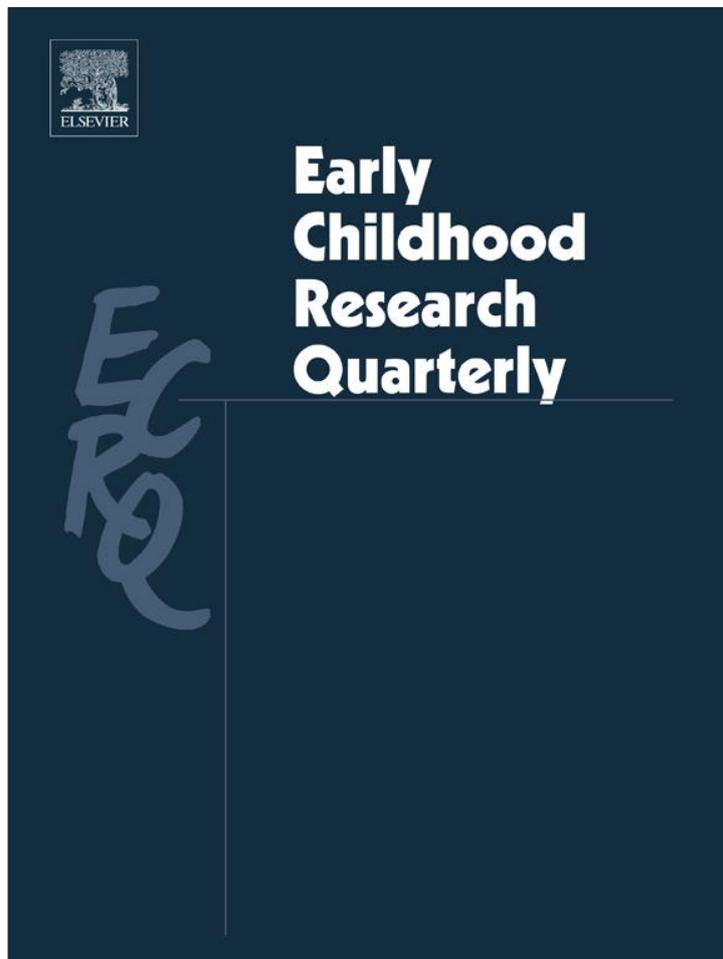


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# The role of access to Head Start and quality ratings for Spanish-Speaking Dual Language Learners' (DLLs) participation in early childhood education<sup>☆</sup>

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## ABSTRACT

Data from the Head Start Impact Study ( $N=4442$ ) were used to test for differences between Spanish-speaking Dual Language Learners (DLLs) and monolingual English-speaking children in: (1) Head Start attendance rates when randomly assigned admission; and (2) quality ratings of other early childhood education (ECE) programs attended when not randomly assigned admission to Head Start. Logistic regressions showed that Spanish-speaking DLL children randomly assigned a spot in Head Start were more likely than monolingual-English learners to attend. Further, Spanish-speaking DLLs not randomly assigned a spot in Head Start were more likely to attend higher-quality ECE centers than non-DLL children. Policy implications are discussed, suggesting that, if given access, Spanish-speaking DLL families will take advantage of quality ECE programs.

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## 1. Introduction

With the number of U.S. children who come from homes where English is not the primary language rapidly growing (National Clearinghouse for English Language Acquisition, 2011), it is increasingly important that such students are equipped to succeed academically. However, research shows that at the beginning of kindergarten, Dual Language Learners (DLLs) trail their monolingual English-speaking peers in key academic skills such as English language that predict future English literacy and academic success – a gap that continues throughout schooling (Lee & Burkam, 2002). Compounding the matter is that many DLL children come from low-income families, an additional risk factor for delayed English language development (Hart & Risley, 1995; Kieffer, 2010; Mancilla-Martinez & Vagh, 2013). The majority of DLLs come from Spanish-speaking homes (García, 2012), and

Hispanic children constitute the greatest population of children living in poverty (Lopez & Velasco, 2011), placing this group doubly at risk for delayed English skills (Mancilla-Martinez & Vagh, 2013).

Early childhood education (ECE) has been shown to help prepare young learners for future academic success (Karoly, Kilburn, & Cannon, 2005; Magnuson, Ruhm, & Waldfogel, 2007); this may be especially true for low-income children (Barnett, 2011; Ramey & Ramey, 2006; Schweinhart, 2006). Research suggests that perhaps the largest beneficiaries of ECE programs are children whose English language skills are the weakest (Buyse, Peisner-Feinberg, Pérez, Hammer, & Knowles, 2013). It is therefore critical to provide the growing segment of Spanish-speaking DLLs with access to quality ECE programs so they can enter kindergarten with early English language skills that will support their future English literacy development and academic success (Espinosa, 2013; National Task Force on Early Childhood Education for Hispanics, 2007). Census data, however, indicate that the majority of Hispanic families do not participate in formal ECE programs; rather, they utilize familial care over center-based care options such as Head Start (Laughlin, 2013). Further research suggests that the ECE programs that Spanish-speaking DLLs attend may be of lower quality than those that monolingual-English speakers attend (Espinosa, 2013).

This paper contributes to the growing body of research on the ECE participation patterns of Spanish-speaking DLLs. Using data from the Head Start Impact Study (HSIS; U.S. DHHS, 2002–2006),

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a large, nationally representative sample of Head Start-eligible children assigned at random to Head Start centers or a comparison group between 2002 and 2006, we examine: (1) the effects of access to Head Start (through random assignment) on the actual participation of Spanish-speaking DLLs; and (2) the quality of centers that Spanish-speaking DLLs, who were not offered a spot in Head Start, attended. Specifically, we seek to determine if there were differences in take-up rates and center quality attendance between Spanish-speaking DLLs and their monolingual English-speaking peers. We aim to contribute to the ongoing inquiry of Spanish-speaking DLLs' access to and participation in quality ECE programs.

### 1.1. Dual Language Learners in the U.S.

We use the term “Dual Language Learner” (DLL) to describe students who are tasked with learning more than one language – their home language and English (Espinosa, 2013). This term encompasses the diversity of this population, which includes children from a wide variety of language backgrounds; young Dual Language Learners may be of limited English proficiency, bilingual, or may not fluently speak their home language (August & Hakuta, 1997). Regardless of their home language experiences, DLLs have less English language exposure and practice in early years than monolingual English-speaking children – children who come from homes where English is the primary language – and DLLs do not perform on par with such children on various emergent English skills (August & Shanahan, 2006). Further, persistent achievement gaps between the population of all DLLs and monolingual-English speakers (National Assessment of Educational Progress, 2011) suggest that young DLL children are not equipped with the English language skills to succeed academically. Underlining the English language and academic disparities between DLLs and monolingual English-speaking children is that the population of U.S. DLLs is rapidly growing. From 1994–1995 to 2009–2010, the number of school-aged DLLs in the U.S. increased by nearly 65% (NCELA, 2011) – from 3.2 million students to over 5.2 million students. Roughly 25% of U.S. children come from homes where a language other than English is spoken (Espinosa, 2013), and DLLs represent the fastest growing student segment in U.S. public schools (Calderón, Slavin, & Sánchez, 2011).

The majority of DLLs in the U.S. are Spanish-speaking; one in four students in U.S. elementary schools is of Hispanic descent (Fry & Lopez, 2012). Additionally, the population of Hispanic children represents the largest group of children in poverty in the U.S. (Lopez & Velasco, 2011), which further places Spanish-speaking DLLs at risk for delayed English language development (Hart & Risley, 1995; Hoff, 2013; Kieffer, 2010; Mancilla-Martinez & Vagh, 2013). Spanish-speaking DLL 4- and 5-year-olds perform one to two standard deviations below monolingual-English norms on measures of English vocabulary (Hoff, 2013). While an initial English language gap is understandable given the limited amount of home exposure to English (compared with monolinguals), vocabulary gaps between monolingual-English speakers and Spanish-speaking DLLs are still often significant at age 11 (Mancilla-Martinez & Lesaux, 2011). This is troubling given the link between early English language skills and future literacy, academic success, and improved social dispositions (Spira, Bracken, & Fischel, 2005).

The early childhood years are a critical period to equip Spanish-speaking DLLs with the English language skills that they will need for future English literacy and academic success (Hoff, 2013; Mancilla-Martinez & Vagh, 2013; National Task Force on Early Childhood Education for Hispanics, 2007), and therefore it is imperative that young Hispanic DLLs have access to quality ECE programs that support English language development.

### 1.2. Prior research on Spanish-speaking DLLs and early childhood education

#### 1.2.1. Theoretical framework

The current study is grounded in a framework that recognizes the importance of quality ECE programs for Spanish-speaking DLLs (Buysse et al., 2013; Espinosa, 2013; U.S. DHHS, Final Report, 2010; National Task Force on Early Childhood Education for Hispanics, 2007). We draw upon two non-mutually exclusive strands in the research on Spanish-speaking DLLs and early childhood programs. The first investigates participation patterns of DLLs in ECE programs (Buysse et al., 2013; Espinosa et al., 2013; Greenberg & Kahn, 2012; Laughlin, 2013; Vesely, 2013; Winsler, Robinson, & Thibodeaux, 2013), and the second looks at the quality of programs attended (Espinosa et al., 2013; Fuller & Kim, 2011). Research in both of these areas is mixed, and we seek to contribute to the two complementary bodies of literature as we utilize nationally representative Head Start data to examine Spanish-speaking DLLs' participation rates and the quality of ECE centers attended. The overarching theoretical question that we address is about access to quality ECE and has strong policy implications (i.e., if Spanish-speaking DLLs are given access to quality ECE programs, are they likely to attend?).

#### 1.2.2. Differential benefits of ECE for DLLs

Early childhood programs such as Head Start are intended to equip young learners, especially those from disadvantaged circumstances, with academic and behavioral skills that will better prepare them for kindergarten (U.S. DHHS, Head Start Bureau, 2012). Participation in high-quality ECE promotes positive child development in cognitive, socio-emotional, and language skills (Howes et al., 2008; Karoly et al., 2005; Vesely, 2013). Although there are advantages for all young learners who attend ECE programs, children who come from homes where a language other than English is spoken may particularly benefit from participating in ECE programs (Buysse et al., 2013; Espinosa, 2013).

Research indicates that improved English language skills is one of the greatest benefits of ECE for young DLLs (Espinosa, 2013). Hammer, Lawrence, and Miccio (2007) determined that DLLs who participated in Head Start showed improvements in receptive language and, by the end of kindergarten, performed on par with monolingual-English students in English reading abilities. Furthermore, the HSIS Final Report (U.S. DHHS, 2010) found that Spanish-speaking students who were offered the opportunity to participate in Head Start demonstrated gains in oral language, as measured by the Peabody Picture Vocabulary Test, Third Edition (PPVT; Dunn & Dunn, 1997). In a recent review of literature on the effects of ECE on DLLs (primarily those who were Spanish-speaking), Buysse et al. (2013) found that overall, Spanish-speaking DLLs benefitted from participating in Head Start, and there was evidence to suggest that children with weaker English abilities and less English exposure benefitted the most. This converges with earlier research suggesting that Latino preschoolers benefitted more from ECE than monolingual-English children or children from other subgroups, especially when the programs were of high quality (Gormley, 2008; Loeb, Bridges, Bassok, Fuller, & Rumberger, 2007).

#### 1.2.3. Lower DLL enrollment rates in ECE

Despite evidence illustrating the value of ECE for DLLs, there is a body of research indicating that some Hispanic families do not enroll their children in formal ECE programs (Buysse et al., 2013; Laughlin, 2013). Data from the Early Childhood Longitudinal Study-Kindergarten cohort (ECLS-K) indicate that DLL children attend preschool at lower rates than non-DLL children, and Spanish-speaking DLLs have the lowest participation rates (Kagan, 2009). According to Laughlin (2013), Hispanic families are more likely to utilize relative or familial care over non-relative or

center-based care, particularly compared with other subgroups. Additionally, Laughlin (2013) found that this is confounded by poverty; poorer families are less likely to utilize center-based care than higher-income families. These findings are similar to research on immigrant families' enrollment in ECE programs that indicate low-income immigrants are less likely to utilize center-based care than non-immigrants and those of higher-income levels (Hernandez, Denton, & Macartney, 2011).

Additional prior research on subgroup participation in ECE suggests that Hispanics are less likely than blacks and whites to enroll their children in ECE programs, as they rely more on grandparents or other relatives for child care (Fuller, Holloway, & Liang, 1996; Magnuson & Waldfogel, 2005). Beltrán (2011) reported that less than half (48%) of Latino 4-year-olds attend preschool programs, compared with 70% of white children and 69% of black children in the same age group. Furthermore, there is research to suggest that the preschool enrollment rates of Latinos decreased between 2005 and 2009, breaking a steady upward trend that had been climbing since the 1980s, whereas enrollment rates for black and white children remained steady during this time period (Fuller & Kim, 2011).

Not all evidence illustrates this pattern. In a nuanced nationally representative study of child care participation and race, Greenberg and Kahn (2012) found that for 3- to 5-year-old children, race or ethnicity alone did not predict usage of child-care programs, suggesting that, when controlling for factors such as income level, education level, and work force participation, Hispanic families did not vary greatly from whites in ECE participation. They also determined that young Hispanics were more likely to participate in ECE programs than blacks when controlling for similar characteristics. They reconciled their findings with those of previous studies by suggesting that their large number of predictors mitigated the impact of race.

Regional differences may also explain the variation in ECE participation patterns. For example, Winsler et al. (2013) research on Hispanic participation in ECE programs in the Miami, Florida region of the U.S. suggests that Hispanics are not necessarily less likely to utilize ECE than non-Hispanics. In addition to region and race, they also considered immigrant and linguistic factors; and, using logistic regressions, they determined that Spanish-speaking DLLs were not overrepresented in familial care. The authors reconciled these findings with previous research by suggesting potential regional differences; ECE participation behaviors may be different between Southeastern Hispanics and those from other parts of the country. This evidence reflects a problem with regarding Hispanics as a single group. Similarly, 2000 census data illustrate lower child care participation for Mexican children from both native-born and immigrant families, relative to other Hispanic groups such as Puerto Ricans, Dominicans, and Central Americans (Espinosa et al., 2013; Hernandez et al., 2011), indicating that country of origin may also influence ECE enrollment patterns.

#### 1.2.4. The quality of ECE programs attended by DLLs

In addition to differences in participation patterns, the quality of early education programs that Spanish-speaking DLLs attend varies widely (Fuller, Kagan, Loeb, & Chang, 2004; Kagan, 2009), and research on subgroup attendance in quality ECE is mixed. Some evidence indicates that low-income, Hispanic DLL families have less access to quality ECE and attend programs of inferior quality than other subgroups (Espinosa, 2013; Fuller & Kim, 2011). Fuller and Kim (2011), for example, examined 615 preschools in California and determined differences in the quality of ECE experiences between children from immigrant and non-immigrant families. Non-immigrant children participated in preschool programs rated higher in quality across all domains measured; however, the

difference between the two subgroups in each domain was only a fraction of one standard deviation difference.

Other research suggests that low-income Hispanic learners are not only more likely to enroll in early childhood programs, but they also attend programs of equal or better quality than other subgroups (Espinosa et al., 2013). In a study using the Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), Espinosa et al. (2013) ran both multivariate and logistic regressions comparing the child care selection behaviors of DLL (Spanish and other languages) and English-only families, controlling for a host of selection factors, and found no differences between DLLs and non-DLLs as to whether a child was in care, the type of care, the quality of care, or the time spent in the care.

#### 1.2.5. Access to ECE for DLLs

The mixed findings from research on Hispanic and low income DLLs' attendance in ECE and the quality of centers in which they enroll prompt the question of what role access to ECE plays in Spanish-speaking DLLs' participation. Policy reports indicate poor access to ECE programs as a major barrier to the participation of immigrants and low-income families, which largely consist of Hispanic DLLs (Espinosa, 2013; Hernandez et al., 2011). Empirical studies support this. For example, Fuller et al. (2004) used data from five U.S. cities to examine the impact of maternal characteristics on the quality of ECE programs that low-income children attended. They ran multivariate regressions of various maternal factors (e.g., ethnicity, English language skill, age, education, occupation) predicting the quality of centers in which they enrolled their children. The authors determined that the mother's city of residence was a more important predictor than any maternal characteristic, indicating the wide variability in the availability of quality ECE centers between different cities and suggesting that policymakers work to ensure that quality ECE programs are accessible for residents in all cities.

Additionally, access may extend beyond the location and availability of ECE programs. Using mixed methodology, Matthews and Jang (2007) determined three key factors of access that impact the ECE participation of children of immigrants: accessibility, awareness, and responsiveness. Not only are ECE programs not necessarily available in certain communities (accessibility), but also families may not be aware of their services (awareness), and further, the programs are not necessarily responsive to the linguistic and cultural needs of the community (responsiveness). This aligns with Vesely's (2013) qualitative analysis of interview data on the experiences of 40 low-income African and Latina immigrant mothers in an urban area of the U.S. and their selection and use of ECE programs. Vesely (2013) examined the relationship between structural (economic, social, and political factors that impact access) and cultural (beliefs and values that shape child-rearing decisions) influences and determined that this interplay, as well as country of origin and immigrant status and experience, shaped the mothers' usage of ECE programs. Vesely's research, as well as other research on Spanish-speaking DLLs' access to quality ECE programs, has important implications for policymakers as they determine resources for and operational practices of current and future ECE programs.

#### 1.2.6. The role of Head Start

As the largest federal means-tested ECE program, Head Start is of particular interest to policymakers. In 2012, Head Start received \$7.97 billion in funding (U.S. DHHS, Head Start Bureau, 2012) and served nearly 825,000 children – about 20% of all children in regular, center-based care (Barnett, Carolan, Fitzgerald, & Squires, 2012). Head Start's mission is to promote the school readiness of children from low-income families by providing them with academic, health, socio-emotional, and other services (U.S. DHHS, Head Start

Bureau, 2012). Since its inception in 1965, Head Start has served over 30 million children, birth to age five. In the 2011–2012 school year, most children enrolled in Head Start were ages three and four, and nearly half of the children spent more than six hours a day at least four days a week in the program. The quality of Head Start varies considerably across centers (U.S. DHHS, 2012); however, in the HSIS, the vast majority of Head Start children (about 70%) attended centers that were considered “good” quality or higher, whereas only 40% of control group children attended classrooms with such ratings (U.S. DHHS, Final Report, 2010).

Studies on the effects of Head Start have shown short-term achievement gains for participants (Duncan & Magnuson, 2013; U.S. DHHS, Final Report, 2010), and research using sibling fixed-effects analyses on the long-term impacts of Head Start suggests positive early adult outcomes (e.g., high school graduation, college attendance, idleness, crime, teen parenthood, health status) for participants (Deming, 2009). Nearly 40% of Early Head Start and Head Start children speak Spanish as their first language (U.S. DHHS, Head Start Bureau, 2012). Such DLLs appear to differentially benefit from Head Start; the HSIS Final Report (U.S. DHHS, 2010) found that the opportunity to participate in Head Start positively impacted the English oral language skills of DLL children.

### 1.3. Present study

Given the implications of ECE programs such as Head Start for the school readiness and English language skills of Spanish-speaking DLLs (Buysse et al., 2013; Espinosa, 2013; U.S. DHHS, Final Report, 2010), it is important for policymakers to understand the patterns of Spanish-speaking DLLs' participation in such programs. However, because the literature on Spanish-speaking DLLs' enrollment in ECE and quality programs remains unclear, more research is needed in this area to fully adjudicate the differences between opportunities for quality ECE programs and how Spanish-speaking DLLs access them.

Using existing HSIS data from a nationally representative sample of Head Start centers and eligible children, we examined if Spanish-speaking DLLs who were given access to Head Start programs through a random assignment lottery accepted the opportunity to attend, as compared with monolingual English-speaking children, by analyzing take-up rates. We also addressed the question of the quality of ECE programs in which Spanish-speaking DLLs participated by examining the classroom quality that those who were *not* given the opportunity to participate in a Head Start center, attended.

Because our study takes advantage of a random assignment experiment, albeit in an unconventional way, it has unique strengths. Unlike prior observational studies that may have non-random acceptance into programs even once observable participant selection factors are taken into account, the HSIS provided the same opportunity set of care (access to Head Start) to all children if they were randomly assigned to a center. Thus, we are able to exploit the randomization that ensures the selection into Head Start centers was equal for the children who enrolled in the random assignment pool to understand DLL attendance patterns when access is no longer a barrier to participation.

This study was consequently guided by two specific research questions:

- (1) If given access to a Head Start center through random assignment, are Spanish-speaking DLLs more or less likely to attend Head Start than monolingual-English speakers?
- (2) If not given access to a Head Start center through random assignment, are Spanish-speaking DLLs more or less likely

to attend higher-quality center-based care than monolingual-English speakers?

## Method

### Participants

We analyzed data from the HSIS, a nationally representative sample of 84 Head Start grantee and delegate agencies and nearly 5000 newly entering, eligible 3- and 4-year-old children. Children were randomly assigned to either: (1) a Head Start group that had access to Head Start program services; or (2) a control group that was not eligible to enroll in the Head Start center to which they applied for the lottery, but could enroll in other early childhood programs or services selected by their parents, including other Head Start centers not in the study (U.S. DHHS, Final Report, 2010).

The study employed a multi-stage sampling process to select a nationally representative group of Head Start programs and children. It began with a list of 1715 grantee and delegate Head Start agencies that were operating in the Fiscal Year (FY) 1998–1999. This pool was then organized into 161 geographic clusters across 25 strata in order to ensure variation across region of the country, urban and rural location, race and ethnicity, and state pre-kindergarten and child care policies. One cluster was then randomly selected from each of the 25 strata, yielding 261 grantee and delegate agencies. Agencies that had recently closed, merged, or were serving all eligible children in their communities were eliminated, and smaller agencies were grouped together. Approximately three grantee and delegate agencies were then randomly selected from each of the 25 strata, yielding a final number of 84 grantee and delegate agencies.

These 84 Head Start agencies generated lists of 1427 individual centers that were expected to be in operation for the 2002–2003 school year. After individual programs were eliminated because they had recently closed, merged, or were serving all eligible children in their communities, and groups of centers were stratified along the same dimensions as the geographical agency clusters, 383 individual centers remained from the 84 agencies (U.S. DHHS, Final Report, 2010). An average of four centers were selected from each agency with a range of 1–7 centers (C. Heid, personal communication, 10 April, 2013).

Once the centers were selected, a lottery process was used to determine which children were and were not offered a place in a specific Head Start center. The goal was to randomly select 27 children from each center – 16 to be assigned to Head Start and 11 to the control condition. In total, 4442 children were randomly selected – 2646 for Head Start and 1796 for the control condition. The resulting HSIS was representative of 84.5% of the total population of newly entering 3- and 4-year-old children in Head Start across the country (U.S. DHHS, Final Report, 2010). Data collection took place from fall 2002, at the time the treatment group entered Head Start, until spring 2006, at the end of first grade (U.S. DHHS, Final Report, 2010).

Approximately 25% of the total HSIS study sample ( $N=1141$ ) was classified as Spanish-speaking DLLs (see Measures, below) – 690 in Head Start and 451 in the control condition. Half of the children in this subgroup sample were male, and about 10% were classified as having a disability at baseline, with similar percentages for monolingual English-speaking children. On baseline PPVT measures, monolingual English-speaking children scored about half of a standard deviation below national norms, whereas Spanish-speaking DLLs scored over a full standard deviation below national monolingual-English norms ( $M=100$ ,  $SD=15$ ). On the baseline *Test de Vocabulario en Imágenes Peabody* (TVIP; Dunn, Lugo, Padilla, & Dunn, 1986), Spanish-speaking DLLs scored about 2/3 of a standard

deviation below monolingual-Spanish norms ( $M = 100$ ,  $SD = 15$ ). Nearly 70% of the mothers of Spanish-speaking DLL children had less than a high school education, and about 60% had immigrated to the U.S. in the past 10 years. The corresponding numbers for mothers of monolingual English-speaking children were 30% and 4%, respectively. The majority of Spanish-speaking DLL mothers were married (63%), and in 75% of Spanish-speaking DLL households, the biological parents lived together with the study child. In contrast, only 40% of mothers of monolingual English-speaking children were married, and only in 43% of monolingual English-speaking households did both biological parents live with the child.

Descriptive statistics for both Spanish-speaking DLLs as well as monolingual-English speakers in the study are displayed in Table 1, which also includes tests for treatment and control group differences within each of these subgroups. As shown in the table, balance was achieved on all covariates between the Head Start and control groups for both subgroups. Though we looked within treatment and control conditions to examine differences between Spanish-speaking DLLs and monolingual-English speakers, the randomization of the HSIS helped ensure that the children within each of these exogenous subgroup experimental conditions were comparable to one another, or equal in expectation (Murnane & Willett, 2011).

Measures

Spanish-speaking Dual Language Learner (DLL) status

Prior to program entry in the fall of 2002, treatment and control group children were administered a battery of assessments as a baseline measure of academic achievement. The language of this child assessment was chosen by HSIS as follows. At the start of the study in fall 2002, information was collected on each child's language ability. Assessors asked the child's primary caregiver three questions: (1) What language does the child speak most often at home?; (2) What language does the child speak most often at this child care setting?; and (3) What language does it appear this child prefers to speak? Children were tested in the language in which at least two of the three responses were the same (U.S. DHHS, Technical Report, 2010). A child who was tested in English at baseline was considered proficient in English for HSIS purposes, regardless of the language spoken at home, because their English language skills were good enough for the cognitive demands of the assessment battery. For the purposes of our study, we consider these children to be monolingual-English speakers. A child was classified as a DLL if they required assessment in a language other than English at baseline. About 25% of the overall study sample required baseline assessment in Spanish ( $N = 1141$ ) and as such were classified as Spanish-speaking DLLs. Very few children ( $N = 54$ ) were unable to be assessed at baseline in either English or Spanish and were instead given non-verbal assessments through a translator (U.S. DHHS, Technical Report, 2010). Because we do not have comparable baseline assessment data for these children and because our study focuses specifically on Spanish-speaking DLL children, these other children were dropped from the analytic sample.

The complete baseline English assessment battery included the CTOPPP Elision (Lonigan, Wagner, Torgesen, & Rashotte, 2002); McCarthy Draw-A-Design (McCarthy, 1970, 1972); Color Identification (Mason & Stewart, 1989); Counting Bears (Mason & Stewart, 1989); the PPVT; and the Woodcock-Johnson (WJ) III Tests of Achievement (Woodcock, McGrew, & Mather, 2001). Children requiring baseline assessment in Spanish were administered Spanish versions of the CTOPPP Elision, McCarthy Draw-A-Design, Color Identification, and Counting Bears; the TVIP; the *Batería Woodcock-Muñoz Pruebas de Aprovechamiento-Revisada* (Woodcock & Muñoz-Sandoval, 1996), as well as two English tests – the PPVT

Table 1  
Descriptive statistics – background and demographic characteristics by Spanish-speaking DLL status.

	Spanish-speaking Dual Language Learner						Monolingual-English speaker									
	Head Start			Control			Head Start			Control						
	N	Mean/% of Sample	SD	Range	N	Mean/% of Sample	SD	Range	N	Mean/% of Sample	SD	Range	N	Mean/% of Sample	SD	Range
Child characteristics – baseline (Fall 2002)																
Age at Spring 2003 assessment in weeks	690	238.05	31.43	178–327	451	241.30	25.98	170–309	1956	235.58	31.23	172–301	1345	234.77	27.37	169–333
Age-4 cohort	690	0.54			451	0.55			1956	0.44			1345	0.42		
Gender – male	690	0.48			451	0.47			1956	0.49			1345	0.51		
Disability	690	0.08			451	0.09			1956	0.14			1345	0.12		
Family characteristics – baseline (Fall 2002)																
Caregiver age	690	30.02	6.61	18–59	451	29.94	5.06	19–51	1956	29.13	8.43	16–78	1345	28.73	6.62	16–68
Maternal Education	690	0.62			451	0.70			1956	0.28			1345	0.30		
Less than high school		0.21				0.21				0.37				0.36		
High school diploma/GED		0.16				0.09				0.36				0.34		
Beyond high school		0.63				0.63				0.39				0.40		
Married mother	690	0.09			451	0.08			1956	0.17			1345	0.18		
Teenage mother	690	0.78			451	0.75			1956	0.41			1345	0.43		
Parents lived together	690	0.59			451	0.61			1956	0.06			1345	0.04		
Recent immigrant mother	690	0.13			451	0.14			1956	0.23			1345	0.20		
Maternal depression <sup>a</sup>	690	0.13			451	0.14			1956	0.23			1345	0.20		
Academic achievement – baseline (Fall 2002)																
PPVT	564	84.55	7.03	67–110	298	84.79	5.86	64–103	1683	93.57	8.83	70–129	998	93.92	7.74	70–134
TVIP	564	88.83	12.07	64–130	298	90.28	9.41	66–131								

Note. *t*-tests for differences in means were conducted for continuous variables, chi-square tests for categorical variables.

<sup>a</sup> Composited from CES-D Depression Scale. Weight used = CHSPR2003WTCA.

and the WJ III Letter-Word Identification test. In spring 2003, and in all subsequent data collection periods, all children were tested using the complete English assessment battery, and Spanish-speaking DLLs were no longer assessed in Spanish (U.S. DHHS, Technical Report, 2010).

#### *Head Start take-up rate*

Although every effort was made to ensure complete compliance with random assignment, study administrators determined that about 19% of children randomly assigned to a Head Start center did not actually attend at any time during the 2002–2003 program year. These children were referred to as “no-shows.” The study take-up rate therefore was  $[1 - (\text{percent “no-shows”})]$ , or the percentage of children who actually attended the Head Start program when they were given access to it through random assignment. As such, the overall take-up rate in the study was 81% (U.S. DHHS, Technical Report, 2010). Although “no shows” in general are problematic in data sets because users have no insight into why participants did not attend a given program, in this case they afforded us a unique opportunity to look at actual child care attendance patterns and how they varied across our subgroup samples.

#### *Type of child care arrangement*

In the spring 2003 parent interview, for both children assigned to Head Start and the control condition, the primary caregiver was asked to report on the main child care setting where the child spent a minimum of five hours between 8:00 a.m. and 6:00 p.m. Monday through Friday. A child care arrangement was coded “1” if the primary caregiver indicated that it was the child’s main care setting, and “0” otherwise. There was extensive reconciliation of this parent response with other study instruments such as teacher surveys, child care provider interviews, and teacher ratings of the child (U.S. DHHS, Final Report, 2010).

#### *Classroom quality*

Classroom quality was measured by the Early Childhood Environment Rating Scale-Revised (ECERS-R; Harms, Clifford, & Cryer, 1998). Classroom observations conducted by study staff rated the classroom from 1 to 7, with 1 indicating “inadequate” quality, 3 indicating “minimal” quality, 5 indicating “good” quality, and 7 indicating “excellent” quality, on 37 items covering six subscales: (1) adequacy of space and furnishings; (2) personal care routines; (3) language and reasoning, including materials available and activities used; (4) range of activities that are used and available; (5) interactions, including both staff–child and child–child interactions; and (6) program structure, including the use of a daily schedule. An overall average score was computed for all center-based classrooms attended by study children. There was considerable variation within both study groups; however, the vast majority of Head Start children (about 70%) attended classrooms that had ECERS-R scores of a five or higher, whereas only 40% of control group children attended classrooms with such scores (U.S. DHHS, Final Report, 2010). Reviews indicate the predicative validity of the ECERS-R for child outcomes is, at best, low (Auger, Farkas, Burchinal, Duncan, & Vandell, 2013; Gordon, Fujimoto, Kaestner, Korenman, & Abner, 2013); nonetheless, it was the best measure of classroom quality collected by the HSIS.

#### *Covariates*

In order to sharpen the standard errors of our point estimates and to adjust for departures from randomization, several child and family covariates were included in the model, minimizing the potential for omitted variable bias. We used the same list of covariates as was used in Final Report of the HSIS (U.S. DHHS, 2010), which included a broad set of key child and family demographic characteristics likely correlated with selection into Head Start centers as

well as child outcomes. Prior research specifically on DLL children’s child care use included similar covariates (Espinosa et al., 2013; Fuligni, Guerra, & Nelson, 2013; Howes et al., 2008). Child covariates included: gender; age in weeks at the spring 2003 assessment; whether the child was classified as having a disability; and number of elapsed weeks from September 1, 2002 until the spring 2003 assessment. Family covariates included: caregiver age in years; an indicator of caregiver depression; highest level of maternal education; whether the mother immigrated to the United States within the last 10 years; and three family structure variables including whether both biological parents lived with the child, whether the mother was married, and whether the mother was teenaged at the child’s birth. The child’s baseline level of achievement as measured by the English version of the PPVT was also included in the models. For the purposes of our analyses, all covariates were centered at their mean.

#### *Non-response*

As with any longitudinal dataset, there was non-response in the HSIS. In particular, spring 2003 parent interview response rates were correlated with treatment or control status as well as child gender and age. To control for this potential bias, we weighted all our analyses, including descriptives and estimation models, using the appropriate weights, which included a weight for probability of sample selection at every stage multiplied by a weight adjusted for non-response. The weights included in our analyses are listed at the bottom of every table and helped control potential non-response bias by compensating for different data collection response rates across these demographic groups of children. Weights are important in complicated multi-stage sampling studies such as the HSIS because they allow us to make inferences to the relevant general population, and they account for differential selection probabilities and differential non-response (U.S. DHHS, Technical Report, 2010).

#### *Analysis plan*

To ascertain if DLLs were more or less likely than monolingual English-speaking children in the HSIS to attend a Head Start center if given access through random assignment (research question one), we ran two sets of complementary analyses. First, we compared the take-up rates for DLLs and monolingual-English speakers using *t*-tests for the differences in means of the two subgroups. Second, we ran a series of step-wise logistic regression models predicting Head Start attendance if randomly assigned. Our first model was a simple bivariate logistic regression of Spanish-speaking DLL status predicting Head Start attendance. Because DLLs in the HSIS tended to be heavily clustered in the same centers, Model 2 included our principal predictor, Spanish-speaking DLL status, as well as Head Start center-level fixed effects to account for this substantial between-center variation, and to determine if, within the same center, Spanish-speaking DLLs were more or less likely than monolingual-English speakers to attend Head Start if given access through random assignment. Model 3 included our principal predictor, Head Start center-level fixed effects, and the full set of covariates. Our fourth and final model included Spanish-speaking DLL status, Head Start center-level fixed effects, the full set of covariates, and baseline achievement as measured by the PPVT, predicting Head Start attendance.

The coefficients in all four models are expressed as odds ratios (OR). Odds ratios represent the odds that an outcome will occur given a particular variable, compared with the odds of the outcome occurring in the absence of that variable. In the present study, we calculated odds ratios to determine the association between Head Start attendance and DLL status as compared with monolingual-English children. An odds ratio greater than 1 indicates that DLL status was associated with higher odds of Head Start attendance,

**Table 2**  
Logistic regressions predicting HS Attendance if randomly assigned by Spanish-speaking DLL status.

	Head Start center attendance if randomly assigned			
	(1) Simple bivariate	(2) Center fixed effects	(3) Center fixed effects plus covariates	(4) Center fixed effects plus covariates and prior achievement
Dual Language Learner status (dummy if Spanish at baseline)	1.66** (2.96)	3.90*** (4.11)	3.12** (2.56)	3.01* (2.36)
Intercept	4.04	1.37	5.84	5.88
N	2236	2236	2236	2203

Note. *t*-statistics in parentheses calculated using jackknife replicate weights. Odds ratios reported in table.

- \*  $p < .05$ .
- \*\*  $p < .01$ .
- \*\*\*  $p < .001$ .

HS attendance is caregiver reported and reconciled with other data sources. Prior achievement measured by baseline PPVT. Covariates (centered at their mean): baseline achievement, child cohort, child gender, child disability status, maternal education, maternal marital status, caregiver depression, teenage mother status, caregiver age, maternal immigration status, child age at spring 2003 assessment, number of weeks elapsed between 09/01/02 and spring 2003 child assessment. Weight used = CHSPR2003WTPI.

whereas an odds ratio less than 1 meant that DLL status was associated with lower odds of Head Start attendance, compared with monolingual-English speakers.

To ascertain if Spanish-speaking DLLs were more or less likely than monolingual-English speakers to attend higher-quality center-based care as measured by the ECERS-R if not given access to attend Head Start centers through random assignment (research question two), we ran three sets of analyses. First, we compared the types of child care arrangements utilized by Spanish-speaking DLLs and monolingual-English speakers using *t*-tests for the differences in means to see if there were any general differences in the care arrangements attended by these two subgroups in the control condition. Then, for control condition children who attended center-based care, including other non-study Head Start centers, we compared the quality of the classroom environment as measured by total ECERS-R scores for Spanish-speaking DLLs and monolingual-English speakers using *t*-tests for the differences in means of the two subgroups. Finally, we ran a similar series of step-wise regressions as the Head Start attendance models, this time predicting classroom quality measured by the ECERS-R if randomly assigned to the control condition. Here we included center-level fixed effects as a proxy for neighborhood, to ensure that the alternative center-based care options when not randomly assigned to Head Start were the same for DLLs and monolingual-English speakers.

**Results**

*Head Start attendance*

Results from the *t*-tests for the differences in means in take-up rates of Spanish-speaking DLLs and monolingual-English speakers show that if granted access to a Head Start center through random assignment, Spanish-speaking DLL children were significantly more likely than their monolingual-English peers to actually attend the program (84% vs. 80%,  $p < .01$ ).

Table 2 displays the series of the logistic regression models predicting Head Start attendance expressed as odds ratios (OR). In the simple bivariate regression (Model 1), Spanish-speaking DLLs were significantly more likely, on average, than their monolingual-English-speaking peers to attend a Head Start center, if given access through random assignment ( $OR = 1.66, p < .01$ ). This result held when we included Head Start center-level fixed effects in Model 2, indicating that even within the same center, Spanish-speaking DLLs were more likely, on average, than monolingual-English speakers to attend if given access ( $OR = 3.90, p < .001$ ). Similarly, when we included the full set of covariates (Model 3), DLLs were again more likely, on average, than monolingual-English speakers to attend a Head Start center if granted access through

random assignment ( $OR = 3.12, p < .01$ ). Finally, in Model 4, when we included the complete set of covariates plus the baseline level of achievement, Spanish-speaking DLLs were still more likely, on average, to attend Head Start if randomly assigned than monolingual-English speakers ( $OR = 3.01, p < .05$ ).

Thus, Table 2 indicates that DLL children were more likely to attend Head Start if randomly assigned admission, on average, compared with monolingual-English-speaking children, and these higher take-up rates were not conditional on any observable characteristics including prior achievement. Furthermore, the OR in the models including center fixed-effects were almost twice as large as the models without them. This indicates that Head Start was a particularly appealing center-based care option for DLLs in places where they were clustered in large numbers.

*Classroom quality*

Table 3 displays the results of the *t*-tests for the differences in means of types of child care arrangements used by the two subgroups in the control condition. There were no significant differences in the type of primary child care arrangement utilized between Spanish-speaking DLLs and their monolingual-English peers if they were assigned to the control condition. This suggests that despite prior research indicating that when compared to other subgroups, Hispanic DLL parents tend to utilize parental or relative care over center-based care (Buysse et al., 2013; Kagan, 2009; Laughlin, 2013), Spanish-speaking DLLs in the HSIS sample actually attended center-based care at the same rates as monolingual-English speakers. Additionally, results from the *t*-tests for the differences in means of center-based classroom quality as measured by the ECERS-R scores show that Spanish-speaking DLLs in the control condition attended higher-quality centers than their monolingual-English peers in the control condition ( $\beta = 30, p < .05$ ).

**Table 3**  
Type of child care if randomly assigned to control condition by Spanish-speaking DLL status.

	Spanish-speaking Dual Language Learner		Monolingual-English speaker	
	N	Mean/% of sample	N	Mean/% of sample
Head Start	55	0.18	140	0.15
Other center-based care	144	0.28	494	0.32
Family daycare	30	0.07	174	0.13
Parental care	202	0.43	546	0.37
Non-parental home care	16	0.03	50	0.04

Note. Weight used = CHSPR2003WTPI.

**Table 4**  
Relationship between classroom quality and Spanish-speaking DLL status in control condition.

	Classroom quality if randomly assigned to the control condition			
	(1) Simple bivariate	(2) Center fixed effects	(3) Center fixed effects plus covariates	(4) Center fixed effects plus covariates and prior achievement
Dual Language Learner status (dummy if Spanish at baseline)	0.17** (0.07)	0.21* (0.10)	0.32 (0.20)	0.37 (0.23)
N	426	426	426	412
R <sup>2</sup>	0.03	0.74	0.76	0.77

Note. Standardized coefficients. Standard errors in parentheses calculated using jackknife replicate weights.

\*  $p < .05$ .

\*\*  $p < .01$ .

Classroom quality measured by the Early Childhood Environment Rating Scale-Revised (ECERS-R). Prior achievement measured by baseline PPVT. Covariates (centered at their mean): baseline achievement, child cohort, child gender, child disability status, maternal education, maternal marital status, caregiver depression, teenage mother status, caregiver age, maternal immigration status, child age at spring 2003 assessment, number of weeks elapsed between 09/01/02 and spring 2003 child assessment. Weight used = S03TRWTC.PI.CO.

Table 4 displays the series of the regression models predicting standardized classroom quality. In the simple bivariate regression (Model 1), Spanish-speaking DLLs in the control condition, on average, attended significantly higher-quality centers than monolingual English-speaking children ( $\beta = .17, p < .01$ ). This result held when we included Head Start center-level fixed effects in Model 2, indicating that within the same neighborhoods, control-group Spanish-speaking DLLs, on average, attended higher-quality alternative center-based care than monolingual-English children in the control group ( $\beta = .21, p < .001$ ). In our last two models, where we included both Head Start center-level fixed effects and the full set of covariates (Model 3) as well as baseline level of achievement as measured by the PPVT (Model 4), there were no significant differences in the classroom quality between Spanish-speaking DLLs and monolingual-English speakers in the control condition. Despite the fact that the coefficient on DLL status lost significance in these last two models, the magnitude of the coefficients substantially increased, as did the standard errors. This suggests that restricting the analytic sample to control group children with the inclusion of center-level fixed effects and so many covariates may have rendered our analysis highly underpowered and thus unable to detect smaller effects. With a larger sample size, we may have been able to detect an effect of DLL status on classroom quality in these models, though we cannot say with certainty.

#### Further robustness checks

Economic hardship is an important factor related to both English language skills and child care participation. However, in the HSIS, the variable for income was not very reliable and had a lot of missing data; only about 54% of the sample had a valid measure of family income. Nonetheless, as a further robustness check we reran both sets of analyses including the variable for family income. Results are available upon request from the corresponding author and indicate that the primary results held even when controlling for income. In order to preserve sample size and to increase statistical power, we excluded income in the models displayed here.

#### Discussion

Despite previous research indicating that, compared with other subgroups, Spanish-speaking DLLs are more likely to participate in familial care as opposed to center-based care (Buysse et al., 2013; Kagan, 2009; Laughlin, 2013), our results suggest the opposite. We found no differences, on average, in the participation in types of care between Spanish-speaking DLL children and monolingual English-speaking learners who were not offered a spot in Head Start, and we further determined that Spanish-speaking DLL children were

more likely, on average, than their monolingual-English peers to accept the offer of Head Start if randomly assigned to a center. This finding was robust across four different model specifications, suggesting that these higher take-up rates were not conditional on any observable characteristics, including prior achievement.

We also determined that Spanish-speaking DLLs who were not offered the opportunity to attend an HSIS center, on average, participated in centers at the same rates as non-DLLs and that were of higher quality than those that monolingual-English children attended. Though this finding was not quite as robust, we may have been limited in our statistical power to detect possible smaller effects. Taken together, these results provide strong evidence that access to quality ECE programs, such as Head Start, plays a key role in the participation of Spanish-speaking DLLs.

Additionally, the results from our inclusion of Head Start center-level fixed effects indicate that Head Start was a particularly appealing center-based care option for DLLs in places where they were clustered in large numbers. This might suggest that there are social influences in families enrolling their children in centers where other families they know send their children – similar to Vesely's (2013) findings that immigrant mothers' utilization of ECE programs were influenced by the behaviors of other mothers who they knew. This also might suggest that Head Start does a particularly good job of connecting with this population, highlighting the importance of strengthening the access to Head Start centers for Spanish-speaking DLLs. In this case, according to Matthews and Jang's (2007) conceptualization of access (accessibility, awareness, and responsiveness), the availability of Head Start centers is of particular import. Future research can determine why there were higher enrollment rates where DLL families were concentrated, and whether community-level factors, rather than individual attributes of the children and families, were responsible.

The findings from this study are similar to those of Greenberg and Kahn (2012), who found that net of socioeconomic factors, Hispanic children were as likely as whites to attend ECE programs, and those of Winsler et al. (2013), who determined that Spanish-speaking DLLs in Miami were more likely to attend subsidized center-based care or pre-kindergarten than family day care. In addition, this study builds upon the findings of Espinosa et al. (2013), who used data from the ECLS-B and found no reliable differences due to home language (i.e., DLL vs. monolingual-English speaker) as to whether a child was in care, the type of care, the quality of care, or the time spent in the care. The present study contributes to the line of research on the ECE participation patterns of Spanish-speaking DLLs as we showed that these were not localized behaviors exclusive to a specific U.S. region (Winsler et al., 2013) or limited to population observational data (Espinosa et al., 2013; Greenberg & Kahn, 2012). Rather, our analyses determined that, in the context of

a nationally representative study, Spanish-speaking DLLs in diverse areas around the country enrolled in Head Start or quality center care at higher rates than their monolingual-English peers. Furthermore, these findings contribute to theory about Spanish-speaking DLLs' participation in ECE programs, as we show that access plays a key role in the institutional selection process of the DLLs in our sample.

Reinforcing this evidence are findings from the HSIS Final Report (U.S. DHHS, 2010). In analyzing associations between racial characteristics and the likelihood that children returned for a second year of Head Start, the authors found suggestive evidence that children from Hispanic families were more likely than children from Black or White families to return for a second year of Head Start ( $p < .10$ ). Similarly, children from homes in which Spanish was the household language, were significantly more likely to return for a second year of Head Start ( $p < .05$ ; U.S. DHHS, Final Report, 2010). Though non-experimental because in the second year centers had to admit control group members that initially lost the lottery, this evidence has important implications. Taken in conjunction with the findings from the present study, these results suggest that Spanish-speaking DLLs are not only more likely to accept the initial offer of Head Start, but are also more likely to remain in Head Start for a second year compared with other subgroups.

These findings of Spanish-speaking DLLs' participation in Head Start are important in light of the research highlighting the role that ECE programs can play in equipping Spanish-speaking DLL children with the skills necessary for school readiness and future academic success (Buyse et al., 2013; Espinosa, 2013; U.S. DHHS, Final Report, 2010). The HSIS Final Report (U.S. DHHS, 2010) provides evidence that participating in Head Start appears to differentially benefit such students. Research described in the report determined that even though Spanish-speaking DLLs performed at lower levels than their English-speaking peers, those who were assigned to Head Start demonstrated greater English oral language gains than non-DLL children (U.S. DHHS, 2010). These findings indicate the potential of ECE programs for equipping these young learners with key English language skills that may aid their future English literacy and academic success. It is therefore critical to provide Spanish-speaking DLL families with sufficient access to quality ECE programs.

#### *Limitations and future directions*

Some important study limitations should be noted. First, although the internal validity of our study is stronger than in many observational studies because we were able to exploit the random assignment feature of the HSIS to control for DLLs' systematic disadvantage in access to quality ECE, the results of our study can only be generalized to the subsample of Spanish-speaking DLL children who were self-enrolling into the random assignment pool of students, which may be a narrower band of the total eligible DLL population. Nonetheless, there is encouraging evidence from other recent nationally representative observational work that this is not the case (i.e., that Spanish-speaking DLLs purposely do not select into center-based care settings if given the opportunity), as both Greenberg and Kahn (2012) and Espinosa et al. (2013) found that conditioning on observable demographic characteristics, Latinos were as likely as other subgroups to participate in center-based programs. Therefore, we are encouraged that the self-enrolling population may not in fact be a narrower band of the total eligible DLL population. We look forward to future work confirming this hypothesis.

Additionally, our classification of monolingual-English speakers is also a potential limitation. It is important to recognize that how children are identified and classified has important implications for the results of studies, and our research is no

exception. As mentioned previously, the monolingual-English speaking group that we used for our analyses stems from the HSIS's classification of English proficiency, that is, children who were tested in English at baseline based on caregiver report of the child's language abilities and preferences, regardless of their home language. Ours is a more nuanced determination of a child's language abilities than simply using the reported home language. Subsequently, we included children in the monolingual-English group who came from homes where English was not the primary language yet were deemed as English-proficient. Clearly, children who were able to meet the cognitive demands of an assessment battery in English, but did not receive English language support at home on par with monolingual-English children, have their own unique challenges. However, we opted to use this more nuanced determination because we really wanted to focus on the needs of children who did not even meet the first requirement. We feel that this finer level of classification only strengthens our findings.

Furthermore, although we considered differences in classroom quality as measured by the ECERS-R, more research is needed to understand what constitutes as "quality" ECE programs for Spanish-speaking DLLs, particularly because the predictive validity of the ECERS-R for child outcomes is, at best, low (Auger et al., 2013; Gordon et al., 2013). This is especially important in light of the adoption by 44 U.S. states and the District of Columbia of the Common Core State Standards, and the impact that this will have on DLL students and the ECE preparation that they receive. Now, more than ever, it is critical to understand how to address the potentially diverse needs of young Spanish-speaking DLLs to prepare them for such standards. Future research investigating effective ECE programs for Spanish-speaking DLL children should explore types of curriculum, longitudinal effects of participating in ECE, teaching strategies for language development, and bilingual programs (Hammer, Scarpino, & Davison, 2011).

Finally, we were limited by our objective to examine differences in ECE participation patterns between Spanish-speaking DLLs and monolingual-English speakers at the national level. By focusing on the larger, national Head Start population of Spanish-speaking DLLs, we limited the extent to which we could examine variation within this subgroup. Some studies have suggested the importance of immigration status and generation on Spanish-speaking DLL children's participation in ECE programs (Rodríguez et al., 2013; Vesely, 2013; Winsler et al., 2013), and although we controlled for immigrant status, we were unable to specifically test if it predicted any differences in Head Start participation or center quality attendance. Additionally, because the data were not available, we could not analyze differences by country of origin, which has also been found to be a factor in Hispanic children's participation in early education and child care (Rodríguez et al., 2013; Vesely, 2013). Future research should examine these important sources of variation.

In sum, policymakers can glean two important implications from this study: (1) if Spanish-speaking DLLs are given access to Head Start, they will likely attend; and (2) even if they are not offered a spot in Head Start, Spanish-speaking DLLs will likely participate in quality center-based care compared with other subgroups. Additionally, Head Start appears to differentially benefit the English language skills of Spanish-speaking DLLs (U.S. DHHS, Final Report, 2010). An important issue, therefore, becomes one of access to quality ECE programs for Spanish-speaking DLL families, and policymakers must work to ensure that quality ECE programs are available to this growing population. Furthermore, as nuanced research on access suggests (Matthews & Jang, 2007; Vesely, 2013), policymakers, educators, and community members must reach out to Spanish-speaking DLL parents as critical partners in early

learning, providing them not only with quality ECE options, but also informing them about their options, and ensuring that the ECE programs serve the cultural and linguistic needs of the community.

## References

- Auger, A., Farkas, G., Burchinal, M., Duncan, G. J., & Vandell, D.L. (2013). Child care quality effects on academic achievement: An instrumental variables analysis (submitted for publication).
- August, D. L., & Hakuta, K. (1997). *Improving schooling for language-minority children*. Washington, DC: National Academy Press.
- August, D., & Shanahan, T. (Eds.). (2006). *Developing literacy in second-language learners: Report of the National Literacy Panel on language-minority children and youth*. Mahwah, NJ: Erlbaum.
- Barnett, W. S. (2011). Effectiveness of educational intervention. *Science*, 333(6045), 975–978. <http://dx.doi.org/10.1126/science.1204534>
- Barnett, W. S., Carolan, M. E., Fitzgerald, J., & Squires, J. H. (2012). *The state of preschool 2012: State preschool yearbook, executive summary*. New Brunswick, NJ: Rutgers, The State University of New Jersey, National Institute for Early Education Research. Retrieved from <http://nieer.org/publications/state-preschool-2012>
- Beltrán, E. (2011). *Preschool education: Delivering on the promise for Latino children*. (National Council of La Raza report). Retrieved from [http://www.nclr.org/index.php/publications/preschool\\_education/](http://www.nclr.org/index.php/publications/preschool_education/)
- Buysse, V., Peisner-Feinberg, E., Pérez, M., Hammer, C. S., & Knowles, M. (2013). Effects of early education programs and practices on the development and learning of dual language learners: A review of the literature. *Early Childhood Research Quarterly*, <http://dx.doi.org/10.1016/j.ecresq.2013.08.004>
- Calderón, M., Slavin, R., & Sánchez, M. (2011). Effective instruction for English learners. *Future of Children*, 21(1), 103–127. <http://dx.doi.org/10.1353/foc.2011.0007>
- Deming, D. (2009). Early childhood intervention and life-cycle skill development: Evidence from Head Start. *American Economic Journal: Applied Economics*, 1(3), 111–134. <http://dx.doi.org/10.1257/app.1.3.111>
- Duncan, G. J., & Magnuson, K. (2013). Investing in preschool programs. *Journal of Economic Perspectives*, 27(2), 109–132. <http://dx.doi.org/10.1257/jep.27.2.109>
- Dunn, L. M., & Dunn, L. M. (1997). *Peabody Picture Vocabulary Test, Third Edition (PPVT)*. Circle Pines, MN: American Guidance Services.
- Dunn, L. M., Lugo, D. E., Padilla, E. R., & Dunn, L. M. (1986). *TVIP – Test Vocabulario en Imágenes Peabody*. Circle Pines, MN: American Guidance Service.
- Espinosa, L. M. (2013). *Early education for dual language learners: Promoting school readiness and early school success*. Washington, DC: Migration Policy Institute.
- Espinosa, L. M., LaForett, D. R., Burchinal, M. R., Winsler, A., Tien, H., Peisner-Feinberg, E., & Castro, D. C. (2013, April). Child care experiences among dual language learners in the U.S.: Analyses of the Early Childhood Longitudinal Survey-Birth Cohort. In A. Fuligni (Chair), *The complex picture of child care use for dual-language learners: Diversity of families and children's experiences over time*. Paper presented at the biennial conference of the Society for Research on Child Development, Seattle, WA.
- Fry, R., & Lopez, M. H. (2012). *Hispanic student enrollments reach new highs in 2011*. Washington, DC: Pew Hispanic Center, Pew Research Center. Retrieved from <http://www.pewhispanic.org/files/2012/08/Hispanic-Student-Enrollments-Reach-New-Highs-in-2011.FINAL.pdf>
- Fuligni, A. S., Guerra, A. W., & Nelson, D. (2013, April). Early child care use among low-income Latino families: Amount, type, and stability vary according to bilingual status. In A. Fuligni (Chair), *The complex picture of child care use and dual-language learners: Diversity of families and children's experiences over time*. Paper presented at the Biennial Meeting of the Society for Research in Child Development, Seattle, WA.
- Fuller, B., Holloway, S. D., & Liang, X. (1996). Family selection of child-care centers: The influence of household support, ethnicity, and parental practices. *Child Development*, 67(6), 3320–3337. <http://dx.doi.org/10.1111/j.1467-8624.1996.tb01916.x>
- Fuller, B., Kagan, S. L., Loeb, S., & Chang, Y. W. (2004). Child care quality. Centers and home settings that serve poor families. *Early Childhood Research Quarterly*, 19(4), 505–527. <http://dx.doi.org/10.1016/j.ecresq.2004.10.006>
- Fuller, B., & Kim, A. Y. (2011). *Latino access to preschool stalls after earlier gains: Certain to harden achievement gaps, erode workforce quality*. Berkeley, CA: Institute of Human Development at the University of California. Retrieved from [http://ihd.berkeley.edu/Latino preschool decline-NOLA-NJLC-Brief-2011-FINAL.pdf](http://ihd.berkeley.edu/Latino%20preschool%20decline-NOLA-NJLC-Brief-2011-FINAL.pdf)
- García, E. E. (2012). Language, culture, and early education in the United States. In R. C. Pianta, W. S. Barnett, L. M. Justice, & S. M. Sheridan (Eds.), *Handbook of early childhood education* (pp. 137–157). New York, NY: The Guilford Press.
- Gordon, R. A., Fujimoto, K., Kaestner, R., Korenman, S., & Abner, K. (2013). An assessment of the validity of the *ECERS-R* with implications for measures of child care quality and relations to child development. *Developmental Psychology*, 49(1), 146–160. <http://dx.doi.org/10.1037/a0027899>
- Gormley, W. T. (2008). The effects of Oklahoma's pre-k program on Hispanic children. *Social Science Quarterly*, 89(4), 916–936. <http://dx.doi.org/10.1111/j.1540-6237.2008.00591.x>
- Greenberg, J. P., & Kahn, J. M. (2012). Early childhood education and care use: Differences by race/ethnicity and age. *Journal of Children and Poverty*, 18(1), 23–54. <http://dx.doi.org/10.1080/10796126.2012.657017>
- Hammer, C. S., Lawrence, F. R., & Miccio, A. W. (2007). Bilingual children's language abilities and early reading outcomes in Head Start and kindergarten. *Language, Speech, and Hearing Services in Schools*, 38(3), 237–248. [http://dx.doi.org/10.1044/0161-1461\(2007\)025](http://dx.doi.org/10.1044/0161-1461(2007)025)
- Hammer, C. S., Scarpino, S., & Davison, M. D. (2011). Beginning with language. Spanish-English bilingual preschoolers' early literacy development. In S. B. Neuman, & D. K. Dickinson (Eds.), *Handbook of early literacy research* (Vol. 3) (pp. 118–135). New York, NY: The Guilford Press.
- Harms, T., Clifford, R. M., & Cryer, D. (1998). *Early Childhood Environment Rating Scale: Revised edition*. New York, NY: Teachers College Press.
- Hart, B., & Risley, T. (1995). *Meaningful differences in the everyday experience of young American children*. Baltimore, MD: Paul H. Brookes.
- Hernandez, D. J., Denton, N. A., & Macartney, S. E. (2011). Early childhood education programs: Accounting for low enrollment in immigrant and monolingual families. In R. Alba, & M. C. Waters (Eds.), *The next generation: Immigrant youth in comparative perspective* (pp. 46–68). New York, NY: NYU Press.
- Hoff, E. (2013). Interpreting the early language trajectories of children from low-SES and language minority homes: Implications for closing achievement gaps. *Developmental Psychology*, 49(1), 4–14. <http://dx.doi.org/10.1037/a0027238>
- Howes, C., Burchinal, M., Pianta, R., Bryant, D., Early, D., Clifford, R., & Barbarin, O. (2008). Ready to learn? Children's pre-academic achievement in pre-kindergarten programs. *Early Childhood Research Quarterly*, 23(1), 27–50. <http://dx.doi.org/10.1016/j.ecresq.2007.05.002>
- Kagan, S. L. (2009). *American early childhood education: Preventing or perpetuating inequity?* (Equity Matters, Research Review No. 3). New York, NY: Teachers College. Retrieved from [http://www.equitycampaign.org/ia/document/9833\\_EquityMatters.Kagan.Final.pdf](http://www.equitycampaign.org/ia/document/9833_EquityMatters.Kagan.Final.pdf)
- Karoly, L. A., Kilburn, M. R., & Cannon, J. S. (2005). *Early childhood interventions: Proven results, future promise*. Santa Monica, CA: Rand Corporation.
- Kieffer, M. J. (2010). Socioeconomic status, English proficiency, and late-emerging reading difficulties. *Educational Researcher*, 39(6), 484–486. <http://dx.doi.org/10.3102/0013X10378400>
- Laughlin, L. (2013). *Who's minding the kids? Child care arrangements: Spring 2011* (Current Population Reports, P 70-135). Washington, DC: U.S. Census Bureau. Retrieved from <http://www.census.gov/prod/2013pubs/p70-135.pdf>
- Lee, V., & Burkam, D. (2002). *Inequality at the starting gate: Social background differences in achievement as children begin school*. Washington, DC: Economic Policy Institute.
- 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(1), 52–66. <http://dx.doi.org/10.1016/j.econedurev.2005.11.005>
- Lonigan, C. J., Wagner, R. K., Torgesen, J. K., & Rashotte, C. (2002). *Preschool Comprehensive Test of Phonological and Print Processing*. Austin, TX: ProEd.
- Lopez, M. H., & Velasco, G. (2011). *Childhood poverty among Hispanics sets record, leads nation*. Washington, DC: Pew Hispanic Center, Pew Research Center. Retrieved from <http://www.pewhispanic.org/2011/09/28/childhood-poverty-among-hispanics-sets-record-leads-nation>
- Magnuson, K. A., Ruhm, C., & Waldfogel, J. (2007). Does prekindergarten improve school preparation and performance? *Economics of Education Review*, 26(1), 33–51. <http://dx.doi.org/10.1016/j.econedurev.2005.09.008>
- Magnuson, K. A., & Waldfogel, J. (2005). Preschool child care and parents' use of physical discipline. *Infant and Child Development*, 14(2), 177–198. <http://dx.doi.org/10.1002/icd.387>
- Mancilla-Martinez, J., & Lesaux, N. K. (2011). The gap between Spanish speakers' word reading and word knowledge: A longitudinal study. *Child Development*, 82(5), 1544–1560. <http://dx.doi.org/10.1111/j.1467-8624.2011.01633.x>
- Mancilla-Martinez, J., & Vagh, S. B. (2013). Growth in toddlers' Spanish, English, and conceptual vocabulary knowledge. *Early Childhood Research Quarterly*, 28(3), 555–567. <http://dx.doi.org/10.1016/j.ecresq.2013.03.004>
- Mason, J. M., & Stewart, J. (1989). *The CAP Early Childhood Diagnostic Instrument (prepublication edition)*. Iowa City, IA: American Testronics.
- Matthews, H., & Jang, D. (2007). *The challenges of change: Learning from the child care and early educational experiences of immigrant families*. Washington, DC: Center for Law and Social Policy. Retrieved from <http://fcd-us.org/resources/challenges-change-learning-child-care-and-early-education-experiences-immigrant-families?destination=resources%2Fsearch%3Fpage=14>
- McCarthy, D. (1970, 1972). *McCarthy Scales of Children's Abilities*. San Antonio, TX: The Psychological Corporation.
- Murnane, R. J., & Willett, J. B. (2011). *Methods matter: Improving causal inference in educational and social science research*. New York, NY: Oxford University Press.
- National Assessment of Educational Progress. (2011). *The nation's report card*. Retrieved from [http://www.nationsreportcard.gov/reading\\_2011/](http://www.nationsreportcard.gov/reading_2011/)
- National Clearinghouse for English Language Acquisition. (2011). *The growing numbers of English Learner Students, 1998/99-2008/09*. Retrieved from [http://www.ncela.gwu.edu/files/uploads/9/growing\\_EL\\_0910.pdf](http://www.ncela.gwu.edu/files/uploads/9/growing_EL_0910.pdf)
- National Task Force on Early Childhood Education for Hispanics. (2007). *Para nuestros niños: Expanding and improving early education for Hispanics [Main report]*. Tempe, AZ: Arizona State University.
- Ramey, C. T., & Ramey, S. L. (2006). Early learning and school readiness: Can early intervention make a difference? In N. F. Watt, C. Ayoub, R. H. Bradley, J. E. Puma, & A. LeBoeuf (Eds.), *The crisis in youth mental health* (pp. 291–318). Westport, CT: Praeger.

- Rodríguez, B., Hammer, C. S., López, L. M., Komaroff, E., Scarpino, S. E., & Goldstein, B. A. (2013, April). *Cuidando los niños: Characteristics of Latino children's early education and childcare*. Paper presented at the Biennial Meeting of the Society for Research in Child Development, Seattle, WA.
- Schweinhart, L. J. (2006). *The high/scope approach: Evidence that participatory learning in early childhood contributes to human development*. In N. F. Watt, C. Ayoub, R. H. Bradley, J. E. Puma, & W. A. LeBoeuf (Eds.), *The crisis in youth mental health* (pp. 207–227). Westport, CT: Praeger.
- Spira, E. G., Bracken, S. S., & Fischel, J. E. (2005). Predicting improvement after first-grade reading difficulties: The effects of oral language, emergent literacy, and behavior skills. *Developmental Psychology*, 41(1), 225–234. <http://dx.doi.org/10.1037/0012-1649.41.1.225>
- U.S. Department of Health and Human Services. Administration for Children and Families. Office of Planning, Research and Evaluation. Head Start Impact Study. (2002–2006). *ICPSR 29462-v4*. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2012-06-15. <http://dx.doi.org/10.3886/ICPSR 29462.v4>
- U.S. Department of Health and Human Services, Administration for Children and Families. (2010a). *Head Start Impact Study. Final report*. Washington, DC: Author.
- U.S. Department of Health and Human Services, Administration for Children and Families. (2010b). *Head Start Impact Study. Technical report*. Washington, DC: Author.
- U.S. Department of Health and Human Services, Administration for Children and Families, Head Start Bureau. (2012). *Head Start program fact sheet, Fiscal Year 2012*. Retrieved from <http://eclkc.ohs.acf.hhs.gov/hslc/mr/factsheets/2012-hs-program-factsheet.html>
- U.S. Department of Health and Human Services, Administration for Children and Families. (2012). *Child outcomes and classroom quality in FACES 2009 (OPRE Report 2012-37a)*. Washington, DC: Author.
- Vesely, C. K. (2013). Low-income African and Latina immigrant mothers' selection of early childhood care and education (ECCE): Considering the complexity of cultural and structural influences. *Early Childhood Research Quarterly*, 28(3), 470–486. <http://dx.doi.org/10.1016/j.ecresq.2013.02.001>
- Winsler, A., Robinson, J., & Thibodeaux, J. (2013, April). Patterns of subsidized child care and public school pre-k use in Miami as a function of ethnicity, language, immigration, and generation. In A. Fuligni (Chair), *The complex picture of child care use and dual-language learners: Diversity of families and children's experiences over time*. Paper presented at the Biennial Meeting of the Society for Research in Child Development, Seattle, WA.
- Woodcock, R. W., & Muñoz-Sandoval, A. F. (1996). *Batería Woodcock-Muñoz Pruebas de Aprovechamiento-Revisada*. Itasca, IL: Riverside Publishing.
- Woodcock, R. W., McGrew, K. S., & Mather, N. (2001). *Woodcock-Johnson III Tests of Achievement*. Itasca, IL: Riverside Publishing.