want their children to be in a bilingual environment (though the opposite argument can also be made, that parents would want their children to be in an English-only environment to strengthen English skills). For these reasons it is also important to look at access of children in Los Angeles County to Spanish-speaking providers.
Table 7.4 provides the access statistics for Spanish-speaking providers, comparing these statistics to the similar analyses that include all providers. The access statistics are provided for children in poverty to publicly funded slots and all children to all slots, using the 2 to 5 age group and the buffer zone of 10 minutes (see Appendix E for 0 to 5 access stats). On the demand side of the equation, all children in the age and income range are included, not just Hispanic children, because there is no strong reason to believe that non-Hispanic families would be less likely to use a center because the provider speaks Spanish. On an absolute level, it is expected that access to Spanish-speaking providers will be somewhat less, as potential supply has decreased while potential demand remains the same. However, there is still significant access of children ages 2 to 5 to Spanish-speaking providers. The loss of public providers that do not speak Spanish only results in a 4.7 slot per 100 children decrease in average access. The effect for all children to all centers is somewhat larger, with an average of 9 fewer Spanish-speaking center slots per 100 children. This reflects the greater likelihood of publicly funded centers to be Spanish-speaking relative to non-publicly funded centers (52% of all centers in Los Angeles County are Spanish-speaking, compared to 70% of publicly funded centers).

<table>
<thead>
<tr>
<th>Hispanic Concentration</th>
<th>Children in Poverty to Spanish Provider Public Slots</th>
<th>Children in Poverty to All Public Slots</th>
<th>All Children to All Spanish Provider Slots</th>
<th>All Children to All Slots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>12.00</td>
<td>18.41</td>
<td>9.13</td>
<td>21.68</td>
</tr>
<tr>
<td>Medium</td>
<td>14.11</td>
<td>20.09</td>
<td>10.20</td>
<td>19.57</td>
</tr>
<tr>
<td>High</td>
<td>16.11</td>
<td>21.81</td>
<td>10.37</td>
<td>17.44</td>
</tr>
</tbody>
</table>

All differences are significant at the p=0.01 level except for the medium/high all children to all Spanish-speaking provider difference. Low = 0 to 33.33% Hispanic, Medium = 33.34 to 66.67%, High = 66.67 to 100%. Averages are weighted by: population in census block/total population in concentration range.
The variation between neighborhoods with different concentrations of Hispanic children is somewhat different when looking at access to Spanish-speaking centers. While access to all publicly funded centers was initially larger for neighborhoods with high concentrations of Hispanic children, the access advantage of these heavily Hispanic neighborhoods is even greater when looking at Spanish-speaking providers. In the analysis of access of all children to all slots, Table 7.2 showed that neighborhoods with low concentrations of Hispanic children had the greatest access to all center providers (public and private). However, when looking at Spanish-speaking providers, the direction of this relationship changes. Moderate to heavily Hispanic-populated neighborhoods now have slightly greater access relative to neighborhoods with few Hispanic children. These findings of greater access to Spanish-speaking providers in neighborhoods with more Hispanics are to be expected, because Spanish-speaking providers should be more likely to locate in areas where the population they serve is more likely to speak Spanish. However, these findings are important because they show that a lack of access to Spanish-speaking providers is an unlikely explanation for the lesser use of centers by Hispanic children. The relationship between language and use of center care is further explored in Chapter IX.
Chapter VIII. Access to Centers and Use of Center Care

The results of the previous chapter indicate that low-income families in Hispanic neighborhoods do not have lesser access to publicly funded center care. It is unlikely, therefore, that lesser access to center care is responsible for any part of the ethnic differences in center care use. However, it is still important to look at the relationship between access to center care use and use of center care for individuals in Los Angeles. As Los Angeles County children were shown to have smaller (and for the most part insignificant) ethnic differences in center care use, primary access to centers may be one of the explanations for this. It may be that the average level of access for neighborhoods with high concentrations of Hispanics is greater than access for other neighborhoods, but that within this category of neighborhoods, families in neighborhoods with somewhat greater access are much more likely to use center care. This chapter combines the data on child care use from the tracts sampled in the L.A.FANS survey to the access data for all of Los Angeles County to examine the relationship between access and use.

Access to Publicly Funded, CDE and All Centers

As described in the methods section, most of the analyses in this chapter include the full set of child and family characteristics as controls to ensure that access is not acting as a proxy for these characteristics. As in the previous section, separate analyses are conducted for children in poverty to all publicly funded slots, children that qualify for CDE to all CDE slots, and all children to all slots. Unlike the overall estimates for the county, I am able to exactly determine whether a family in the L.A.FANS data would
qualify for CDE and/or other publicly funded care because for most families there is data on family size and income. Again, for the 13 percent of families that did not report family income, income had to be imputed, and this income was used both as a control and to determine whether the family qualifies for care. Because there is some error associated with imputation, there may be some families included in the analysis that did not actually qualify for publicly subsidized care (and vice versa).

Table 8.1. Relationship between Access to Centers and Use of Center Care

<table>
<thead>
<tr>
<th>Access</th>
<th>Children in Poverty to All Public Slots</th>
<th>Children Qualifying for CDE to CDE Slots</th>
<th>Children Qualifying for CDE to CDE Slots*</th>
<th>All Children to All Slots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ages 0 to 5</td>
<td>-0.003 (-0.17)</td>
<td>-0.143 (-0.32)</td>
<td>-0.132 (-0.30)</td>
<td>-0.132 (-0.18)</td>
</tr>
<tr>
<td>Ages 2 to 5</td>
<td>0.017 (0.22)</td>
<td>-0.405 (-0.42)</td>
<td>-0.380 (-0.41)</td>
<td>-0.146 (0.20)</td>
</tr>
</tbody>
</table>

Results are marginal effects, numbers in parentheses are standard errors. All models control for all of the child and family characteristics from the Chapter V tables.

The marginal effects for an increase in access at the census tract-level of 1 slot per 100 children on the probability of being in center care are presented in Table 8.1. None of these marginal effects are anywhere close to significant, though most of the coefficients do have a negative sign. So according to these models that include full sets of controls, access statistics calculated with a 10-minute buffer zone, and qualification based on imputed incomes, there is no relationship between access to child care centers and use of center care. Sensitivity analysis in the next section shows that this is not always the case. But for this primary analysis, the results support the conclusion that access to centers is not the cause of lesser use of centers among Hispanics. Even though low-income families in Hispanic neighborhoods have somewhat greater access to
publicly subsidized care, this greater access is not related to any differences in center care use in a positive or negative direction.

**Sensitivity Analysis of Access to Publicly Funded Centers**

There are a number of variations that can be made to the primary model to determine whether the findings of no significant relationship between access to centers and use of center care are robust. As indicated in the previous chapter, access statistics differ significantly for some neighborhoods when the buffer is varied from 5 minutes driving distance to 15 minutes driving distance, so it is important to determine whether using 5-minute and 15-minute buffers lead to significant results. Another concern is that the inclusion of so many control variables in the model with a relatively small sample size may lead to excessively large standard errors that make relationships insignificant. To test whether this is the case, a simplified model can be used that controls only for child race and age as well as of other forms of access, including mother’s employment status and the presence of a relative in the home, as a means of decomposing the variation in use of center care by primary access to all 3 types of care (column II in Table 8.2). Because the primary model of interest in this study is the access of children in poverty ages 2 to 5 to publicly funded centers, the sensitivity analysis is shown for this model.

Model I shows that the positive relationship between primary access to centers and use of center care increases substantially as the buffer zone increases, though none of the relationships are statistically significant. And while simplifying the model specification also leads to somewhat larger marginal effects, these relationships are also non-significant. These results suggest that the relationship between primary access to
centers and use of centers is somewhat sensitive to the buffer zone used and the specification of the model. Similar sensitivity analysis was done for the other populations of interest (those qualifying for CDE, all children) and both age groups, and these sensitivity analyses resulted in no differences in significance from the initial results—all results showed no significant relationship between access to centers and use of center care. It is reasonable to conclude, therefore, that there is no relationship between primary access to center care and use of center care. Regardless of whether or not there is a significant positive relationship, access to center care cannot explain ethnic differences in use of center care because as demonstrated in Chapter VII, low-income families in predominately Hispanic neighborhoods actually have higher access to care.

| Table 8.2. Buffer-Zone Sensitivity Analysis (Varying Model Specification) |
|-----------------------------|------------------|
|                             | I                | II               |
| Access (10 Min)             | 0.017            | 0.091            |
|                             | (0.22)           | (0.30)           |
| Access (5 Min)              | 0.002            | 0.052            |
|                             | (0.08)           | (0.10)           |
| Access (15 Min)             | 0.236            | 0.278            |
|                             | (0.41)           | (0.56)           |
| N                           | 249              | 249              |

Results are marginal effects, numbers in parentheses are standard errors.

I - Controls for all family and child characteristics, family income and age as continuous

II - Controls for child characteristics and mother and relative access variables, family income and age as continuous

**Access to Spanish-Speaking Providers**

Finally, it is useful to examine the relationship between access to Spanish-speaking providers and use of center care, because 75 percent of the sample of children ages 2 to 5 in poverty and 62 percent of the full sample of children ages 2 to 5 are
Hispanic. Table 8.3 presents results from the original model, with imputed incomes and the full set of child and family characteristics. In contrast to the previous models that look at providers regardless of language spoken, this model does show a strong positive effect between access to publicly funded Spanish-speaking providers and use of center care for children in poverty ages 2 to 5. There is no relationship for children 0 to 5 and for access of all children to all Spanish-speaking centers. The middle column tests whether the results for access in the model with children in poverty ages 2 to 5 hold for both Hispanic and non-Hispanic children. The results indicate that the marginal effect of access to publicly funded Spanish-speaking providers on use of center care is only significant for Hispanic children. This strengthens the conclusion that it is truly the language of the provider that is generating the relationship between access to centers and use of centers rather than some unusual distribution of Spanish-speaking providers that leads to an effect that is not present in the models in previous sections that look at providers regardless of language spoken. The next chapter looks at how this relationship between primary access to Spanish-speaking providers and use of center care is related to the primary language spoken by Hispanic families.

<table>
<thead>
<tr>
<th></th>
<th>Children in Poverty to All Public Slots in Spanish Providers</th>
<th>All Children to All Slots in Spanish Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access (Ages 2 to 5)</td>
<td>0.878**</td>
<td>-0.313</td>
</tr>
<tr>
<td></td>
<td>(0.37)</td>
<td>(0.36)</td>
</tr>
<tr>
<td>Access (2-5) x Hispanic</td>
<td>-</td>
<td>0.958**</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>(0.42)</td>
</tr>
<tr>
<td>Access (2-5) x Non-Hispanic</td>
<td>-</td>
<td>0.659</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>(0.64)</td>
</tr>
</tbody>
</table>

Results are marginal effects, numbers in parentheses are standard errors. 
** Represents significance at the 5% level 
All models control for all of the child a
Chapter IX. Language and Use of Center Care

Previous studies have shown that primarily Spanish-speaking parents are less likely to enroll their children in center child care (Hirshberg et al., 2005; Liang et al., 2000). For this study, the language a parent chose to be interviewed in is used to approximate the primary language spoken by the parents of each child. Approximately two-thirds of all parents of Hispanic children ages 0 to 5 chose to interview in Spanish. Figure 9.1 indicates that use of center care does vary significantly by the language used for the interview. Hispanic children whose parents chose to be interviewed in English were only slightly less likely to be enrolled in center care relative to non-Hispanic children, and this difference is not significant. Children whose parents interviewed in Spanish, on the other hand, were much less likely than either group to be in center child care, at a rate of only 4 percent.

However, there are likely to be significant differences in socioeconomic status for families where the primary language spoken in Spanish, so it is critical to control for family characteristics when looking at differences in center care use by language. Table 9.1 shows the relationships between language and center care use among the various populations examined throughout this study. These results indicate that language is a critical factor for each of these populations, confirming the findings of previous studies. It also appears that language plays a somewhat larger role in center care use for low-income families and use of centers by children ages 2 to 5. The greater language effects for low-income families may indicate that the combination of the lack of resources (and information) from being of lower SES and the limitations on resources (particularly
information) from language lead to a multiplicative effect, whereas middle-income and high-income Spanish-speaking parents are still limited by language, but are somewhat able to overcome these barriers because of their greater SES.

**Figure 9.1. Type of Care Used by Ethnicity and Language of Interview**

Given the findings in Chapter XIII about the positive relationship between access to publicly funded Spanish-speaking providers (SSPs) and use of center care among children in poverty between the ages of 2 and 5, it is interesting to explore whether access to Spanish-speaking providers can help to mediate some of this language effect and encourage more of these primarily Spanish-speaking parents to enroll their children in center child care. Table 9.2 adds the Spanish-provider access statistics to the models for children ages 2 to 5 (see Appendix F for age 0 to 5 results). Odds ratios are provided.
for the language variable, while marginal effects are provided for the access variables. The results from columns 1 and 3 indicate that access to Spanish-speaking providers does not mediate the relationship between language and use of center care. Columns 2 and 4 of Table 9.2 also provide a look at whether access to Spanish-speaking centers have a greater effect for Spanish-speaking families. The greater coefficient for Spanish-speaking families suggests a potentially greater association for these families, but a lack of power due to small sample sizes eliminates the ability to test for this difference statistically.

**Table 9.1. Odds Ratios for Use of Center Care by Children with Parents Who Interviewed in Spanish**

<table>
<thead>
<tr>
<th></th>
<th>Ages 0 to 5</th>
<th>Ages 2 to 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children in Poverty</td>
<td>0.14***</td>
<td>0.08***</td>
</tr>
<tr>
<td>Children Qualifying for CDE</td>
<td>0.34**</td>
<td>0.26**</td>
</tr>
<tr>
<td>All Children</td>
<td>0.39*</td>
<td>0.32**</td>
</tr>
</tbody>
</table>

* Represents significance at the 10% level ** Represents significance at the 5% level *** Represents significance at the 1% level. Models control for all child and family characteristics except nativity.

Access to Spanish-speaking providers is relatively great in Los Angeles County, with more than 70% of providers speaking Spanish, yet Spanish-speaking families are still much less likely to use center care. A lack of primary access to Spanish-speaking providers cannot explain the lower rates of center care for these families. It may instead be barriers that prevent these families from learning about these Spanish-speaking providers, or it may be that language represents some fundamental difference in preferences or resources that are not accounted for by the controls for child and family characteristics that are included in these models.
Table 9.2. Access to Spanish-Speaking Centers and the Relationship between Language and Center Care Use

<table>
<thead>
<tr>
<th></th>
<th>Children Ages 2-5</th>
<th>Children in Poverty</th>
<th>All Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spanish Language Interview</td>
<td>0.06***</td>
<td>0.03</td>
<td>0.33**</td>
</tr>
<tr>
<td>Access to SSPs</td>
<td>0.821***</td>
<td></td>
<td>-0.213</td>
</tr>
<tr>
<td>(0.31)</td>
<td></td>
<td>(0.36)</td>
<td></td>
</tr>
<tr>
<td>Access to SSPs for Spanish-Speakers</td>
<td>-</td>
<td>0.905*</td>
<td>-</td>
</tr>
<tr>
<td>Access to SSPs for English-Speakers</td>
<td>-</td>
<td>0.745*</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.52)</td>
<td>(1.33)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.42)</td>
<td>(0.37)</td>
</tr>
</tbody>
</table>

* Represents significance at the 10% level  ** Represents significance at the 5% level  *** Represents significance at the 1% level. Models control for all child and fam
Chapter X. Discussion and Policy Recommendations

The purpose of this study was to isolate some of the potential causes of ethnic differences in the use of center child care and attempt to determine whether or not these factors are significant in leading to these differences in child care use. In particular, the primary goal was to determine whether a lack of primary access, meaning a sufficient number of affordable centers within a reasonable distance from a family’s home, could explain the lesser use of center care among low-income Hispanic families. If low-income Hispanic neighborhoods in Los Angeles were seen to have relatively few publicly funded center slots, and if access was found to be positively associated with use of center care, then new public funding for ECE could be used to provide more center slots in these low-income areas to encourage greater Hispanic use of center care. On the other hand, if low-income families in Hispanic neighborhoods do not have lesser primary access to center care, or if there is no relationship (or a negative relationship) between primary access and center care use, then public ECE funds may be more efficiently used to encourage Hispanic use of center care by other means.

In addition to primary access to center care, I explored two other issues that are potentially relevant to use of center child care among Hispanics. The first is the association between access to relatives and use of relative care. If greater access to relative care is leading to greater use of relative care at the expense of center child care use, policies to expand access to centers and encourage greater center use may be less successful, because there are no public policies that could actively prevent families from using these easily accessible, often free, and potentially preferable sources of child care.
Even policies that make center care more attractive may still not be enough to shift Hispanic families toward greater use of center care if this relationship between access to relatives and use of relative care is strong enough. In this case it may be prudent to consider what aspects of center child care are more beneficial to the child when compared to relative care, and attempt to train relatives or otherwise transfer these superior aspects of center care to relative providers to ensure that Hispanics are receiving the adequate preparation for school and potentially experiencing some of the cognitive benefits that are provided in high-quality centers.

The last issue that was addressed in this study is the relationship between language and use of center care. While previous studies have look at the association between language and center care use, none have been able to explore whether this association is due to a lack of primary access to centers with Spanish-speaking providers, or whether this association is due to other factors, such as the inability of Spanish-speaking families to obtain information on the Spanish-speaking providers in their region, or language acting as a proxy for preferences or other family characteristics that cannot be controlled for through traditional SES variables. If access to Spanish-speaking providers is able to mediate the relationship between language and use of center care, then efforts to provide greater public funding to Spanish-speaking providers may be effective in encouraging greater use of center care among Spanish-speaking families.

Use of Center Care Among Hispanic Families in Los Angeles County

While the Hispanic children in Los Angeles County are somewhat less likely to use center child care relative to black and white children (Figure 5.1), further analyses
indicate that these differences in center care use are explained, for the most part, by child and family characteristics. These results mirror several previous studies that show Hispanics to be no less likely to use center care when controlling for family characteristics (Fuller et al., 1996; Radey & Brewster, 2007). Hispanic mothers are less educated, less likely to be employed, and more likely to be born outside of the U.S., and these family differences are associated with lower use of center care. However, the relationship between ethnicity and use of center care is not always entirely eliminated by the inclusion of controls for child and family characteristics. The relationship does become marginally significant for the full sample of children ages 0 to 5 when age as entered as a continuous rather than categorical variable (p=0.097). The sensitivity of the results to the model used and the low significance of this relationship may be due to the small sample sizes in this study. Given a larger sample size, it may be that the findings are closer to those in the series of other studies that have found Hispanic differences in use of center care despite controls for child and family characteristics (Crosnoe, 2007; Hirschberg et al., 2007; Liang et al., 2000; Singer et al., 1998).

While the evidence for lower rates of center care use is somewhat weak in this sample, the results indicating that Hispanic children are much more likely to be in parental care are strong, with the relationship being strongly significant even when controlling for child and family characteristics. Hispanic mothers are somewhat more likely to be unemployed (63%, versus 51% of white mothers, 48% of black mothers, and 45% of Asian mothers), so the greater availability of Hispanic mothers to provide their own care likely plays an important role in this greater use of parental care. But as Table
5.2 demonstrates, these differences cannot entirely explain these differences in child care use.

The question, therefore, is what is generating these differences in child care use among Hispanic families. Is it greater access to relatives, or primary access to affordable centers within a reasonable distance of the family home? Or maybe it is barriers that limit secondary access, such as difficulties obtaining full information, incompatibility of care with non-traditional work schedules, or difficult enrollment procedures that are the primary cause of these child care patterns of use. Preferences may also play an important role if Hispanic families have different opinions about the proper care providers for their children and the importance of ECE in preparing children for school. It is likely a combination of several factors, but the purpose of this study was to look at the contributions of relative access, primary access to center child care, and language.

Relative Access to Care

Early descriptive analyses indicate that use of relative care is not particularly likely to be crowding out use of center care in this sample. Hispanics who use non-parental care are only slightly more likely to use relative care, and this lesser use of center care is entirely explained by differences in family characteristics. These findings agree with several other recent studies that have shown no differences in use of relative care when controlling for family characteristics (Chyu et al., 2005; Crosnoe, 2007; Hirschberg et al., 2007).

Yet some previous studies with larger national samples do find greater use of relative care among Hispanics (Early & Burchinal, 2000; Hofferth & Wissoker, 1992;
A potential explanation for this greater use of relative care is greater access to relatives in the home (Capizzano et al., 2006; Hofferth & Wissoker, 1992). This study confirms these beliefs that there is a relationship between access to a relative in the household and the use of relative care, as children with relatives in the home are nearly twice as likely to use relative care (odds ratio of 1.89). However, this leads to the question why, despite having such greater access to relatives in the household, Hispanics in Los Angeles County are no more likely to use relative care. A model that allows for different relationships between access to relatives and use of relatives by ethnicity provides evidence for this seeming contradiction. While there is a strong significant relationship between access to relatives and use of relative care for non-Hispanic families, this relationship does not hold for Hispanic families. Greater access to relatives does not lead to greater use of relative care among Hispanic families, and cannot, therefore, be a significant factor leading to lower use of center care among these families. For regions similar to Los Angeles County, it would not necessarily be effective to focus resources toward improving relative care or attempting to shift preferences away from relative care, because this is not a major factor driving lesser use of center care in this population.

Primary Access to Child Care Centers in Los Angeles County

While greater access to relatives does not seem to drive ethnic differences in use of center care in Los Angeles County, lesser access to a sufficient number of affordable centers could also have been explaining differences in use of center care. Zucker et al. (2006) found that Hispanic parents in the county were particularly likely to rank location
as an important factor. A previous study found that shortages of child care were particularly likely to be found in two areas of Los Angeles County that had relatively large Hispanic populations (Samu & Muranaka, 2000). Studies in other regions of the country have found lesser primary access to child care center resources in areas with large low-income Hispanic populations (Fuller et al., 1997; Goerge et al., 2007).

However, by employing advanced spatial analysis techniques that allow for a more accurate representation of primary access to center child care, this study finds that low-income families in highly concentrated Hispanic neighborhoods actually have greater access to publicly funded child care. These results are similar to those found in Hirshberg et al. (2005), a study that found Hispanic neighborhoods in three other counties to have somewhat greater access to center child care resources. These findings indicate that California has done a relatively good job of making affordable center providers available in Hispanic regions of Los Angeles County. It is unlikely, therefore, that a lack of primary access to center providers can help to explain lesser use of center care among Hispanic children.

It may actually be the case that this greater primary access is a contributing factor to the weaker (and in most cases, non-significant) relationship between ethnicity and center care that was found in this sample relative to some previous studies. It was therefore important to determine whether there was a relationship between primary access to center providers and use of center child care. The results in this study indicate that there is no relationship (positive or negative) between access to publicly funded centers and use of center care by families in poverty. These findings run counter to those
in Hirshberg et al. (2005) that found a negative relationship between access to center care and use of center care in three California counties.

There is, however, an exception to the lack of relationship between primary access to care and use of care that is found for most populations in this study. There is a significant positive relationship between primary access to publicly funded Spanish-speaking providers and use of center care among children in poverty between the ages of 2 and 5. And because low-income families in highly concentrated Hispanic neighborhoods are also found to have greater access to publicly funded Spanish-speaking providers, this may be an explanation for why the ethnic differences in center care use are not as great in Los Angeles as are large as those in other areas of the country. However, the overall lack of findings of a relationship between access and use of center care for most of the other populations and access statistics indicate that primary access to center care is unlikely to be the primary limiting factor that leads to ethnic differences in center care. Hispanic children in Los Angeles County may still be slightly less likely to use center care, and are definitely more likely to use parental care, and these relationships remain despite greater access to center care for low-income families in Hispanic neighborhoods.

The Role of Language, Use of Center Care, and Access to Spanish-Speaking Providers in Los Angeles County

This study shows a strong relationship between language and center care use, with primarily Spanish-speaking families being only 13 percent to 40 percent (depending on the population) as likely to use center care as their English-speaking counterparts. These
findings support previous studies that have found a similar negative relationship between use of Spanish and use of center care (Hirshberg et al., 2005; Liang et al., 2000). There are many potential explanations for this strong relationship between language and use of center care. Zucker et al. (2006) finds that 23 percent of Hispanics report that increased use of Spanish by providers would reduce barriers to enrollment. From the providers’ prospective, Buyesse et al. (2005) finds that communication is one of the major difficulties that child care providers report in providing care to Hispanic families.

Rather than issues of barriers that result in lesser secondary access to center care for Hispanic families, preferences may play an important role. Parents may feel more comfortable using centers where they can speak more extensively with the providers, or it may be that the use of the Spanish language and/or the fact that providers are Hispanic provide some signal to Hispanic parents that these providers espouse similar values and will therefore provide care that is more desirable to the family’s preferences. Or it may be that the parents specifically want Spanish spoken with their children by the provider. However, Zucker et al. (2006) finds that only 6% of Hispanic families in Los Angeles County find care whether Spanish is used with their children by a child care provider. Early and Burchinal (2001) report that use of English is an important aspect of quality in a provider, and it is possible that many Hispanic families may look at the ability of their child to be exposed to English as an important contribution of center care. So while preferences based on the comfort of the parent in dealing with a Spanish-speaking provider that may hold more similar values is a potential reason why Hispanic families would be drawn to Spanish-speaking providers, exposure to Spanish for the child is
unlikely to be a preference-related reason for not using center care among most Hispanic families.

Los Angeles County actually has a fairly large supply of Spanish-speaking providers, with more than 50 percent of all providers, and more than 70 percent of all publicly funded providers using Spanish. In addition, just as low-income families in highly Hispanic neighborhoods have greater access to all public care, they also have great access to publicly funded Spanish-speaking providers. However, the strong relationship between language and use of center care is present. This study examined whether primary access to Spanish-speaking providers mediated this relationship between language and use of center care, and found that it did not. While it appears that access to Spanish-speaking providers may have a somewhat stronger relationship with use of center care for Spanish-speaking families, the power in the analysis does not make it possible to statistically confirm this difference.

Because primary access to Spanish-speaking providers does not seem to be limited in Los Angeles County, and does not appear to mediate the effect between language and use of center care, it does not seem that an inability for parents to communicate with providers, or preference-related issues that lead Hispanic parents to prefer Spanish-speaking providers can be a primary reason for lesser use of center care among Hispanic families. It may be barriers to access earlier on in the process that are preventing Hispanic families from getting information about this relatively great availability of Spanish-speaking providers in Los Angeles County. Or it may be that language is acting as a proxy for strong preferences that these Spanish-speaking parents hold against use of center care, regardless of whether the provider speaks Spanish.
However, it is an important finding that primary access to Spanish-speaking providers cannot explain this relationship between language and use of center care.

Future Areas for Study

This study uses a relatively new method of spatial analysis to more accurately estimate primary access to child care centers, and is the first to link this spatially determined accessibility to use of center care to determine whether primary access is one of the major factors resulting in racial/ethnic differences in center care use. However, there are improvements that can be made to the analysis to more accurately estimate primary access to centers. The use of census block groups limited estimation bias relative to using census tracts, but census blocks would further reduce this bias. In addition, many families are likely to look at child care close to work in addition to providers close to the home, so looking at access within a reasonable distance from the workplace may lead to differences in estimation of primary access. Finally, while the analysis in this study used posted speed limits to determine travel time, more accurate estimates could be made using data on traffic congestion in certain areas. In addition, travel times by public transportation could also be used to estimate travel time for families without multiple vehicles. The data for the location of the workplace and more realistic travel times was available in the data used for this study and can potentially be an area of later research on this topic.

In addition to the areas where the spatial analysis could have been improved, there were a number of more general issues with the study that could be resolved with additional research. The sample was relatively small and non-representative of the
country’s population, so small relationships may not have been detected, and the results cannot be generalized to the greater U.S. population. This non-representativeness is the more serious issue, because public funding of child care is greater in California than most other states, so primary access may be a greater issue in other areas. Studies with representative samples and spatial data would be useful for this. However, this sample can be used to represent the most proactive regions in terms of child care funding, and it is evident that even when primary access to centers is greater for Hispanic families, ethnic gaps in center use remain, so we must look to barriers to access and preferences to understand these gaps. A mother’s employment also plays a major role, and the methods to examine the causal effect of employment on use of parental and center care would provide great insight into the role this source of primary access plays in child care decisions. Finally, qualitative evidence is extremely important in understanding how a family makes decisions about child care. Having qualitative data for a representative sample of Americans would be extremely useful in understanding the child care decisions.

Conclusions and Policy Recommendations

While family characteristics explain a large portion of racial/ethnic differences in the type of child care used, Hispanic families are still more likely to use parental care, and are slightly more likely to use center care (though this relationship is not significant in some models). Most of the findings in this study suggest that primary access to both relative and center care are not the primary factors generating the ethnic differences care use. Findings from a qualitative study of Los Angeles County suggest that barriers to
access, particularly information, and potentially enrollment procedures, may play a more significant role in the lesser use of center care among Hispanics (Zucker et al., 2006). Differences in preferences may also play a role. However, access to Spanish-speaking providers does have a positive effect on use of center care, particularly among Hispanics, so ensuring access to Spanish-speaking providers may diminish these barriers to access for Hispanic families and/or satisfy preferences to enroll children in center care.

These findings suggest that using public funding to build more preschools and child care centers in Hispanic neighborhoods, or to increase the publicly funded capacity of current providers is unlikely to have a substantial impact on the use of center care among Hispanic families. If encouraging greater use of ECE among low-income Hispanic families is an important aspect of future efforts to advance the education and opportunities of children in the U.S., public funding for ECE is likely to be better spent on efforts that reduce barriers to care for Hispanic families by providing more information on available resources, ensuring center care that is compatible with the often non-traditional work schedules that Hispanic have, and reducing the complexity and uncertainty of enrollment procedures. Because of the particularly low use of center care among primarily Spanish-speaking families, it may particularly important to reduce barriers for these families by making information and enrollment materials available in Spanish and English.

To the degree that ethnic differences in use of center care are due to preferences, there are also public policies that could be used to encourage greater use of ECE by low-income Hispanic families. Informational campaigns that teach Hispanic families the importance of ECE may be useful in shifting preferences toward center care. There may
always be Hispanic families that continue prefer other forms of care in spite of knowledge about the potential effects of preschool on school readiness and cognitive functioning, because of a distaste for formal settings that emphasize educational development rather than development of social and community values. For these families, public funding for ECE may be better spent ensuring that these non-center providers are given the information, resources and training to capture some of these benefits that are traditionally associated with child care provided in centers.


Brandon, P.D. (2004). The Child Care Arrangements of Preschool-Age Children in


Crosnoe, R. (2007). Early Child Care and the School Readiness of Children from


Youth 1990-2010: Changing Population Trends and Their Implications for Services. Chicago, IL: University of Chicago, Chapin Hall Center for Children.


pp. F34–F63.


Appendix B

Of the 866 respondents to the L.A.FANS survey with children between the ages of 0 and 5, 114 (13%) chose not to provide information on family income. Because the sample size was already relatively small and because family income is a key factor in determining which families qualify for public care, the decision was made to use multiple imputation to generate income values for these observations with missing data.

The first step in multiple imputation is to choose a set of regressors that are likely to be predictive of family income. It is important for these regressors to fully be relatively similar to those used in primary models in the analysis. The variables included for this imputation were race/ethnicity, the employment status of the mother, the education level of the mother, the marital status of the mother, and the where the mother was born. Using the observations with data on family income, the “uvis” command in Stata runs a regression of income on the predictor variables multiple times, creating distributions for both the regression coefficients and the residual standard errors.

Multiple imputation maintains the original variability of the missing data by creating values that are based on variables with missing data that may be leading to the causes of this missing data. It also accounts for uncertainty in the data by creating the different versions of the missing data and accounting for the variability in these data sets. Multiple imputation has been well-studied, and has been shown to perform well in a variety of situations with missing data (Graham & Hofer, 2000; Schafer & Olsen, 1998; Sinharay et al., 2001). The method provides a means for addressing missing data that is
both computational simple and allows for stronger estimates than more simplistic methods (such as using the variable mean for all missing values.)
Appendix C

Table 4.1 indicates that qualification for Head Start and CDE is based on total family income as well as family size. It was relatively easy to estimate potential demand for Head Start because census data provides exact statistics on the number of children in poverty, and the income qualification guidelines for Head Start are the exact same as those that qualify families for Federal Poverty Status. Estimation of potential demand for CDE was somewhat more difficult. On income, census data provides multiple statistics including the average family income for the census block group. However, the most useful statistics for calculating CDE qualification were the percentage of families with children falling in different income ranges. These ranges were $0 to $4,999, $5,000 to $9,999, $210,000 to $14,999, and so on for $5000 income ranges up through $60,000. Because the average family size in Los Angeles County is approximately 4, and the income qualification for publicly subsidized care for a family of 4 is $39,000, the most basic estimate of the percentage of children qualifying for CDE was the percentage of families with children in each census block that had incomes of $39,999 or less. This estimate does not take into account the fact that children can still attend CDE centers without qualifying for subsidies, and that not all families that qualify for subsidies receive free care. The income ranges are also for all families with children, not families with children between the ages of 0 to 5. So there is likely to be some error involved with the use of these statistics as an estimate of qualification of publicly funded CDE.

A major factor that is not taken into account in these basic CDE qualification estimates is the role of family size in determining income qualification. This can bias the estimates of the number of qualifying children upward for census block groups where the
average family size is less than 4, and can bias the estimates of qualifying children downward for census block groups where the average family size is more than 4. This may be a particular issue when looking at qualification rates by the concentration of Hispanics in each neighborhood, because Hispanic families tend to be larger, so qualification rates will be particularly biased downward for heavily Hispanic neighborhoods. To account for variation in family size across census block groups, an alternate estimate of children qualifying for CDE was created according to the following formulas:

<table>
<thead>
<tr>
<th>Average Family Size of Census Block Group</th>
<th>Percent of Families Qualifying for CDE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 to 2.3</td>
<td>% with incomes &lt;$30,000 + 0.1 * %</td>
</tr>
<tr>
<td></td>
<td>with incomes $30,000-$34,999</td>
</tr>
<tr>
<td>2.3 to 2.8</td>
<td>% with incomes &lt;$30,000 + 0.6 * %</td>
</tr>
<tr>
<td></td>
<td>with incomes $30,000-$34,999</td>
</tr>
<tr>
<td>2.8 to 3.3</td>
<td>% with incomes &lt;$35,000</td>
</tr>
<tr>
<td>3.3 to 3.8</td>
<td>% with incomes &lt;$35,000 + 0.5 * %</td>
</tr>
<tr>
<td></td>
<td>with incomes $35,000-$39,999</td>
</tr>
<tr>
<td>3.8 to 4.3</td>
<td>% with incomes &lt;$40,000</td>
</tr>
<tr>
<td>4.3 to 4.8</td>
<td>% with incomes &lt;$40,000 + 0.25 * %</td>
</tr>
<tr>
<td></td>
<td>with incomes $40,000-$44,999</td>
</tr>
<tr>
<td>4.8 to 5.3</td>
<td>% with incomes &lt;$40,000 + 0.5 * %</td>
</tr>
<tr>
<td></td>
<td>with incomes $40,000-$44,999</td>
</tr>
<tr>
<td>5.3 to 5.8</td>
<td>% with incomes &lt;$40,000 + 0.75 * %</td>
</tr>
<tr>
<td></td>
<td>with incomes $40,000-$44,999</td>
</tr>
<tr>
<td>5.8 to 6.3</td>
<td>% with incomes &lt;$40,000 + % with</td>
</tr>
<tr>
<td></td>
<td>incomes $40,000-$44,999</td>
</tr>
<tr>
<td>6.3 to 6.8</td>
<td>% with incomes &lt;$45,000 + 0.25 * %</td>
</tr>
<tr>
<td></td>
<td>with incomes $45,000-$49,999</td>
</tr>
<tr>
<td>More than 6.8</td>
<td>% with incomes &lt;$45,000 + 0.5 * %</td>
</tr>
<tr>
<td></td>
<td>with incomes $45,000-$49,999</td>
</tr>
</tbody>
</table>
Appendix D

The table below shows the relationship between tract-level access statistics, where census tract population-weighted mean centers are used to approximate the locations for demand, to block group-level access statistics, where census block group population-weighted mean centers are used to approximate the locations for demand. Using census block groups rather than tracts is a superior method of approximating demand for child care because it minimizes the error involved in the assumption that all households within the area are located at the population-weighted mean center (because census block groups are subsets of census tracts). This is why access statistics for Chapter VII are presented for census block groups.

However, because the L.A.FANS data for use of center care was collected in 2000 (simultaneous to 2000 census data collection), the primary census location data included in the data set was for 1990. Census tracts for 2000 were also included in the data, but unfortunately census blocks and census block groups for 2000 were not. So the analyses that relate access and use of center care have to use tract-level access statistics. According to traditional use of floating catchment techniques, it is not correct to use averages of census block group statistics to estimate access for census tracts. So instead access had to be recalculated at the tract level. Because different chapters in this study use different levels of analysis for demand, it was important to show that tract averages of census block group access statistics are similar to tract access statistics.
The correlation coefficients indicate a high degree of similarity between tract-level access and population-weighted tract averages of block group-level access, with the agreement between statistics higher than 0.90 for all statistics. The agreement between statistics increases as the level of the buffer zone increases. The agreement between statistics is the lowest for access to Spanish-speaking providers among children ages 2 to 5, but the absolute level of the correlation statistic is still relatively high. This indicates that while it may be technically improper to use tract-level averages of block group-level statistics, the results for this analysis would not have been dramatically different.
Appendix E

The table below presents access statistics to Spanish-Speaking providers for children ages 0 to 5. When compared to access for children ages 2 to 5, the access statistics for these children are approximately two-thirds of the values (across publicly funded and all providers, Spanish-speaking only and all language providers). Just as with children ages 2 to 5, when looking at the access of all children to all providers, the relationship between Hispanic concentration of children within a neighborhood and access is reversed when supply is limited to all Spanish-speaking providers. In the analysis of access of children in poverty to publicly funded slots, limiting supply to all Spanish-speaking providers slightly increases the access premium for heavily Hispanic neighborhoods (relative to neighborhoods with low concentrations of Hispanics) from 2.32 to 2.94.

<table>
<thead>
<tr>
<th>Hispanic Concentration</th>
<th>Children in Poverty to Spanish Provider Public Slots</th>
<th>Children in Poverty to All Public Slots</th>
<th>All Children to All Spanish Provider Slots</th>
<th>All Children to All Slots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>8.52</td>
<td>13.14</td>
<td>6.64</td>
<td>15.59</td>
</tr>
<tr>
<td>Medium</td>
<td>10.00</td>
<td>14.28</td>
<td>7.35</td>
<td>14.05</td>
</tr>
<tr>
<td>High</td>
<td>11.46</td>
<td>15.46</td>
<td>7.46</td>
<td>12.48</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10.39</strong></td>
<td><strong>14.61</strong></td>
<td><strong>7.24</strong></td>
<td><strong>13.62</strong></td>
</tr>
</tbody>
</table>
Appendix F

The table below presents the results for language and access to Spanish-speaking providers for the full sample of children ages 0 to 5. The relationship between access to Spanish-speaking providers and use of center care was not significant in the table that did not include language (in Chapter XIII), and is not significant in these models either, even when the access is interacted with language.

Access to Spanish-Speaking Centers and the Relationship between Language and Center Care Use

<table>
<thead>
<tr>
<th></th>
<th>Children in Poverty</th>
<th>All Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spanish Language Interview</td>
<td>0.14***</td>
<td>0.11**</td>
</tr>
<tr>
<td>Access to SSPs</td>
<td>0.017 (0.21)</td>
<td>- (0.31)</td>
</tr>
<tr>
<td>Access to SSPs for Spanish-Speakers</td>
<td>- (0.20)</td>
<td>- (1.03)</td>
</tr>
<tr>
<td>Access to SSPs for English-Speakers</td>
<td>- (0.27)</td>
<td>- (0.32)</td>
</tr>
</tbody>
</table>

* Represents significance at the 10% level ** Represents significance at the 5% level *** Represents significance at the 1% level.

Models control for all child and fam