



Pre-kindergarten child care and behavioral outcomes among children of immigrants[☆]

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ABSTRACT

The school transition model suggests that children's transitions into formal schooling can have lasting and profound implications for their educational careers, though this model is rarely used to understand the outcomes of children of immigrants. Using data from the Early Childhood Longitudinal Study-Kindergarten Cohort (ECLS-K), a nationally representative sample of kindergarteners in 1998–1999, we examine the pre-kindergarten child care arrangements of children of immigrants and how these care arrangements are associated with children's behavior. We find that minority and immigrant children are less likely than their native-born white counterparts to be enrolled in center-based care and other care, compared to parental care, prior to kindergarten. We also find that ethnic origin is an important predictor of child care usage. Finally, though center-based care, on average, is not independently associated with children's behavior in kindergarten, the association between center-based care and behaviors varies by race and immigrant status. Broadly, these findings underscore the importance of understanding how native- and foreign-born children experience the transition to schooling, a critical period in the life course.

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Recent demographic changes in the United States – including an increase in female-headed households and an increase in maternal employment while children are still young – have made child care an important concern for working parents (Burchinal, 1999; Spain & Bianchi, 1996). Indeed, in the United States, more children than ever before receive some form of care outside the home. At least 1.8 million children received nonparental care in 2005, with more than half of them being under the age of five (Administration for Children and Families, 2006). The majority (nearly 60%) of these children received some form of center-based care, which can include private child care centers or Head Start programs. Other children received care outside of a formal center, which is often provided by relatives in their own homes or in the children's homes (Administration for Children and Families, 2006).

In addition to the demographic changes that have made nonparental care a necessity for many parents, the population of children has become increasingly diverse with respect to race and nativity (Hernandez, 1997). Children of immigrants, for example, are one of the most rapidly growing segments of the United States' population, with one in four children being an immigrant or having at least one immigrant parent (O'Hare, 2004). Studying children of immigrants is especially important among Hispanic and Asian populations, as nearly 60% of Hispanic youth and 90% of Asian youth are immigrants or children

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of immigrants (Zhou, 1997). Social scientists have begun to examine the educational outcomes of this fast-growing segment of the school-aged population (e.g., Kao & Tienda, 1995; Portes & Rumbaut, 2001; Rumbaut & Portes, 2001; Zhou, 1997). We know much more about adolescent children from immigrant families than young children from these families, despite the fact that ethnic differences in educational outcomes emerge well before high school. Examining the outcomes of young children is particularly important, of which child care is a crucial part, as educational experiences early in the life course put children on educational trajectories that are difficult to change (Entwisle & Alexander, 1993). Behavior in early childhood also has substantial implications for school readiness, cognitive outcomes, and life course trajectories (Entwisle & Alexander, 1993; Knoester, 2003; McLeod & Kaiser, 2004; Shanahan, 2000).

In this paper, we examine the pre-kindergarten child care arrangements of children of immigrants and how these care arrangements are associated with children's behavior. We use data from the Early Childhood Longitudinal Study-Kindergarten Cohort (ECLS-K), a study conducted by the National Center for Education Statistics (NCES) of a nationally representative cohort of approximately 22,000 kindergartners in 1998–1999. These data were collected in a multistage sampling frame in which students were nested within about 1000 schools in 100 counties.

1. School readiness and the beginning school transition

The school transition model (Alexander & Entwisle, 1988) suggests that children's transitions into formal schooling can have lasting and profound implications for their educational careers. Because children beginning kindergarten are at a critical period in their cognitive and social development, what happens to them at this age can have a more powerful influence than their experiences in later developmental stages (Alexander & Entwisle, 1988; Entwisle & Alexander, 1993). For example, those students who enter kindergarten classrooms with more favorable internalizing and externalizing behaviors are more likely to experience high levels of educational achievement and attainment throughout the life course (McLeod & Kaiser, 2004). Those who enter formal schooling unprepared, however, are likely to fall behind as they progress through the educational system (Alexander & Entwisle, 1988). The school transition model also suggests that contextual factors may predict how students experience the transition to schooling. Children from minority and socioeconomically disadvantaged families, for example, have disadvantaged academic and behavioral outcomes before they enter kindergarten (Lee & Burkam, 2002).

Thus, the school transition model is a useful theoretical framework for understanding disparities in behavioral outcomes at the beginning of kindergarten. Children of immigrants are rarely included in this framework, though this model may be particularly relevant to this group of children who face particular challenges before and during the transition to kindergarten. Children raised by immigrant parents, for example, may face barriers in interacting with their classmates and teachers. Some cultural practices for showing respect, such as not looking someone directly in the eyes, may be interpreted as disobedience by American teachers, the majority of whom stress the social aspects of school readiness (Lin, Lawrence, & Gorrell, 2003; Wesley & Buysse, 2003). Thus, in this paper, we extend the school transition model to include children of immigrants, by examining how pre-kindergarten child care arrangements are associated with behavioral outcomes at the beginning of kindergarten.

1.1. Predictors of pre-kindergarten child care arrangements

Race and immigrant status are important predictors of child care arrangements. Black children are more likely than their white counterparts to receive formal care, and some research suggests Black parents may have better access to Head Start and state preschools (Fuller, Holloway, Rumbaugh, & Eggers-Pierola, 1996; Liang, Fuller, & Singer, 2000; Radey & Brewster, 2007). Hispanic children, on the other hand, are less likely than whites to receive formal care (Buysse, Castro, West, & Skinner, 2005). Minority children are also more likely to receive care from kin members (Early & Burchinal, 2001; NICHD Early Child Care Research Network, 2004; Radey & Brewster, 2007). Additionally, children of immigrants and non-English speaking children are enrolled in center-based child care significantly less often than their native-born or English-speaking peers, and are more likely to receive informal care (Brandon, 2004; Crosnoe, 2007; Magnuson, Lahaie, & Waldfogel, 2006). This is particularly true among low-income immigrant families (Brandon, 2004; Nord & Griffin, 1999). Of course, other individual-level characteristics predict child care decisions. Research from the National Institute of Child Health and Human Development Early Child Care Research Network (hereafter NICHD ECCRN), for example, suggests that socioeconomic characteristics most strongly and consistently affect parents' decisions about children's receipt of nonmaternal care (NICHD ECCRN, 1997; also see Early & Burchinal, 2001).

1.2. Child care arrangements and behavioral outcomes

The stratification of child care usage along demographic and socioeconomic lines is important because center-based care is generally associated with better cognitive outcomes (Burchinal, 1999; Loeb, Fuller, Kagan, & Carrol, 2004; Magnuson, Meyers, Ruhm, & Waldfogel, 2004; NICHD ECCRN, 2000). Minority children may experience greater cognitive benefits from center-based care than white children, though this type of care is equally beneficial for native- and foreign-born children (Gormley & Phillips, 2005; Magnuson et al., 2006). On the other hand, center-based care may lead to more behavioral problems in children (Belsky et al., 2007; Gormley & Gayer, 2005; Loeb, Bridges, Bassok, Fuller, & Rumberger, 2007), and these effects are modest but long lasting (Burchinal, 1999). For example, early childhood experiences in center-based care

is associated with less self-control and more externalizing behavior problems through first grade (Magnuson, Ruhm, & Waldfogel, 2007) and more behavior problems in sixth grade (Belsky et al., 2007).

Though center-based child care is generally associated with less favorable behavioral outcomes, this negative association may not persist across all groups of children (Loeb et al., 2007). Among children of immigrants, for example, exposure to a child care setting may lead to more favorable behavioral outcomes. Children of immigrants often have socioeconomic, linguistic, or cultural barriers that may lead to less favorable behavioral outcomes at the beginning of the life course. Pre-kindergarten child care may facilitate the beginning school transition by introducing these children to American cultural norms and customs, as well as by aiding in their English language development (Brandon, 2004; Fuller, 2007; Magnuson et al., 2006). However, we know little about how child care arrangements are associated with behavioral outcomes among children of immigrants, and if child care differentially influences children of native-born and foreign-born parents.

1.3. Research questions

This paper addresses three research questions. First, do minority immigrant groups report different primary pre-kindergarten child care arrangements than their native-born white counterparts? Consistent with prior research, we expect that children of minority immigrant parents will be less represented in center-based care and more represented in parental care. Second, to what extent does pre-kindergarten child care usage predict parent reports of children's behavioral development at the beginning of kindergarten? We expect that center-based pre-kindergarten programs, compared to parental care, will be associated with less favorable behavior among children. Finally, does the association between child care arrangements and behavioral outcomes vary by race and immigrant status? We anticipate that center-based child care will be associated with more favorable outcomes among children of immigrants compared with children of native-born parents.

2. Method

2.1. Participants

These analyses use data from the ECLS-K, one of a few nationally representative data sources that offer information on both pre-kindergarten child care arrangements and outcomes in elementary school. Other relevant data sources include the NICHD Study of Early Child Care, the Early Childhood Longitudinal Study-Birth Cohort (ECLS-B), and the Fragile Families and Child Wellbeing Study. The NICHD study, however, excluded mothers from the sample if they did not speak English. The ECLS-B and Fragile Families data included children of immigrants, but there are fewer minority immigrant children in these samples than in the ECLS-K. Importantly, the ECLS-K oversampled for Hispanic children, Asian children, and children of immigrants, three populations generally neglected in research on child care selection and childhood outcomes. One important limitation to the ECLS-K, however, is that it does not include a measure of child care quality, which is positively, moderately correlated with behavioral outcomes (Burchinal, 1999; NICHD ECCRN, 1998, 2004). Despite this important limitation, due to the nature of our research questions, the limitations of the ECLS-K are outweighed by its benefits.

The analytic sample for this paper consisted of 10,410 children. Because we focused on the association between pre-kindergarten child care and developmental outcomes at the beginning of kindergarten, we primarily used data from the first (when children were beginning kindergarten) and fourth (when children were at the end of first grade) survey waves. Thus, we deleted the 7960 observations that did not participate in both waves. We deleted 280 observations missing data on mother's race, as well as 460 observations of minority groups not of substantive interest to our analyses (including 160 Native Hawaiians or other Pacific Islanders, 210 American Indians or Alaska Natives, and 90 multiracials). We also deleted observations missing mother's immigrant status, pre-kindergarten child care arrangements, or children's behavior. In adherence to NCES regulations for using restricted-use data, we rounded all sample sizes to the nearest 10.

Thus, our analytic sample must be kept in mind when interpreting our results. Reports of children's behavior were similar across the full sample and analytic sample, but two important differences emerged. First, children in our analytic sample were more likely than children in the full sample to be enrolled in center-based care ($p < 0.001$) and more likely to receive only parental care ($p < 0.001$). Second, our sample was more advantaged than the original sample; families had higher levels of SES ($p < 0.001$) and children were more likely to have married parents ($p < 0.001$). Very few observations were missing control variables, and we imputed these missing values using a regression-based approach in Stata. In results not presented, we used listwise deletion, which did not substantively change our results. Because of nonrandom attrition over time, and the complex stratified random sampling design, our multivariate analyses used weights constructed by NCES (c1_4pw0). All analyses also used the accompanying strata (c1_4pstr) and primary sampling unit variables (c1_4ppsu).

Table 1 presents means and standard deviations for all variables used in the analyses. About 66% of the sample had white native-born mothers. Nearly half (48%) of children were enrolled in center-based child care (including day care, nursery school, preschool, and pre-kindergarten), and about 8% of children were enrolled in a Head Start program. About one-quarter (25%) received another type of care. Among children who received other care, about half primarily received care from a relative and half received care from a nonrelative (descriptives not shown). Nearly one-fifth (18%) of children received only parental care.

Table 1
Means and standard deviations of variables used in analyses.

Variable	Mean	S.D.	Min	Max
Behavioral outcomes				
Approaches to learning	3.14	0.47	1.33	4.00
Self-control	2.85	0.50	1.00	4.00
Social interaction	3.35	0.55	1.33	4.00
Sad/lonely	1.54	0.39	1.00	4.00
Impulsive/overactive	1.93	0.66	1.00	4.00
Primary type of pre-kindergarten child care				
Parental care (<i>n</i> = 1880) ^a	0.18	n/a	0.00	1.00
Center-based care (<i>n</i> = 5040)	0.48	n/a	0.00	1.00
Head Start (<i>n</i> = 840)	0.08	n/a	0.00	1.00
Other care (<i>n</i> = 2650)	0.25	n/a	0.00	1.00
Race and immigrant status				
White native-born (<i>n</i> = 6880)	0.66	n/a	0.00	1.00
White foreign-born (<i>n</i> = 280)	0.03	n/a	0.00	1.00
Black native-born (<i>n</i> = 1160)	0.11	n/a	0.00	1.00
Black foreign-born (<i>n</i> = 90)	0.01	n/a	0.00	1.00
Hispanic native-born (<i>n</i> = 620)	0.06	n/a	0.00	1.00
Hispanic foreign-born (<i>n</i> = 850)	0.08	n/a	0.00	1.00
Asian native-born (<i>n</i> = 80)	0.01	n/a	0.00	1.00
Asian foreign-born (<i>n</i> = 450)	0.04	n/a	0.00	1.00
Demographic characteristics				
Family income (log)	10.59	1.16	0.00	13.82
Father's education	4.63	2.01	1.00	9.00
Mother's education	4.47	1.78	1.00	9.00
Father's occupational prestige	34.62	20.54	0.00	77.50
Mother's occupational prestige	30.20	22.70	0.00	77.50
Father not working	0.04	n/a	0.00	1.00
Mother not working	0.32	n/a	0.00	1.00
Marital status of biological parents				
Married (<i>n</i> = 7945)	0.78	n/a	0.00	1.00
Separated (<i>n</i> = 377)	0.04	n/a	0.00	1.00
Divorced (<i>n</i> = 773)	0.08	n/a	0.00	1.00
Widowed (<i>n</i> = 68)	0.01	n/a	0.00	1.00
Never married (<i>n</i> = 1241)	0.13	n/a	0.00	1.00
Number of children in household				
Child is female	0.50	n/a	0.00	1.00
Age of child (in months)	68.57	4.26	54.00	79.00
Child speaks only English at home	0.89	n/a	0.00	1.00
Region				
Northeast (<i>n</i> = 2040)	0.20	n/a	0.00	1.00
Midwest (<i>n</i> = 2780)	0.27	n/a	0.00	1.00
West (<i>n</i> = 2150)	0.21	n/a	0.00	1.00
South (<i>n</i> = 3440)	0.33	n/a	0.00	1.00
Parent respondent is not mother	0.05	n/a	0.00	1.00
<i>N</i>	10,410			

^a In adherence to NCES regulations for using restricted-use data, we have rounded all sample sizes to the nearest 10.

2.2. Measures

2.2.1. Child care usage

We used parental reports of the *primary type of child care* their child received during the year before kindergarten. If the child received more than one type of care, primary type of child care was determined by the child care arrangement where the child spent the most hours per week. Parental reports of pre-kindergarten child care included the following dummy variables: parental care (reference category in our multivariate analyses), center-based care, Head Start, and other care. Children receiving other care were cared for by relatives or nonrelatives in their own home or someone else's home.

Parents who reported their child primarily attended center-based care were asked to distinguish between the following types of center-based child care: day care center, nursery school, preschool, or pre-kindergarten program. Because using these more fine-grained distinctions did not yield substantively different results, we used the broad measure of center-based care. On the other hand, though a form of center-based care, we did not include Head Start in this measure because there is

substantial likelihood of nonrandom selection into the program (Currie & Thomas, 1995). Nearly all children enrolled in Head Start come from families below the poverty line and enter with below-average skills (Department of Health and Human Services, 2003). Additionally, it is likely that some parents incorrectly reported the child's primary child care arrangements before kindergarten. However, because only a small amount of time elapsed between the year before kindergarten and the parent interview, we expected these inaccuracies to be minor. Additionally, we had no reason to believe that there were systematic differences between parents, most notably by race and immigrant status, who accurately reported their information and those who did not.

2.2.2. Behavioral outcomes

We examined children's scores on the Social Rating Scale (SRS), a series of questions administered to parents when children were beginning kindergarten. Parents were asked how often children exhibited particular skills and behaviors: (1) never; (2) occasionally or sometimes; (3) regularly but not all of the time; and (4) most of the time. Thus, values for each outcome variable ranged from 1 to 4. Respondents were also given the opportunity to report that they had no opportunity to observe the behavior in question, and these observations were coded as missing and thus excluded from our analyses. These analyses complement the work of Magnuson et al. (2006), who looked at the association between pre-kindergarten child care arrangements and academic readiness. Some language minority children were excluded from the academic readiness assessments at the beginning of kindergarten, but all parents were asked to report on the children's behavior, regardless of children's language abilities.

The SRS administered to parents included the following five scales: approaches to learning, self-control, social interaction, impulsive/overactive, and sad/lonely. The *approaches to learning* scale included six items that rate how often children show eagerness to learn, interest in a variety of things, creativity, persistence, concentration, and responsibility ($\alpha = 0.68$). The *self-control* scale included five items that indicate how well children can control their behavior ($\alpha = 0.74$). The *social interaction* scale included three items that measure children's interactions with peers and adults ($\alpha = 0.70$). Finally, the *impulsive/overactive* scale measured children's impulsivity and activity level ($\alpha = 0.46$), and the *sad/lonely* scale included four items about children's acceptance by others, sadness, loneliness, and self-esteem ($\alpha = 0.60$). Though the reliability of these last two scales is relatively low, we include these as outcomes because they are conceptually distinct from the other three indicators of child development. Additionally, these last two scales were coded in an opposite direction as the first three; higher values indicated *more* behavioral problems (Rock & Pollack, 2002).

2.2.3. Race and immigrant status

Race and immigrant status were represented by a series of dummy variables: white native-born (reference category), white foreign-born, Black native-born, Black foreign-born, Hispanic native-born, Hispanic foreign-born, Asian native-born, and Asian foreign-born. As children in this study were quite young, and because mothers usually serve as the primary decision-makers in early childhood, we used both the race and immigrant status of the mother instead of the child. Thus, in our sample, immigrant children comprised one of two groups: first-generation children born outside of the United States who migrated to the United States with their parents before they enrolled in kindergarten, and second-generation children born in the United States to foreign-born parents. Also, because this is a very young sample of children, there is no meaningful distinction between children born in the United States versus those who are foreign-born because none of the children have attended school outside of the United States. Hence, immigrant children always refers to children of immigrants, the vast majority of whom were born in the United States, which is consistent with the work of others using these data (Crosnoe, 2005, 2006, 2007; Magnuson et al., 2006).

These race and immigrant groups mask panethnic differences that were likely associated with both children's child care arrangements and behavioral outcomes. Among Hispanic foreign-born children, for example, parents' country of origin or migration history may have varied. In supplemental analyses, we took two steps to address this. First, we looked at how ethnicity predicts child care arrangements. Second, we included controls for parents' English language ability and time spent in the United States.

2.2.4. Additional covariates

Our multivariate analyses controlled for a host of individual-level characteristics that may be associated with child care arrangements or behavioral outcomes. To begin with, we included several controls for *socioeconomic status*, including household income, education, and occupational prestige. We used a logged measure of household income from the past year, which included salaries, other earnings, interest, and retirement. Mother's and father's education were represented by two continuous variables that ranged from 1 (eighth grade or below) to 9 (doctorate or professional degree). Additionally, mother's and father's occupational prestige were two continuous variables that ranged from 29.0 to 77.5. Mothers and fathers who were not working were coded as having an occupational prestige score of 0; to account for this in our analyses, we included dummy variables indicating if the mother and/or father was not working (1 = not working, 0 = employed part- or full-time).

Additionally, we controlled for two measures of family environment. *Family structure* was represented by a series of dummy variables: parents married (reference category), separated, divorced, widowed, and never married. *Number of children in household* was a continuous variable that ranged from 1 to 11. Region of the country was represented by a series of dummy variables: South (reference category), Northeast, Midwest, and West. We also controlled for several child character-

istics. *Child gender* was represented by a dummy variable (1 = female, 0 = male), and *child age* was a continuous variable that ranged from 54 to 79 months. We included a dummy variable that represented the *child's language* (1 = speaks only English at home, 0 = speaks another language at home). Finally, we included a dummy variable indicating if the *respondent is not the child's mother*. In a majority of cases (95%), mothers completed the survey.

3. Results

3.1. Race and immigrant status as a predictor of pre-kindergarten child care usage

Table 2 showed differences in type of pre-kindergarten child care arrangement by race and immigrant status. We used chi-square tests to determine the statistical significance of race and immigrant differences in child care usage, with native-born whites as the comparison group. This table shows that minority immigrant children were generally underrepresented in center-based care. About 53% of native-born white children were enrolled in center-based care the year prior to kindergarten, but substantially fewer Hispanic and Asian children received center-based care. Only 38% of native-born Hispanics and 29% of foreign-born Hispanics received center-based care. Though the enrollment of native-born Asians resembles that of native-born whites (53%), only 45% of foreign-born Asians were enrolled in center-based care.

Consistent with expectations, minority and immigrant children were more likely than native-born white children to be enrolled in Head Start. About one-quarter of native-born Blacks and 13% of foreign-born Blacks experienced this arrangement prior to kindergarten, compared with only 4% of native-born whites. Hispanic and Asian immigrants (14% and 10%, respectively) were also more likely than native-born whites to be enrolled in Head Start. On the other hand, minority and immigrant children were generally more likely than native-born white children to receive only parental care.

In Table 3, we present multinomial logistic regression models that predicted children's primary type of pre-kindergarten child care. We compared receipt of each of the three types of nonparental care (center-based care, Head Start, and other care) to parental care. The first set of models examined the bivariate association between race and immigrant status and child care arrangements, and the second set of models included a host of individual-level characteristics.

Once demographic and socioeconomic characteristics were taken into account in the second model predicting center-based care compared to parental care, native-born Hispanic children attended center-based care prior to kindergarten at similar rates as their native-born white counterparts. The inclusion of these characteristics, however, did not attenuate the underrepresentation of foreign-born Hispanics and foreign-born Asians in center-based care. Additionally, native-born Blacks were more likely than native-born whites to receive this type of care. In Table 3, we presented these models with native-born whites as the reference group. However, we ran each model eight times, with each race and immigrant status dummy variable serving as the reference group once. When native-born Blacks were the reference group, we found that they were statistically more likely than all other groups of children to be in center-based care compared to parental care. When foreign-born Hispanics or foreign-born Asians were the reference group, only native-born whites and native-born blacks were more likely to receive center-based care.

Table 3 showed little variation in Head Start attendance by race and immigrant status. There were two noteworthy exceptions. First, native-born Blacks were more than four times as likely to be enrolled in Head Start, compared with parental care, than native-born whites. Foreign-born Hispanics were less likely to be enrolled in Head Start. Rotating the reference group showed that native-born Blacks were statistically significantly more likely than all other groups of children to be enrolled in Head Start compared to parental care. Additionally, foreign-born Hispanics were significantly less likely than native-born Hispanics to be enrolled in Head Start. Asian native-borns were more likely than Hispanic

Table 2
Race/immigrant differences in behavioral outcomes and pre-kindergarten child care.

Variable	White NB	White FB	Black NB	Black FB	Hispanic NB	Hispanic FB	Asian NB	Asian FB
Primary type of pre-kindergarten child care								
Parental care	0.16	0.19	0.13**	0.22	0.22***	0.36***	0.21	0.21**
Center-based care	0.53	0.60*	0.40***	0.45	0.38***	0.29***	0.53	0.45**
Head Start	0.04	0.04	0.25***	0.13***	0.11***	0.14***	0.03	0.10***
Other care	0.27	0.17***	0.23**	0.20	0.29	0.21**	0.24	0.24
Behavioral outcomes								
Approaches to learning	3.18	3.11*	3.09***	3.02***	3.10***	2.96***	3.08*	3.04***
Self-control	2.85	2.91*	2.84	2.88	2.86	2.81*	2.92	2.93***
Social interaction	3.41	3.27***	3.35***	3.27**	3.35**	3.04***	3.28*	3.13***
Sad/lonely	1.53	1.53	1.57**	1.49	1.52	1.50*	1.57	1.64***
Impulsive/overactive	1.89	1.84	2.18***	1.92	1.90	1.96**	1.80	1.90
N	6,680	280	1,160	90	620	850	80	450

Note: Symbols compare race/immigrant groups to native-born whites. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 3
Multinomial logistic regression predicting primary type of pre-kindergarten child care.

Variable	Center-based vs. parental care		Head Start vs. parental care		Other care vs. parental care	
	Model 1 e β (SE β)	Model 2 e β (SE β)	Model 1 e β (SE β)	Model 2 e β (SE β)	Model 1 e β (SE β)	Model 2 e β (SE β)
Race/immigrant status						
White native-born (reference)	–	–	–	–	–	–
White foreign-born	0.96 (0.16)	0.92 (0.18)	0.83 (0.33)	0.85 (0.34)	0.53** (0.20)	0.62* (0.22)
Black native-born	0.96 (0.10)	1.46** (0.12)	7.13*** (0.12)	4.16*** (0.14)	1.07 (0.11)	1.16 (0.13)
Black foreign-born	0.61 (0.27)	0.64 (0.30)	2.09* (0.37)	1.52 (0.38)	0.54 (0.32)	0.45* (0.34)
Hispanic native-born	0.52*** (0.11)	0.80 (0.13)	1.88*** (0.16)	1.30 (0.18)	0.78* (0.12)	0.94 (0.14)
Hispanic foreign-born	0.25*** (0.09)	0.69* (0.15)	1.36* (0.13)	0.57* (0.23)	0.35*** (0.10)	0.68* (0.17)
Asian native-born	0.77 (0.29)	0.64 (0.31)	0.43 (0.75)	0.52 (0.76)	0.67 (0.34)	0.62 (0.36)
Asian foreign-born	0.63*** (0.13)	0.64** (0.16)	1.71** (0.19)	1.22 (0.25)	0.67** (0.15)	0.67* (0.19)
Individual-level characteristics						
Family income (log)		1.30*** (0.03)		0.93* (0.03)		1.13*** (0.04)
Father's education		1.11*** (0.02)		0.82*** (0.04)		0.99*** (0.02)
Mother's education		1.25*** (0.02)		0.94 (0.04)		1.18*** (0.03)
Father's occupational prestige		1.00 (0.01)		1.00 (0.01)		1.00 (0.01)
Mother's occupational prestige		1.02*** (0.00)		0.99 (0.01)		1.02*** (0.00)
Father not working		0.69* (0.19)		0.93 (0.23)		0.67 (0.20)
Mother not working		0.92 (0.18)		0.46** (0.30)		0.30*** (0.20)
Marital status of biological parents						
Married (reference)		–		–		–
Separated		1.26 (0.19)		1.31 (0.23)		2.14*** (0.19)
Divorced		2.59*** (0.17)		3.21*** (0.21)		3.24*** (0.18)
Widowed		1.05 (0.37)		2.18 (0.42)		1.92 (0.36)
Never married		1.36* (0.13)		1.55** (0.16)		2.12*** (0.14)
Number of children in household						
Number of children in household		0.74*** (0.03)		1.00 (0.03)		0.81*** (0.00)
Child is female		1.14* (0.06)		1.33** (0.09)		1.18* (0.07)
Age of child (in months)		1.00 (0.01)		0.99 (0.01)		0.98* (0.01)
Child speaks only English at home		0.97 (0.14)		0.54** (0.20)		0.74 (0.16)
Constant	1.20***	–2.70***	–1.29***	2.48**	0.51***	–0.39**
N	10,410	10,410	10,410	10,410	10,410	10,410
Pseudo R ²	0.03	0.14	0.03	0.14	0.03	0.14

Note: Analyses weighted to account for sampling design. Robust standard errors in parentheses. Model 2 also includes dummy variables for region of country. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

foreign-borns to attend Head Start, and Hispanic foreign-borns were less likely to receive Head Start care than Asian foreign-borns.

Finally, all groups of immigrant children were less likely than native-born whites to receive other care compared to parental care. Immigrant children were between 1.5 times less likely (Hispanic foreign-born) and 2.2 times less likely (Black foreign-born) to receive other care compared to native-born whites.

Table 4

Multinomial logistic regression predicting association between ethnicity and primary type of pre-kindergarten child care.

Variable	Other care vs. parental care		Center-based vs. parental care		Head Start vs. parental care	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	e β (SE β)	e β (SE β)	e β (SE β)	e β (SE β)	e β (SE β)	e β (SE β)
Race/immigrant status						
White (reference)	–	–	–	–	–	–
Black	0.97 (0.10)	1.40** (0.11)	6.53*** (0.11)	4.03*** (0.14)	1.08 (0.10)	1.12 (0.13)
Mexican	0.39*** (0.10)	0.95 (0.12)	1.82*** (0.14)	1.25 (0.18)	0.72** (0.11)	1.23 (0.13)
Puerto Rican	0.67 (0.24)	0.93 (0.26)	2.05* (0.32)	1.55 (0.33)	1.07 (0.25)	1.04 (0.27)
Cuban	2.70* (0.45)	1.90 (0.49)	0.76 (1.09)	0.59 (1.10)	1.12 (0.56)	0.98 (0.61)
Other Hispanic	0.75 (0.16)	1.03 (0.18)	2.54*** (0.22)	1.73* (0.24)	0.90 (0.18)	0.91 (0.20)
Asian Indian	1.18 (0.30)	0.58 (0.33)	0.49 (0.76)	0.68 (0.78)	0.94 (0.37)	0.69 (0.41)
Chinese	3.99*** (0.36)	3.42** (0.38)	1.94 (0.61)	2.37 (0.62)	2.57* (0.40)	2.51* (0.43)
Filipino	0.66 (0.23)	0.38*** (0.25)	0.46 (0.54)	0.53 (0.55)	1.57* (0.23)	0.83 (0.25)
Japanese	2.01 (0.37)	1.14 (0.39)	–	–	1.09 (0.45)	0.73 (0.47)
Korean	1.94 (0.40)	1.23 (0.42)	1.03 (0.80)	1.48 (0.80)	1.63 (0.45)	1.18 (0.48)
Vietnamese	0.84 (0.41)	0.75 (0.44)	1.34 (0.67)	1.37 (0.68)	1.38 (0.44)	1.02 (0.47)
Hmong	0.12** (0.79)	0.52 (0.82)	14.51*** (0.41)	11.02*** (0.46)	0.54 (0.61)	0.69 (0.65)
Other Asian	0.72 (0.29)	0.66 (0.32)	1.37 (0.45)	1.29 (0.46)	0.68 (0.35)	0.57 (0.38)
Mother immigrant	0.57*** (0.09)	0.80* (0.11)	0.71** (0.13)	0.56** (0.18)	0.49*** (0.10)	0.65** (0.13)
Constant	1.19***	–2.94***	–1.28***	2.13*	0.50***	–0.49**
N	10,410	10,410	10,410	10,410	10,410	10,410
Pseudo R ²	0.04	0.14	0.04	0.14	0.04	0.14

Note: Analyses weighted to account for sampling design. Robust standard errors in parentheses. Model 2 includes all covariates from Table 3. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The prior analyses found that race and immigrant status was an important predictor of pre-kindergarten child care arrangements but did not control for the length of time the child's mother lived in the United States or her English fluency, two factors that may influence child care decisions made by immigrant parents. In supplemental analyses, we restricted the sample to immigrant parents and included these two additional variables. Length of time lived in the United States was represented by a continuous variable ($M = 17.77$, $S.D. = 9.56$), and English language ability was represented by the following dummy variables: parents who reported their primary language is English (reference category, $n = 9290$); parents who reported their primary language is not English but completed the interview in English ($n = 450$); parents who reported their primary language is not English and completed the interview in another language ($n = 380$). The inclusion of these variables did not substantively change the association between race and child care arrangements among immigrant parents. Length of time in the United States did not independently predict child care decisions. However, when a parent reported her primary language was not English, she was less likely to send her child to center-based care compared to parental care. Language ability was not associated with Head Start or other care.

The analyses in Table 3 were limited because they did not consider the ethnic origin of Hispanic or Asian children. In Table 4, we presented multinomial logistic regression models that compared the various child care arrangements of Hispanic and Asian ethnic groups to native-born whites. The ethnic groups were as follows: Mexican ($n = 940$), Puerto Rican ($n = 140$), Cuban ($n = 50$), other Hispanic ($n = 300$), Asian Indian ($n = 70$), Chinese ($n = 110$), Filipino ($n = 140$), Japanese ($n = 60$), Korean ($n = 60$), Vietnamese ($n = 40$), Hmong ($n = 40$), and other Asian ($n = 70$). Nativity, net of a host of individual-level factors, did predict child care arrangements. For example, Chinese children were more likely than white children to be enrolled in center-based care before kindergarten, compared to parental care, but Filipino children were less likely than white children to be enrolled in such care. Chinese children were also more likely than their white counterparts to receive other care, compared to parental care. Additionally, although Mexican, Puerto Rican, and Cuban children were enrolled in Head Start at similar rates as white children, other race Hispanic children were 1.7 times as likely as whites to receive such care.

3.2. Association between pre-kindergarten child care and behavioral outcomes

In Table 2, we ran two-tailed *T*-tests to compare the means of behavioral outcomes of minority and immigrant groups to the means of native-born whites. This table showed that minority immigrant parents, compared with native-born white parents, generally reported that their children have less favorable behavioral outcomes. The differences in the approaches to learning and social interaction scores were particularly striking. White foreign-born children and Asian native-born children were exceptions to this general pattern, as their behavior generally resembled that of native-born whites. Even among these race and immigrant groups, though, approaches to learning and social interaction scores were significantly lower than those of native-born whites. Minority and immigrant groups were least disadvantaged in their self-control; in fact, foreign-born white and Asian children had self-control scores higher than native-born white children.

Table 5 extended these bivariate associations with regression models that predict children's behavior. The first set of models showed that individual-level demographic or socioeconomic differences did not fully account for race and immigrant variation in behavioral outcomes of young children, although the strength and magnitude of the differences varied by the outcome. Compared with native-born whites, nearly all groups of children, particularly those with immigrant mothers, were disadvantaged in their approaches to learning and social interaction scores. Black and Hispanic native-born children had approaches to learning scores comparable to native-born whites. These two groups of children were also unique in that they had more favorable self-control behaviors, according to their parents, and Hispanic native-born children had better impulsive/overactive scores. The effect sizes of race and immigrant status were relatively modest. In the models predicting approaches to learning behaviors, for example, the differences between most minority immigrant children and native-born white children were between one-fourth and one-fifth of a standard deviation.

The addition of pre-kindergarten child care arrangements did little to change the association between race and immigrant status and behavioral outcomes. Some child care arrangements, however, were independently associated with children's behavior. Head Start attendance prior to kindergarten, compared to parental care, was associated with less favorable self-control and impulsive/overactive scores. Other care was also associated with less favorable outcomes among young children (self-control, sad/lonely, and impulsive/overactive). Center-based care, on the other hand, was not independently associated with behavioral outcomes.

Finally, the third set of models included interaction terms between pre-kindergarten child care arrangements and race and immigrant status. These interaction terms suggested that the association between child care arrangements and some behavioral outcomes varied by race and immigrant status. Though center-based care was not associated with approaches to learning scores, on average, the interaction terms suggested that center-based care was associated with more favorable approaches to learning scores among black native-born children and Asian foreign-born children. The other interaction terms predicting approaches to learning behavior did not reach statistical significance, but they were all in the same expected direction. Compared with white native-born children, center-based care was associated with better approaches to learning scores. Similarly, center-based care was associated with more favorable social interaction scores for black foreign-born and Hispanic foreign-born children (and the coefficients for the other groups go in the expected direction). On the other hand, for foreign-born whites, native-born Hispanics, and foreign-born Asians, center-based care was associated with less favorable self-control scores. Though not the main focus of our analysis, the association between Head Start and children's behavior, as well as the association between other care and children's behavior, varied by race and immigrant status. There is some evidence to suggest that attending Head Start prior to kindergarten was associated with worse self-control and impulsive/overactive scores for foreign-born Asians and worse social interaction for foreign-born Hispanics. However, native-born Asian children who attended Head Start received more favorable sad/lonely scores than their native-born white counterparts.

4. Discussion

We extend the school transition model to include children of immigrants and find that Hispanic foreign-born and Asian foreign-born children are less likely than their native-born white counterparts to be enrolled in center-based care prior to kindergarten compared to parental care. However, Hispanic foreign-born children enroll in center-based care at similar rates as their Hispanic native-born counterparts. Similarly, Asian foreign-born and Asian native-born children are equally likely to be enrolled in center-based care prior to kindergarten. The underrepresentation of immigrant children in center-based care is consistent with other research (Brandon, 2004; Magnuson et al., 2006). We extend the work of Magnuson et al. (2006) by considering both race and immigrant status jointly, and find that immigrant children of different race groups have strikingly different pre-kindergarten child care arrangements. We also find that, among Asians, ethnicity is an important predictor of child care usage, with Chinese parents being more likely than whites to enroll their children in center-based care and Filipino parents being less likely to enroll their children in such care.

The lower incidence of Hispanic and Asian immigrant children in center-based care may be the result of economic barriers to formal care or cultural preferences for informal care (Brandon, 2004; Fuller, 2007). As immigrant families tend to be of lower socioeconomic status than native-born families, on average, costs to attend center-based care may be beyond the budget of many families. Asian immigrants in this sample, however, have comparable income as native-born whites, so this explanation may only apply to Hispanic immigrant families. Among Asian immigrant families, lower rates of center-based care may be due to a possible cultural preference for other types of child care regardless of socioeconomic status.

Table 5

OLS regression models predicting children's behavioral outcomes at the beginning of kindergarten.

Variable	Approaches to learning			Self-control			Social interaction			Sad/lonely			Impulsive/overactive		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Race/immigrant status															
White native-born (reference)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
White foreign-born	-0.08**	-0.08**	-0.11	0.04	0.03	0.17*	-0.10**	-0.10**	-0.14	0.00	0.00	-0.01	-0.02	-0.01	0.05
	(0.03)	(0.03)	(0.07)	(0.03)	(0.03)	(0.07)	(0.03)	(0.03)	(0.08)	(0.02)	(0.02)	(0.05)	(0.04)	(0.04)	(0.09)
Black native-born	-0.02	-0.11	-0.12**	0.10***	0.11***	0.15***	-0.02	-0.02	0.00	0.02	0.02	0.04	0.13***	0.12***	0.08
	(0.02)	(0.02)	(0.04)	(0.02)	(0.02)	(0.04)	(0.02)	(0.02)	(0.05)	(0.01)	(0.01)	(0.03)	(0.02)	(0.02)	(0.06)
Black foreign-born	-0.13**	-0.13**	-0.29**	0.09	0.09	0.17	-0.10	-0.10	-0.27*	-0.05	-0.05	-0.04	0.01	0.01	0.11
	(0.05)	(0.05)	(0.10)	(0.05)	(0.05)	(0.11)	(0.06)	(0.06)	(0.12)	(0.04)	(0.04)	(0.08)	(0.07)	(0.07)	(0.14)
Hispanic native-born	-0.03	-0.03	-0.09*	0.06**	0.06**	0.15***	-0.01	-0.01	-0.03	-0.03	-0.03	-0.06	-0.08**	-0.08**	-0.09
	(0.02)	(0.02)	(0.04)	(0.02)	(0.02)	(0.05)	(0.02)	(0.02)	(0.05)	(0.02)	(0.02)	(0.04)	(0.03)	(0.03)	(0.06)
Hispanic foreign-born	-0.11***	-0.11***	-0.13***	0.02	0.02	0.03	-0.19***	-0.19***	-0.27***	-0.06**	-0.06*	-0.07*	-0.04	-0.03	-0.01
	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)	(0.04)	(0.02)	(0.02)	(0.03)	(0.04)	(0.04)	(0.05)
Asian native-born	-0.12*	-0.12*	-0.21	0.04	0.04	0.04	-0.11	-0.11	-0.06	0.03	0.03	-0.05	-0.09	-0.09	-0.14
	(0.05)	(0.05)	(0.11)	(0.06)	(0.06)	(0.12)	(0.06)	(0.06)	(0.13)	(0.04)	(0.04)	(0.09)	(0.07)	(0.07)	(0.16)
Asian foreign-born	-0.12***	-0.12***	-0.19***	0.06	0.06	0.12*	-0.16***	-0.16***	-0.17***	0.10***	0.10***	0.05	0.03	0.03	-0.02
	(0.03)	(0.03)	(0.05)	(0.03)	(0.03)	(0.05)	(0.03)	(0.03)	(0.06)	(0.02)	(0.02)	(0.04)	(0.04)	(0.04)	(0.07)
Primary type of pre-kindergarten child care															
Parental care (reference)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Center-based care	0.00	-0.04*		-0.02	0.00		0.00	-0.02		0.01	0.01		0.01	-0.02	
	(0.01)	(0.02)		(0.01)	(0.02)		(0.02)	(0.02)		(0.01)	(0.01)		(0.02)	(0.02)	
Head Start	-0.03	-0.01		-0.09***	-0.12***		-0.01	-0.01		0.02	0.02		0.09**	0.13**	
	(0.02)	(0.03)		(0.02)	(0.03)		(0.02)	(0.04)		(0.02)	(0.03)		(0.03)	(0.04)	
Other care	-0.02	-0.04*		-0.05**	-0.02		-0.02	-0.04*		0.04**	0.03		0.05*	0.04	
	(0.02)	(0.18)		(0.02)	(0.02)		(0.02)	(0.02)		(0.01)	(0.02)		(0.02)	(0.03)	
Primary type of pre-kindergarten child care × race/immigrant status															
Center-based care × white native-born (reference)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Center-based care × white foreign-born		0.06			-0.18*			0.04			0.01			-0.10	
		(0.07)			(0.08)			(0.09)			(0.06)			(0.10)	
Center-based care × black native-born		0.16***			-0.02			-0.01			-0.04			0.00	
		(0.05)			(0.05)			(0.05)			(0.04)			(0.07)	
Center-based care × black foreign-born		0.09			-0.11			0.29*			0.02			-0.16	
		(0.12)			(0.13)			(0.14)			(0.10)			(0.17)	
Center-based care × Hispanic native-born		0.06			-0.16**			-0.04			0.07			-0.01	
		(0.05)			(0.06)			(0.06)			(0.04)			(0.07)	
Center-based care × Hispanic foreign-born		0.05			0.02			0.13**			-0.03			-0.09	
		(0.04)			(0.05)			(0.05)			(0.04)			(0.06)	
Center-based care × Asian native-born		0.21			-0.01			0.02			-0.01			0.14	
		(0.13)			(0.14)			(0.15)			(0.11)			(0.19)	
Center-based care × Asian foreign-born		0.12*			-0.13*			0.04			0.09			0.12	
		(0.06)			(0.06)			(0.07)			(0.05)			(0.08)	
Head Start × white native-born (reference)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Head Start × white foreign-born		-0.20			-0.03			0.03			0.16			-0.04	
		(0.15)			(0.16)			(0.17)			(0.13)			(0.21)	
Head Start × black native-born		0.04			0.01			-0.08			-0.03			0.05	
		(0.06)			(0.06)			(0.06)			(0.05)			(0.08)	
Head Start × black foreign-born		0.15			0.00			0.11			0.04			-0.04	
		(0.17)			(0.18)			(0.20)			(0.14)			(0.24)	
Head Start × Hispanic native-born		0.05			0.00			0.05			-0.03			-0.07	
		(0.07)			(0.08)			(0.09)			(0.06)			(0.10)	
Head Start × Hispanic foreign-born		-0.01			0.05			0.16*			0.02			-0.09	
		(0.06)			(0.06)			(0.07)			(0.05)			(0.08)	

Table 5 (Continued)

Variable	Approaches to learning			Self-control			Social interaction			Sad/lonely			Impulsive/overactive		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Head Start × Asian native-born			0.53 (0.34)			−0.12 (0.37)			0.38 (0.40)			1.02*** (0.29)			−0.45 (0.48)
Head Start × Asian foreign-born			−0.13 (0.09)			0.31** (0.10)			−0.08 (0.10)			0.05 (0.07)			−0.42*** (0.13)
Other care × white native-born (reference)			–			–			–			–			–
Other care × white foreign-born			−0.02 (0.09)			−0.13 (0.10)			0.06 (0.11)			−0.02 (0.08)			−0.01 (0.13)
Other care × black native-born			0.08 (0.05)			−0.09 (0.05)			−0.02 (0.06)			−0.01 (0.04)			0.07 (0.07)
Other care × black foreign-born			0.44** (0.15)			−0.12 (0.16)			0.08 (0.17)			−0.12 (0.12)			−0.12 (0.20)
Other care × Hispanic native-born			0.10 (0.06)			−0.09 (0.06)			0.11 (0.64)			0.04 (0.05)			0.07 (0.08)
Other care × Hispanic foreign-born			−0.01 (0.05)			0.00 (0.05)			0.08 (0.05)			0.06 (0.04)			0.02 (0.07)
Other care × Asian native-born			−0.11 (0.15)			0.02 (0.17)			−0.27 (0.18)			0.26* (0.13)			−0.05 (0.22)
Other care × Asian foreign-born			0.08 (0.07)			−0.10 (0.07)			−0.01 (0.08)			0.04 (0.06)			0.16 (0.09)
Constant	2.68***	2.70***	2.72***	2.32***	2.37***	2.35***	2.89***	2.90***	2.92***	1.59***	1.57***	1.57***	2.77***	2.71***	2.71***
Adjusted R ²	0.06	0.06	0.06	0.03	0.03	0.04	0.06	0.06	0.06	0.02	0.02	0.02	0.07	0.07	0.07
N	10,410	10,410	10,410	10,410	10,410	10,410	10,410	10,410	10,410	10,410	10,410	10,410	10,410	10,410	10,410

Note: Analyses weighted to account for sampling design. Robust standard errors in parentheses. All models include all covariates from Table 3. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Additionally, it is possible that immigrant parents face cultural barriers when attempting to enroll their children in formal child care (Buriel & Hurtado-Ortiz, 2000), or that they may forego formal care to provide cultural and linguistic support they deem valuable to their children.

Additionally, Hispanic foreign-born children are less likely to be enrolled in Head Start. It is possible that this group has less access to Head Start centers than their counterparts or simply has a cultural preference for parental care. Or, it is possible that undocumented or illegal immigrant parents do not feel they can take advantage of the government-sponsored programs for which their native-born children qualify (e.g., Head Start), even if the children are legal citizens, for fear of deportation or prosecution (Suarez-Orozco & Suarez-Orozco, 2001). We also find that Hispanic foreign-born and Asian foreign-born children are less likely to receive other types of care before kindergarten, compared to parental care. One explanation for these striking differences may be because many children who receive this type of care are cared for by a relative, and foreign-born parents may have fewer relatives to provide this support.

Turning to our second research question, we find that attending center-based care prior to kindergarten is not significantly associated with children's behavioral outcomes at the beginning of kindergarten. The lack of association between center-based child care and behavioral outcomes is inconsistent with other research that finds that center-based care, particularly early in a child's life, may hinder children's behavioral development (Belsky et al., 2007; Crosnoe, 2007; Gormley & Gayer, 2005; Loeb et al., 2007). In our analyses, the lack of association between center-based care and children's behavior may be due to our limited measurement of pre-kindergarten child care arrangements. We only look at child care arrangements the year before the child entered kindergarten and do not include other factors such as age at entry into child care, number of hours spent per week in child care, or child care history. Thus, it is possible that the negative behavioral consequences of center-based care are underestimated in our models, which suggests that the variation by race and immigrant status is also underestimated.

Head Start attendance, however, is associated with less favorable self-control and impulsive/overactive behavior. Children who receive other care, compared to parental care, also tend to have less favorable behavioral outcomes. We caution putting too much emphasis on these findings, both because of the selection associated with Head Start attendance (Currie & Thomas, 1995) and because the quality of other types of care arrangements may vary dramatically. On the other hand, because there is less variation in the quality of Head Start centers than in the quality of other center-based care, our findings about Head Start may be particularly robust.

Pre-kindergarten child care arrangements, however, do little to alter the variation in behavioral outcomes by race and immigrant status. Regardless of child care arrangements before kindergarten, there are striking differences in behavioral outcomes between native-born white children and minority immigrant children, particularly Blacks and Hispanics. Consistent with other research, however, the direction and magnitude of these differences depends on the outcome in question (Crosnoe, 2006). These differences may be real, but it is also possible that minority immigrant parents hold different norms about appropriate behavior and thus interpret the questions differently than native-born white parents.

Finally, we find that the association between center-based care and children's behavior varies by race and immigrant status. Particularly with regard to approaches to learning scores and social interactions scores, there is some evidence that center-based child care may be more beneficial to them than to their native-born white counterparts. These findings are consistent with suggestions that child care may not be negatively associated with behavior for all groups of children (Loeb et al., 2007). Center-based child care may provide minority immigrant children the tools necessary for success in kindergarten, as these care arrangements may closely approximate the school environment that students face in kindergarten (Lee & Burkam, 2002). Center-based care may also allow children the opportunity to learn appropriate rules and become comfortable with their student role (Alexander & Entwisle, 1988).

Several limitations must be kept in mind when interpreting our results. Child care arrangements are based on parental reports and, as discussed earlier, data limitations preclude us from considering child care quality. Also, these data do not follow children from birth, so we cannot look at the extent to which children move in and out of various child care arrangements. Many children do not, in fact, have stable and consistent early child care experiences, and child care arrangements may change when family circumstances change (NICHD ECCRN, 2004). Finally, we do not establish a causal relationship between race and immigrant status and child care arrangements or between child care arrangements and behavioral outcomes. Parents' cultural preferences or financial circumstances may drive some of the variation in children's experiences (Fuller, 2007). Further, with respect to behavioral outcomes, it is possible unobserved may influence both pre-kindergarten child care arrangements and behavioral outcomes. We include a number of covariates in our analyses in order to minimize these possible selection effects, but can only establish an association between race and immigrant status, child care arrangements, and children's behavior.

Minority children and children of immigrants are a rapidly growing segment of youth in the United States, and policymakers will need to focus increasingly on their social, developmental, and cognitive needs to address the inequality that begins before children enter elementary school (Lee & Burkam, 2002). Our findings indicate that child care policies should focus on the barriers that children of immigrants and racial minorities face in enrolling in center-based care such as preschool. Additionally, formal child care centers must be aware of barriers that exist once children are enrolled in such care. We recommend outreach efforts designed to overcome language, cultural, and economic barriers in order to allow underachieving immigrant groups, specifically children of Hispanic and Black immigrants, access to child care settings that are able to prepare their children more adequately for the beginning of kindergarten.

References

- Administration for Children and Families. (2006). *Child care bureau*. Retrieved August 24, 2006, from the World Wide Web: <http://www.acf.hhs.gov/programs/ccb/research/index.htm>.
- Alexander, K., & Entwisle, D. (1988). *Achievement in the first two years of school: Patterns and processes*. Chicago, IL: University of Chicago Press.
- Belsky, J., Vandell, D. L., Burchinal, M., Clarke-Stewart, K. A., McCartney, K., Owen, M. T., et al. (2007). Are there long-term effects of early child care? *Child Development, 78*, 681–701.
- Brandon, P. D. (2004). The child care arrangements of preschool-age children in immigrant families in the United States. *International Migration, 42*, 65–85.
- Burchinal, M. R. (1999). Child care experiences and development outcomes. *Annals of the American Academy of Political and Social Science, 563*, 73–97.
- Burriel, R., & Hurtado-Ortiz, M. T. (2000). Child care practices and preferences of native- and foreign-born Latina mothers and Euro-American mothers. *Hispanic Journal of Behavioral Sciences, 22*, 314–331.
- Buyse, V., Castro, D. C., West, T., & Skinner, M. (2005). Addressing the needs of Latino children: A national survey of state administrators of early childhood programs. *Early Childhood Research Quarterly, 20*, 146–163.
- Crosnoe, R. (2005). Double disadvantage or signs of resilience? The elementary school contexts of children from Mexican immigrant families. *American Educational Research Journal, 42*, 269–303.
- Crosnoe, R. (2006). Health and the education of children from racial/ethnic minority and immigrant families. *Journal of Health and Social Behavior, 47*, 77–93.
- Crosnoe, R. (2007). Early child care and the school readiness of children from Mexican immigrant families. *International Migration Review, 41*, 152–181.
- Currie, J., & Thomas, D. (1995). Does Head Start make a difference? *American Economic Review, 85*, 341–364.
- Early, D. M., & Burchinal, M. R. (2001). Early childhood care: Relations with family characteristics and preferred care characteristics. *Early Childhood Research Quarterly, 16*, 475–497.
- Entwisle, D. R., & Alexander, K. L. (1993). Entry into school: The beginning school transition and educational stratification in the United States. *Annual Review of Sociology, 19*, 401–423.
- Fuller, B. (2007). *Standardized childhood: The political and cultural struggle over early education*. Stanford, CA: Stanford University Press.
- Fuller, B., Holloway, S. D., Rambaud, M., & Eggers-Pierola, C. (1996). How do mothers choose child care? Alternative cultural models in poor neighborhoods. *Sociology of Education, 69*, 83–104.
- Gormley, W. T., & Gayer, T. (2005). Promoting school readiness in Oklahoma: An evaluation of Tulsa's Pre-K program. *The Journal of Human Resources, 70*, 533–558.
- Gormley, W. T., & Phillips, D. (2005). The effects of universal Pre-K in Oklahoma: Research highlights and policy implications. *Policy Studies Journal, 33*, 65–82.
- Hernandez, D. J. (1997). Child development and the social demography of childhood. *Child Development, 68*, 149–169.
- Kao, G., & Tienda, M. (1995). Optimism and achievement: The educational performance of immigrant youth. *Social Science Quarterly, 76*, 1–19.
- Knoester, C. (2003). Implications of childhood externalizing problems for young adults. *Journal of Marriage and Family, 65*, 1073–1080.
- Lee, V. E., & Burkam, D. T. (2002). *Inequality at the starting gate: Social background differences in achievement as children begin school*. Washington, DC: Economic Policy Institute.
- Liang, X., Fuller, B., & Singer, J. D. (2000). Ethnic differences in child care selection: The influence of family structure, parental practices, and home language. *Early Childhood Research Quarterly, 15*, 357–384.
- Lin, H. L., Lawrence, F. R., & Gorrell, J. (2003). Kindergarten teachers' views of children's readiness for school. *Early Childhood Research Quarterly, 18*, 225–237.
- Loeb, S., Bridges, M., Bassok, D., Fuller, B., & Rumberger, R. W. (2007). How much is too much? The influence of preschool centers on children's social and cognitive development. *Economics of Education Review, 26*, 52–66.
- Loeb, S., Fuller, B., Kagan, S. L., & Carrol, B. (2004). Child care in poor communities: Early learning effects of type, quality, and stability. *Child Development, 75*, 47–65.
- Magnuson, K. A., Lahaie, C., & Waldfogel, J. (2006). Preschool and school readiness of children of immigrants. *Social Science Quarterly, 87*, 1241–1262.
- Magnuson, K. A., Meyers, M. K., Ruhm, C. J., & Waldfogel, J. (2004). Inequality in preschool education and school readiness. *American Educational Research Journal, 41*, 115–157.
- Magnuson, K. A., Ruhm, C. J., & Waldfogel, J. (2007). Does prekindergarten improve school preparation and performance? *Economics of Education Review, 26*, 33–51.
- McLeod, J., & Kaiser, K. (2004). Childhood emotional and behavioral problems and educational attainment. *American Sociological Review, 69*, 636–658.
- National Center for Education Statistics. (2001). *User's guide to the longitudinal kindergarten-first grade public-use data file*. Washington, DC: U.S. Department of Education. (NCES 2002-149 Revised).
- NICHD Early Child Care Research Network. (1997). Familial factors associated with the characteristics of nonmaternal care for infants. *Journal of Marriage and the Family, 59*, 389–408.
- NICHD Early Child Care Research Network. (1998). Early child care and self-control, compliance, and problem behavior at twenty-four and thirty-six months. *Child Development, 69*, 1145–1170.
- NICHD Early Child Care Research Network. (2000). The relation of child care to cognitive and language development. *Child Development, 71*, 960–980.
- NICHD Early Child Care Research Network. (2004). Type of child care and children's development at 54 months. *Early Childhood Research Quarterly, 19*, 203–230.
- Nord, C. W., & Griffin, J. A. (1999). Educational profile of 3- to 8-year-old children of immigrants. In D. Hernandez (Ed.), *Children of immigrants: Health, adjustment and public assistance* (pp. 348–409). Washington, DC: National Academy Press.
- O'Hare, W. (2004). *Trends in the well-being of America's children*. New York & Washington, DC: Russell Sage Foundation & Population Reference Bureau.
- Portes, A., & Rumbaut, R. G. (2001). *Legacies: The story of the immigrant second generation*. Berkeley, CA & New York, NY: University of California Press & Russell Sage Foundation.
- Radey, M., & Brewster, K. L. (2007). The influence of race/ethnicity on disadvantaged mothers' child care arrangements. *Early Childhood Research Quarterly, 22*, 379–393.
- Rock, D. A., & Pollack, J. M. (2002). *Early childhood longitudinal study-kindergarten class of 1998-99 (ECLS-K): Psychometric report for kindergarten through first grade*. Washington, DC: U.S. Department of Education, NCES.
- Rumbaut, R. G., & Portes, A. (2001). Introduction: Ethnogenesis: Coming of age in immigrant America. In R. Rumbaut, & A. Portes (Eds.), *Ethnicities: Children of immigrants in America* (pp. 1–19). New York: Russell Sage Foundation.
- Shanahan, M. J. (2000). Pathways to adulthood in changing societies: Variability and mechanisms in life course perspective. *Annual Review of Sociology, 26*, 667–692.
- Spain, D., & Bianchi, S. M. (1996). *Balancing act: Motherhood, marriage, and employment among American women*. New York: Russell Sage Foundation.
- Suarez-Orozco, Carola, & Suarez-Orozco, Marcelo M. (2001). *Children of immigration*. Cambridge, MA: Harvard University Press.
- U.S. Department of Health and Human Services. (2003). *Strengthening Head Start: What the evidence shows*. Retrieved June 24, 2009, from the World Wide Web: <http://aspe.hhs.gov/hsp/StrengthenHeadStart03/index.htm>.
- Wesley, P. W., & Buyse, V. (2003). Making meaning of school readiness in schools and communities. *Early Childhood Research Quarterly, 18*, 351–375.
- Zhou, M. (1997). Growing up American: The challenge confronting immigrant children and children of immigrants. *Annual Review of Sociology, 23*, 63–95.