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School readiness among low-income, Latino children attending family childcare versus centre-based care

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Latino children often struggle in school. Early childhood education programmes are seen as critical for fostering children's school readiness. Latino families often choose family childcare (FCC) over centre-based childcare (CBC), yet little is known about the school readiness of Latino children attending FCC. We compared school readiness over the pre-kindergarten year for low-income Latino children who attended either FCC or CBC with childcare subsidies. Teachers and parents rated children's social skills and behaviour with the Devereux Early Childhood Assessment. Cognitive, motor, and language development were assessed with the Learning Accomplishment Profile Diagnostic. Although there were no family demographic differences between children who attended FCC versus CBC, children in CBC improved over time in cognitive, language, and social skills, whereas children in FCC stayed the same or lost ground in these areas over time, especially boys. The school readiness of Latino children, especially boys, may be better served by attending CBC.

Keywords: childcare; subsidies; family childcare; school readiness; Latino; poverty

Latino immigrant families are growing more rapidly than any other group (US Census Bureau, 2001, 2010). Latinos represent more than half of the growth in the US population between 2000 and 2010, and the Latino population of children less than five years of age is growing even faster (US Census Bureau, 2001, 2010). In 1995, 15% of the children born were from Hispanic mothers, compared with 22% in 2003, and subsequently there is a high demand for childcare and pre-kindergarten programmes (Garcia & Jensen, 2009; Hart, 2005). Furthermore, 37% of Latino children live in poverty compared with 10% of white children, and Latinos are considered the largest population living in poverty (Barrueco, Lopez, & Miles, 2007; Duncan & Magnuson, 2002).

Young Latino children face certain risk factors for being behind in school readiness at kindergarten entry (defined as exhibiting healthy skills in the areas of language, literacy, mathematics, science, creative arts, social, emotional, and physical health) (Head Start Bureau, 2003; US Census Bureau, 2001). Some of these risk factors include increased poverty, low parental education, limited English proficiency, and single

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parent families. Half (49%) of the Latino children have parents without a high school diploma in comparison with 7.5% for non-Hispanic white children. About a third (36%) of Latino children have parents with limited English proficiency, and 45% of Latino children have single mothers compared with 24% for white children (Barrueco et al., 2007; US Census Bureau 2001). Such risk factors contribute to Latino children entering kindergarten at a disadvantage and performing lower in certain areas of development (language and cognitive skills) compared with white children and children of higher-income households (Chernoff, Flanagan, McPhee, & Park, 2007; Fuller & García Coll, 2010; Galindo & Fuller, 2010). Further, children who are born to teenage parents or parents born outside of the USA are less likely to be enrolled in pre-kindergarten programmes, and are at risk for social and academic development upon school entry (Hair, Halle, Terry-Humen, Lavelle, & Calkins, 2006; Magnuson, Lahie, & Waldfogel, 2006). Despite these risk-factors, children from Latino families (especially immigrant families), tend to excel in socio-emotional skills and behaviour, domains that can serve as a leverage point for fostering growth in other areas of school readiness (De Feyter, & Winsler, 2009).

Children's first experiences are a foundation for their future development, and they are predictors of success in school and beyond (National School Readiness Indicators Initiative, 2005). More importantly, once children fall behind in school readiness, it is difficult to catch up with their peers (Brooks-Gunn & Duncan, 1997). Although a variety of family and environmental factors can affect children's school readiness, there is much current interest among policy-makers, practitioners, and researchers in the potential for early childhood education programmes (pre-school, childcare, public pre-kindergarten programmes, Head Start, etc) to make a difference in the school readiness of young, low-income, Latino children (Fuller, Holloway, & Liang, 1996; Garcia & Jensen, 2009; Gormley & Phillips, 2005). For these reasons, understanding the school readiness profiles of low-income Latino children attending a variety of different early care and education programmes is of utmost importance since children's skills upon entering into kindergarten are linked with their later success (Snow, 2006).

Two prominent types of early care and education programmes include family childcare (FCC) and centre-based childcare (CBC). Although definitions and licensing requirements for FCC vary considerably from state to state (Clarke-Stewart & Allhusen, 2005; Morrissey, 2007; National Association for Regulatory Administration, 2009; National Association of Child Care Resource & Referral Agencies [NACCRA], 2011), FCC typically involves a (typically female) non-relative caring for several children in her own home. On the other hand, CBC involves a separate centre/building typically organised into classrooms where larger numbers of children attend, and can include for-profit and not-for-profit centres, church-affiliated pre-school programmes, Head Start programmes, and public pre-k programmes. Childcare research has often found CBC to be superior to FCC in terms of promoting school readiness in the areas of cognitive, language, and literacy development, and perhaps teacher-child relations (Clarke-Stewart & Allhusen, 2005; Loeb, Fuller, Kagen, & Carrol, 2004). However, less research has been conducted with specifically low-income Latino populations. Fuller et al. (1996) find that low-income, working families are less likely than more advantaged families to have their children attend CBC. Further, many scholars have shown that low-income, minority families have access to, and receive, poorer quality childcare in general (regardless of childcare type) compared with families with greater economic resources (Barton & Educational Testing

Service, 2003; Clarke-Stewart & Allhusen, 2005; Crosby, Gennetian, & Huston, 2005; Pungello & Kurtz-Costes, 1999; Votruba-Drzal, Coley, & Chase-Lansdale, 2004).

Other studies have found that children who attend some form of care (either CBC or FCC) make school readiness gains and are more ready for school than children who did not attend any form of care (Weitzman, 2006; Winsler et al., 2008). To close the gap in school readiness, Weitzman suggests that it would be helpful to both make pre-school mandatory, especially for children in poverty, and to simultaneously increase the quality of childcare in general for all children. Through these two factors alone, this author estimates that the gap in school readiness for Hispanic children in comparison to white children would close by about 36%. Similarly, Brooks-Gunn and Markman (2005) estimate that access to high quality pre-school and other CBC programmes account for 26% of the White-Latino achievement gap before kindergarten.

Emerging research indicates that Latino children exhibit significant gains academically by attending pre-k programmes, especially in the areas of cognitive and language development, compared with children of other ethnic groups (Bridges, Fuller, Rumberger, & Tran, 2004; Gormley & Phillips, 2005; Loeb, Bridges, Bassok, Fuller, & Rumberger, 2007). For Latino children, test scores for cognitive, language, and motor skills showed significant improvements (73%) compared with gains made by African-American (17%) and white children, who showed no statistically significant gains. Furthermore, Latino children from Spanish-speaking homes experienced the greatest improvements in pre-reading, pre-writing, and pre-math skills when attending pre-school programmes (Gormley & Phillips, 2005). Gender differences in school readiness have also been observed with boys often starting school being behind compared with girls (Bornstein, Hahn, & Haynes, 2004; Clarke-Stewart & Allhusen, 2005; Entwisle, Alexander, & Olson, 2007; Winsler et al., 2008). Further, Entwisle et al. (2007) showed that boys are even more behind if they are from low-income families, and that they are more likely to be retained in kindergarten compared with girls.

The limited existing research on Latino children indicates that early childhood education programmes have been shown to help Latino children's school readiness, but that Latino families do not use CBC as much as children of other backgrounds (Gormley & Phillips, 2005; Hernandez, Denton, & McCartney, 2008). One reason Latino families may not use early childhood education programmes as much is that they are more likely to have unemployed parents, since four out of five children of unemployed mothers are not in regular childcare arrangements (US Census Bureau, 2010). Other emerging research shows that some Latino families, especially those of Mexican descent, appear to prefer FCC rather than CBC and other pre-school programmes, and this difference may be partly due to cultural beliefs and values, and partly due to access/barriers (Loeb et al., 2007; National Institute for Early Education Research [NIEER], 2007). The National Household Education Survey (NHES, 2005) compared perceptions of Hispanic and non-Hispanic parents on factors important for selecting childcare. The study found that 74% of Hispanic families thought location of childcare was important compared with 55% of white families, and 48% of Hispanic families thought cost was important compared with 32% of white families (NHES, 2005). Furthermore, this study found that a little over 30% of three-year-old Hispanic children were enrolled in CBC compared with 45% of non-Hispanic children, and at age four, less than 60% of Hispanic children were in CBC compared with over 70% of non-Hispanic children (NHES, 2005).

Latino families are said to value the family context and heritage cultural practices, and they may perceive FCC to be more consistent with the home environment (Fuller &

Garcia Coll, 2010). Latino children are often enrolled in FCC when FCC providers from familiar, Spanish-speaking backgrounds are available (Fuller et al., 1996; Loeb et al., 2007; Zambrana & Morant, 2009). Although cultural preference could be one explanation for the increased use of FCC compared with CBC for certain Latino communities, others point out that access barriers, such as increased cost and limited availability of CBC are also present (Calderón, 2007; NACCRA, 2008; NIEER, 2007; Tienda & Haskins, 2011; Yesil-Dagli, 2011).

The current study

Most of the existing research on types of childcare has involved rather homogenous, typically Caucasian, fairly advantaged, and often national samples (i.e. NICHD ECCRN), and has focused on CBC. In general, much less is known about children in FCC settings and very little work has focused specifically on the school readiness of low-income Latino children attending various forms of childcare (Clarke-Stewart & Allhusen, 2005; Garcia & Jensen, 2009; Loeb et al., 2004; Murray, Fees, Crowe, Murphy, & Henriksen, 2006). Many have called for childcare research to be conducted within specific minority and cultural communities (Capizzano, Adams, & Ost, 2006; Garcia & Jensen, 2009; Garcia Coll et al., 1996; Johnson et al., 2003). Indeed, Latino families themselves are very heterogeneous and it is important to take these differences of both parental origin and the different communities through which the families come from under consideration to better understand such diverse and culturally rich Latino populations. For example, Mexican-heritage children and families in the American Southwest are likely to be quite different from the Puerto Rican community of New York City, and the largely Cuban and Central-American Latino community in Miami. The present study examines the school readiness of low-income, four-year-old Latino children receiving subsidies to attend FCC and CBC in Miami, Florida.

The Miami School Readiness Project (MSRP) is a large-scale, university–community collaborative, multi-agency, applied school readiness project that took place in Miami-Dade County, Florida. Among the goals of the MSRP was assessing school readiness among children of ethnically diverse, low-income families attending a variety of different types of early childhood programmes, including FCC, CBC, and public school pre-k programmes. Winsler et al. (2008) compared the school readiness of children who received subsidies to attend CBC, children who paid to attend public school pre-k programmes, and children who attended Title 1 public school programmes. Children were assessed at the beginning and end of the pre-kindergarten year for social, behavioural, cognitive, fine motor, and language skills. Results showed that children generally made good gains in school readiness, regardless of type of care. However, children who attended CBC were at a higher risk than the other groups of being behind national norms in language development, cognition, and fine motor skills. Also, children who attended public school pre-kindergarten programmes made greater gains, in language and cognition over time than children who attended CBC. Importantly, this investigation only examined one year/cohort of the larger MSRP sample, and it did not include children who were in FCC settings.

The current study also examines data from the MSRP, however, in this case, all five years/cohorts (2002–2007) of children were included, and the sample was restricted to only Latino children whose family received subsidies for the child to attend either FCC or CBC in the community. As discussed above, it is critical to examine how low-income Latino children attending FCC and CBC are doing in terms of school readiness,

given policy interest in identifying and providing effective early care and education programmes for at-risk children. The MSRP provides a rare and large sample of demographically similar Latino children who have all passed through the barrier of enrolling their child in the subsidised childcare system and are sending their child to either CBC or FCC. This feature helps control for selection effects that have hampered prior research in this area. It is important to note that the present study does not provide information about childcare choice or utilisation among Latino families. Instead, the focus is on potential differences in the school readiness of children who attended CBC and FCC among families who have already selected the type of care for their children. Also notable about this community sample is that in Miami-Dade County, unlike many other communities, there is no shortage of Spanish-speaking early childhood caregivers and there is much sociolinguistic support for the Spanish language. So this study examines the school readiness of Latino children attending FCC and CBC when the barriers of subsidy receipt and availability of Spanish-speaking childcare providers are removed.

The following research questions were addressed: (1) Preliminarily, are there any demographic differences (maternal age, maternal education, family income, immigration status, and marital status) between the low-income Latino children attending FCC versus CBC? (2) Are there differences in child school readiness over the course of the four-year-old year in the domains of cognitive, language, fine motor, social, and behavioural skills for Latino children attending FCC versus CBC? (3) Does child gender moderate centre-type differences in school readiness? Gender is important to consider when examining childcare and school readiness, given that gender differences have been observed in school readiness among low-income children (Winsler et al., 2008), in language skill (Bornstein et al., 2004), in relationships with pre-school teachers and child behavioural problems (Ewing & Taylor, 2009), and in the effects of childcare (Clarke-Stewart & Allhusen, 2005; NHES, 2005; NICHD ECCRN, 1998). We expected that children who attended CBC would show better cognitive and language growth, while children who attended FCC might show better development in social-emotional skills and behaviour (Loeb et al., 2004). With respect to potential gender differences, we did not expect gender to interact with care type for the domains of cognitive, language, or motor skills, given earlier findings with a more diverse sample showing that boys and girls made similar gains over time (Winsler et al., 2008). However, we hypothesised that boys would exhibit more behavioural problems and poorer social skills specifically in CBC, compared with girls, and that a gender difference would not be found in FCC settings because of the larger child–teacher ratios present within the CBC setting and findings that lower quality care may have stronger effects on boys (NHES, 2005).

Method

Participants

The sample for this study consisted of 6929 low-income Latino children (52% male) from the MSRP, who had child assessment data at two time points, and who received childcare subsidies to attend either CBC or FCC in the community as a four-year-old between the years of 2002–2007. The vast majority of the sample ($n = 6792$) attended CBC, with a much smaller number ($n = 137$) attending FCC. This unequal proportion of children in CBC (98%) versus FCC (2%) is the same as that seen in the larger MSRP

sample when all ethnic groups are included, and is similar to the proportion of subsidy-receiving families in the county system who attend CBC (97%) as opposed to FCC (3%). This is consistent with prior research that shows that families are much more likely to spend childcare subsidies on CBC compared with FCC (Ryan, Johnson, Rigby, & Brooks-Gunn, 2011; Shlay, Weinraub, Harmon, & Tran, 2004; US Department of Health and Human Services, Administration for Children and Families, Child Care Bureau, 2010).

Latino/Hispanic ethnic identification of the child was determined by parent report upon registration to receive childcare subsidies with the county's childcare resource and referral agency. Also according to the parent report, the majority (66%) of the sample came from Spanish-speaking homes. Further, the vast majority (89%) of the children were born in the USA. About 50% had parents born outside the USA, and the most frequent countries of origin (roughly in order) included Cuba (44%), Haiti, Nicaragua, Colombia, Dominican Republic, Puerto Rico, Honduras, Mexico, and other South and Central American/Caribbean countries (De Feyter & Winsler, 2009). Parental informed consent to participate in the countywide evaluation and child assessments was obtained through the participating county childcare agency and was 92%. Additional demographic information about the families was available for one cohort of children only, and is reported in Table 1. Individual sample sizes vary in the analyses below since some children may have had one of the child assessments, but not the other.

Centres included licensed and license-exempt for-profit and non-profit childcare centres, including both local/individual and national chains, faith-based church pre-schools, nurseries, and daycares, accredited or not. Head Start programmes and public school pre-k programmes were not included in this study. FCC in this study included licensed and non-licensed informal home-based care providers, accredited or not. Centre quality was not systematically assessed for all children; however, it was for a large and representative subset of the current sample ($n = 1285$ children attending 271 different providers) as part of the larger MSRP. Quality ratings according

Table 1. Demographic variables.

Variables	Centre-based care $n = 2810-3368^a$	Family childcare $n = 47-55$
Maternal age M (SD)	31.59 (6.73)	31.72 (6.5)
Maternal education M (SD)	11.56 (1.78)	11.7 (2.0)
Family income M (SD)	17,225.7 (7064.24)	17,090.3 (6124.95)
Marital status		
Single	1364 (48.5%)	23 (48.9%)
Married	305 (10.9%)	4 (8.5%)
Divorced	193 (6.9%)	6 (12.8%)
Other	948 (33.7%)	14 (29.8%)
Parent birth country		
USA	1571 (55.9%)	26 (55.3%)
Other	1239 (44.1%)	21 (44.7%)

^aData on these family background variables were only available for one year/cohort of children and varied depending on the measure. Maternal age $t(3421) = 0.15, p = 0.75$; maternal education $t(2858) = 0.52, p = 0.43$; family income $t(2839) = 0.13, p = 0.89$; marital status $\chi^2(3, n = 2857) = 2.78, p = 0.43$; parent birth country $\chi^2(1, n = 2857) = 0.006, p = 0.94$.

to the Early Childhood Environment Rating Scale (ECERS-R; Harms & Clifford, 1998) for this subset at the centre level was 4.94 on average, very close to the cut-off typically used to distinguish 'fair/mediocre' and 'good' quality. Research typically shows that quality of FCC accessible to low-income families is usually lower than that observed in CBC (Dowsett, Huston, Imes, & Gennetian, 2008; Loeb et al., 2004; Morrissey, 2007; Votruba-Drzal et al., 2004). Language use by the child's caregiver/teacher was not assessed, however, given the Miami location, it is clear that both Spanish and English were likely used frequently with the children. Also, as described below, about 60% of the teachers chose to complete the child rating form in Spanish, indicating that was probably their strongest language.

Measures

LAP-D. Child cognitive, verbal, and fine motor skills were assessed through the Learning Accomplishment Profile – Diagnostic (LAP-D; Nehring, Nehring, Bruni, & Randolph, 1992), which is a standardised direct assessment for children between 30 and 72 months of age. The LAP-D was chosen by the MSRP community task force because it (1) matched up with the State's Early Learning Performance Standards (Florida Partnership for School Readiness, 2003), (2) was a nationally standardised, norm-referenced instrument yet designed to be curriculum-based (Nehring et al., 1992), (3) was available in both English and Spanish, and (4) had a high internal consistency according to the publisher. Winsler et al. (2008) found good internal consistency reliabilities (0.93–0.95) for both languages of assessment within the larger MSRP sample. Each of the domains (cognitive, verbal, and fine motor skills) has two subscales: (1) cognitive matching and counting, (2) fine motor writing and manipulation, and (3) language comprehension and naming. The LAP-D was administered at the beginning and end of the academic year (T1 September/October, T2 April/May) by trained bilingual assessors (social workers/school psychologists). As is standard practice, the language in which the child was assessed on the LAP-D was determined by a combination of the teacher's report of the child's strongest language and the assessor's impression after speaking to the child for a while in both languages (English/Spanish). County resources did not allow for bilingual children to be assessed in both languages. Sixty-three per cent of children were administered the LAP-D in Spanish at T1 and 62% at T2. Analyses were conducted to see if the language of child assessment mattered for performance, whether language varied by centre type, and whether the centre-type differences were different for assessments conducted in English or Spanish. Language of assessment did not vary by the centre type nor did it moderate centre type effects. In some cases, there were main effects for child language on the outcomes, with children performing slightly better on the LAP-D when it was given in English as opposed to Spanish.

DECA. Child social skills and behavioural problems were assessed by parents and teachers with the Devereux Early Childhood Assessment (DECA; LeBuffe & Naglieri, 1999) at the same T1–T2 periods as the LAP-D. Adults rated children's behaviour on four sub-scales: initiative, self-control, attachment, and behavioural concerns. Raters considered children in regard to their behaviour from the previous four weeks on a scale of (0 = never, 1 = rarely, 2 = occasionally, 3 = frequently, and 4 = very frequently). The first three subscales, initiative, self control, and attachment combine to make a total protective factors score, in which bigger numbers signal greater socio-emotional strengths. The behavioural problems subscale stood alone, with bigger numbers indicating greater behavioural problems. A sample question from the initiative

subscale includes 'starts or organizes play with other children', while an example item for self-control includes 'listens to/respects others'. For the attachment subscale, an example includes 'responds positively to adult comfort when upset', and an example of the behaviour scale items includes 'fights with other children'. Parents and teachers had the choice of completing the DECA in either English or Spanish. Sixty-one per cent of the teachers and 66% of the parents completed the Spanish form at T1 and 43% of the teachers and 65% of parents did so at T2.

In the standardisation sample, the DECA was reported to have internal consistency reliability alphas of 0.94 (teacher) and 0.91 (parent) for total protective factors and 0.80 (teacher) and 0.71 (parent) for behavioural concerns, and 1–3 day test-retest reliabilities of 0.94 (teacher) and 0.74 (parent) for protective factors and 0.68 (teacher) and 0.55 (parent) for behavioural concerns (LeBuffe & Naglieri, 1999). Internal consistency reliability within this Miami sample was 0.91 (parent) and 0.94 (teacher) for total protective factors, and 0.72 (parent) and 0.81 (teacher) for behavioural concerns (Winsler et al., 2008). Within the MSRP sample, reliability (and parent–teacher agreement) on the DECA has been shown to be strong and not to vary as a function of either language of form (English or Spanish) or rater (teacher–parent) (Crane, Mincic, & Winsler, 2011).

Results

Demographic differences

The first research question explored potential demographic differences in the Latino children who attended FCC versus CBC with a series of ANOVAs and Chi-Squares. ANOVA was used to examine the continuous variables of maternal age, maternal education, and family income. Chi-Square analysis was employed for categorical demographic variables – marital status, and immigration status. These demographic variables were selected because they are recognised as early risk factors for children's school readiness (Barrueco et al., 2007; Hair et al., 2006; Magnuson et al., 2006). Table 1 shows the demographic variables for the Latino children attending FCC versus CBC. Overall, no significant demographic differences were found between families with MSRP-assessed children that used subsidies for FCC versus CBC. Note that only a smaller, one-cohort subsample of cases ($n = 2857$) had data available for some of these variables. There is no reason to suspect that the demographics of childcare subsidy recipients would be different from year to year, given that they are all from the same community/population.

Fine motor skills. The main goal of this study was to describe potential differences in school readiness among children attending FCC versus CBC. For each outcome variable, a 2 Gender (male, female) X 2 Time (Fall, Spring) X 2 Centre-type (FCC, CBC) mixed ANOVA was conducted with time as the repeated measure and gender and centre type as between-subjects variables. The first domain analysed was fine motor skills in which CBC, ($n = 4727$) and FCC ($n = 86$) children were assessed at both T1 and T2. Tables 2 and 3 show both the T1 and T2 scores separately by gender and centre type. There was a significant main effect for time ($F [1, 4809] = 8.44, p < 0.01$), and an interaction of time-by-centre-type ($F [1, 4809] = 3.89, p < 0.05$), whereby children in CBC improved in fine motor skills over time, while children in FCC had little change (Figure 1). No significant gender-by-time interaction effect was found ($F [1, 4809] = 0.28, P > 0.10$), indicating that children of both genders

Table 2. School readiness by gender within CBC.

	Centre-based care					
	Boys		Girls		Overall	
	T1 <i>M</i> (SD)	T2	T1	T2	T1	T2
LAP-D						
	<i>n</i> = 2447	<i>n</i> = 2447	<i>n</i> = 2310	<i>n</i> = 2310	<i>n</i> = 4757	<i>n</i> = 4757
Fine Motor ^{a,b,c,d}	44.24 (28.1)	51.55 (27.0)	55.72 (28.9)	61.89 (25.7)	49.80 (29.4)	56.56 (26.9)
Cognitive ^{b,c,e}	37.54 (26.7)	42.81 (26.8)	42.42 (27.2)	47.05 (27.1)	39.91 (27.1)	44.87 (27.0)
Language ^{a,b,c,f}	27.62 (24.2)	33.67 (24.5)	31.06 (25.6)	38.89 (26.5)	29.29 (24.9)	36.20 (26.1)
DECA-Teacher						
	<i>n</i> = 2651	<i>n</i> = 2651	<i>n</i> = 2504	<i>n</i> = 2504	<i>n</i> = 5155	<i>n</i> = 5155
Social Skills ^{a,c,g}	49.06 (27.6)	54.33 (27.6)	59.94 (26.9)	65.60 (25.8)	54.35 (27.8)	59.81 (27.4)
Behaviour Concerns ^{c,e}	57.08 (28.0)	58.58 (27.6)	46.32 (27.8)	50.39 (29.3)	51.85 (28.4)	52.51 (28.5)
DECA-Parent						
	<i>n</i> = 2069	<i>n</i> = 2069	<i>n</i> = 1928	<i>n</i> = 1928	<i>n</i> = 3997	<i>n</i> = 3997
Social Skills ^{a,h,i}	46.00 (30.4)	51.37 (30.5)	51.44 (30.2)	56.41 (30.3)	48.62 (30.4)	53.8 (30.5)
Behaviour Concerns ^c	73.33 (26.6)	72.42 (26.9)	67.69 (28.9)	67.10 (28.5)	70.60 (27.9)	69.85 (27.8)

Notes: Values tabled separately by centre-type for clarity in Tables 2 and 3 but analyses conducted for all children combined.

^aSignificant time effect ($p < 0.05$) – children improved in school readiness over time in the areas of fine motor, language, and parent and teacher-rated social skills.

^bSignificant time-by-centre-type effect ($p < 0.05$) – children attending CBC showed greater gains in fine motor, cognitive, and language skills over time compared with those in FCC.

^cSignificant gender effect ($p < 0.05$) – collapsing across time, girls are doing better than boys in fine motor, cognitive, language, parent and teacher-rated social skills, and exhibit less parent-rated behavioural problems.

^dSignificant centre-type-by-gender effect ($p < 0.05$) – collapsing across time, gender differences are larger in FCC than CBC in areas of fine motor skills.

^eMarginal centre-type effect ($p = 0.06$) – collapsing across time, children in FCC show more behavioural problems and greater cognitive skills than those in CBC.

^fSignificant time-by-gender effect ($p < 0.05$) – boys showed different language gains over time than girls.

^gSignificant centre-type effect ($p < 0.05$) – collapsing across time, teachers in FCC report higher social skills than those in CBC.

^hSignificant time-by-centre-type-by-gender effect ($p < 0.05$) – difference between boy's and girl's social skills became larger over time but just in FCC.

ⁱMarginal gender effect ($p = 0.06$) – collapsing across time, regardless of centre, parents rate girls as having higher social skills than boys.

Table 3. School readiness by gender within FCC.

	Family childcare					
	Boys		Girls		Overall	
	T1 <i>M</i> (SD)	T2	T1	T2	T1	T2
LAP-D						
	<i>n</i> = 49	<i>n</i> = 49	<i>n</i> = 39	<i>n</i> = 39	<i>n</i> = 88	<i>n</i> = 88
Fine Motor ^{a,b,c,d}	40.28 (29.0)	42.45 (28.2)	65.72 (31.1)	66.13 (23.4)	51.81 (32.4)	53.19 (28.6)
Cognitive ^{b,c,e}	40.55 (29.1)	34.31 (26.7)	58.90 (29.6)	55.56 (27.4)	48.68 (30.6)	43.73 (28.9)
Language ^{a,b,c,f}	33.61 (27.5)	27.49 (23.0)	38.51 (27.8)	42.62 (24.6)	29.29 (24.9)	34.19 (24.8)
DECA-Teacher						
	<i>n</i> = 54	<i>n</i> = 54	<i>n</i> = 45	<i>n</i> = 45	<i>n</i> = 99	<i>n</i> = 99
Social Skills ^{a,c,g}	53.94 (29.4)	55.93 (28.2)	67.38 (24.6)	75.62 (20.9)	60.05 (28.0)	64.88 (26.9)
Behaviour Concerns ^{c,e}	66.68 (27.8)	63.62 (27.4)	46.34 (29.0)	50.39 (29.3)	57.45 (29.9)	57.62 (28.9)
DECA-Parent						
	<i>n</i> = 46	<i>n</i> = 46	<i>n</i> = 36	<i>n</i> = 36	<i>n</i> = 82	<i>n</i> = 82
Social Skills ^{a,h,i}	51.65 (28.3)	47.30 (30.2)	51.33 (33.3)	60.75 (28.3)	51.51 (30.4)	53.21 (29.9)
Behaviour Concerns ^c	71.76 (26.4)	77.00 (23.9)	60.43 (31.2)	61.16 (29.4)	66.65 (29.0)	69.85 (27.5)

Notes: Values tabled separately by centre type for clarity in Tables 2 and 3 but analyses conducted for all children combined.

^aSignificant time effect ($p < 0.05$) – children improved in school readiness over time in the areas of fine motor, language, and parent and teacher-rated social skills.

^bSignificant time-by-centre-type effect ($p < 0.05$) – children attending CBC showed greater gains in fine motor, cognitive, and language skills over time compared with those in FCC.

^cSignificant gender effect ($p < 0.05$) – collapsing across time, girls are doing better than boys in fine motor, cognitive, language, parent and teacher-rated social skills, and exhibit less parent-rated behavioural problems.

^dSignificant centre-type-by-gender effect ($p < 0.05$) – collapsing across time, gender differences are larger in FCC than CBC in areas of fine motor skills.

^eMarginal centre-type effect ($p = 0.06$) – collapsing across time, children in FCC show more behavioural problems and greater cognitive skills than those in CBC.

^fSignificant time-by-gender effect ($p < 0.05$) – boys showed different language gains over time than girls.

^gSignificant centre-type effect ($p < 0.05$) – collapsing across time, teachers in FCC report higher social skills than those in CBC.

^hSignificant time-by-centre-type-by-gender effect ($p < 0.05$) – difference between boy's and girl's social skills became larger over time but just in FCC.

ⁱMarginal gender effect ($p = 0.06$) – collapsing across time, regardless of centre, parents rate girls as having higher social skills than boys.

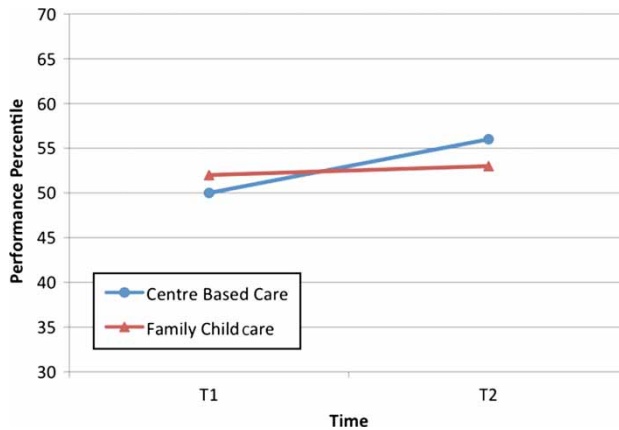


Figure 1. Fine motor skills at T1 and T2 for FCC versus CBC.

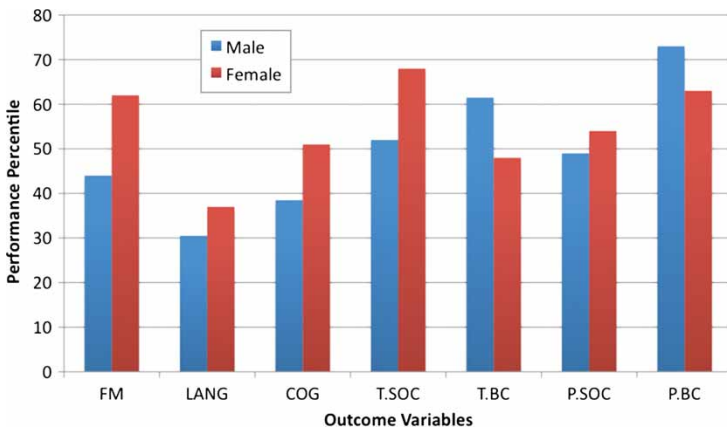


Figure 2. Gender differences in areas of school readiness (averaged across both time points). Notes: FM, fine motor skills; LANG, language skills; COG, cognitive skills; T.SOC, teacher social skills score; T.BC, teacher behaviour concerns; P.SOC, parent social skills score; P.BC, parent behaviour concerns.

showed the same patterns of growth over time. The three-way interaction of time, centre-type and child gender, was not significant ($F [1, 4809] = 0.01, p = 0.91$).

Next, between-subjects effects were examined. For centre-type, no significant differences were found averaging across time ($F [1, 4809] = 0.01, p = 0.91$), indicating that children in FCC and CBC showed similar overall levels of fine motor skills. Figure 2 shows a significant between-subject effect of child gender ($F [1, 4809] = 43.53, p < 0.001$), and as seen in Figure 3, there was also a significant gender-by-centre-type interaction ($F [1, 4809] = 6.45, p < 0.05$), for children's fine motor skills where females performed better than males in both CBC and FCC. However, a larger gender difference was present in fine motor skills in the FCC setting than in CBC.

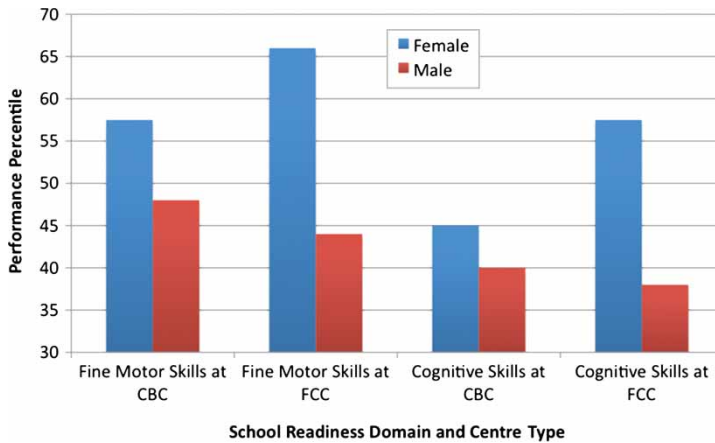


Figure 3. Fine motor and cognitive skills at FCC versus CBC for males and females (averaged across both time points).

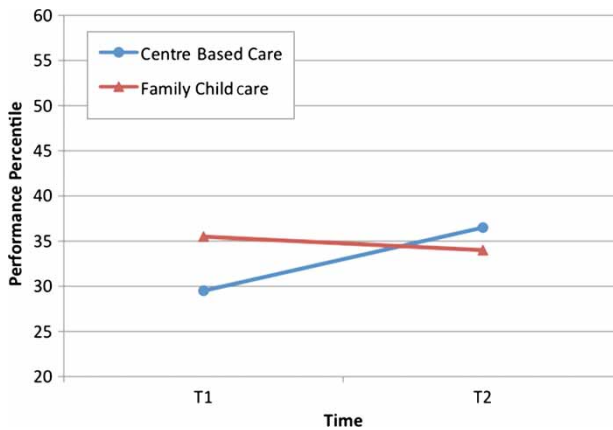


Figure 4. Language skills at T1 and T2 for FCC versus CBC.

Language skills. For the LAP-D language scale, children in CBC ($n = 4741$) and FCC ($n = 88$) were assessed at both T1 and T2. Results can be seen in Tables 2 and 3. There was a significant main effect for time ($F [1, 4825] = 5.00, p < 0.05$), and a significant time-by-centre-type interaction ($F [1, 4825] = 8.98, p < 0.05$), indicating that children who attended CBC improved more over time compared with children who attended FCC, who did not improve much in language skills (Figure 4). There was also a significant interaction for time and gender ($F [1, 4825] = 5.12, p < 0.05$), where females improved to a higher degree compared with males from T1 to T2. The time-by-centre-type-by-gender interaction was not significant ($F [1, 4825] = 2.54, P > 0.10$). For between-subjects analysis, no significant effect ($F [1, 4825] = 1.30, P > 0.10$) was found for centre-type averaging across time nor was there a centre-type-by-gender interaction ($F [1, 4825] = 1.39, P > 0.10$). A significant main

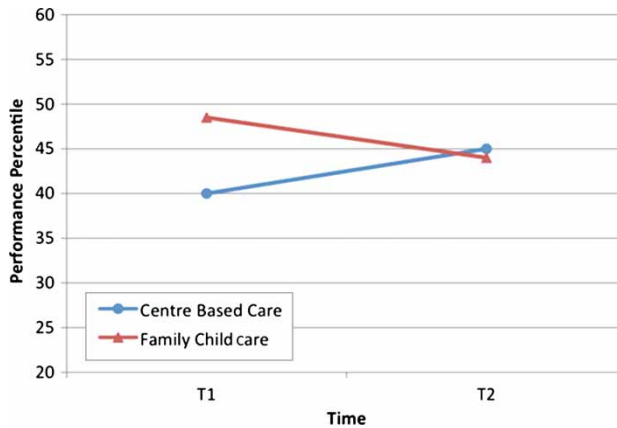


Figure 5. Cognitive skills from T1 to T2 for FCC versus CBC.

effect for gender was found again ($F [1, 4825] = 8.82, p < 0.05$), where girls outperformed boys in language (Figure 2).

Cognitive skills. For the LAP-D cognitive scale, children in CBC ($n = 4757$) and FCC ($n = 88$) were included. For the within-subject analysis of time, no significant effect was found ($F [1, 4841] = 0.004, P > 0.10$), nor was there a significant interaction with regard to time and gender ($F [1, 4841] = 0.18, P > 0.10$), indicating that both girls and boys showed similar overall levels of cognitive development over time. Figure 5 however, plots a significant interaction between time and centre type ($F [1, 4841] = 12.88, p < 0.001$), where children who attended CBC showed greater improvements over time when compared with children who attended FCC who showed some regression in cognitive skills compared with national norms. The interaction between time, centre type, and child gender was not significant ($F [1, 4841] = 0.43, P > 0.10$). For the between-subjects effect of centre type, a marginally significant difference emerged ($F [1, 4841] = 3.55, p = 0.06$). As seen in Figure 2, there was a significant gender difference ($F [1, 4841] = 22.18, p < 0.001$), and as seen in Figure 3, there was also a significant gender-by-centre-type interaction ($F [1, 4841] = 8.68, p < 0.05$), with Latino girls doing better in cognition compared with boys, however, the gender difference was larger in FCC than in CBC.

Teacher-rated social-emotional skills and behaviour. For the DECA-total protective factors scored by teachers, data were available for children in CBC ($n = 5155$) and children in FCC ($n = 99$). For the first within-subjects variable of time, there was a significant difference ($F [1, 5250] = 16.49, p < 0.001$), indicating that children's social skills generally improved over time. The time-by-centre type ($F [1, 5250] = 0.02, P > 0.10$), and gender-by-time interactions ($F [1, 5250] = 1.64, P > 0.10$) were not significant indicating that both girls and boys attending both CBC and FCC improved in social skills over time in similar ways. The interaction of time, centre-type and gender, was not significant ($F [1, 5250] = 1.27, P > 0.10$).

Between-subjects analysis of centre-type showed a significant main effect ($F [1, 5250] = 6.09, p < 0.05$), indicating that teachers rated children at both time points as having better social skills in FCC when compared with children in CBC. Figure 2 shows that there was also a significant difference for gender ($F [1, 5250] = 32.50, p < 0.001$), where girls had better social skills than

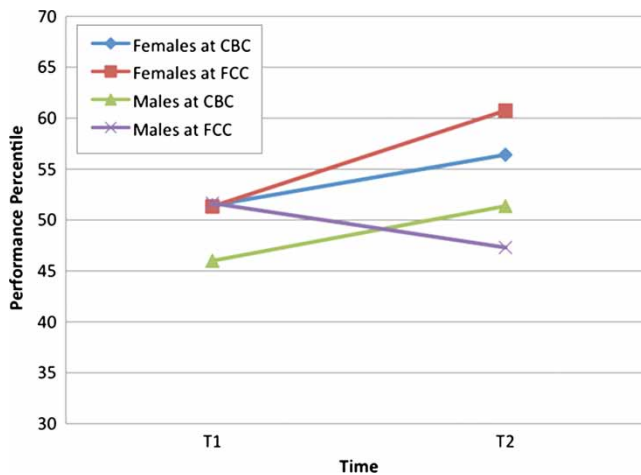


Figure 6. Parent total protective factors score (social skills) at T1 and T2 for females and males.

boys. Finally, the centre-type-by-gender interaction was not significant ($F [1, 5250] = 1.28, P > 0.10$), showing that the gender difference was similar in both CBC and FCC.

For behavioural concerns scored by teachers, children in CBC ($n = 5113$) and FCC ($n = 97$) were rated at T1 and T2. No significant effects were found for the within-subject test of time, ($F [1, 5206] = 0.18, P > 0.10$), time-by-centre-type ($F [1, 5206] = 0.00, P > 0.10$), nor time-by-gender ($F [1, 5206] = 1.00, P > 0.10$), indicating that regardless of centre-type selection and children's gender, children showed the same stability of behavioural problems over time. Finally, the three-way interaction of time, centre-type, and gender was not significant ($F [1, 5206] = 2.67, P > 0.10$).

For between-subjects effects, a marginally significant difference was found for centre-type ($F [1, 5206] = 3.51, p = 0.06$), suggesting that teachers rated children in FCC as having more behavioural concerns than those in CBC. As can be seen in Figure 2, there was a significant gender effect ($F [1, 5206] = 31.61, p < 0.001$), which shows that overall, girls showed fewer behavioural concerns than boys when averaging across both time points. No interaction was found for centre-type by child gender ($F [1, 5206] = 1.05, P > 0.10$), indicating that the gender difference found in behavioural concerns was the same for those in CBC and FCC.

Parent-rated social-emotional skills and behaviour. For the DECA total protective factors scale scored by parents, children in CBC ($n = 3997$) and FCC ($n = 82$) were assessed at T1 and T2. The main effect of time was significant ($F [1, 4075] = 6.23, p < 0.05$), where children generally improved over time, but see the interaction below. There was no interaction of time and centre-type ($F [1, 4075] = 0.73, P > 0.10$). The three-way interaction of time by centre-type by gender interaction, however, was significant ($F [1, 4075] = 5.25, p < 0.05$). Figure 6 demonstrates that although girls showed significant gains in social skills in FCC and in CBC, boys in FCC showed regression according to parents in terms of social skills.

For between-subjects effects, no significant effect was found for centre-type ($F [1, 4075] = 0.23, P > 0.10$), showing that parents scored children in both FCC and CBC similarly. There was a significant between-subject effect of gender averaging across

time ($F [1, 4075] = 3.77, p < 0.05$), indicating that girls outperformed boys in the area of social skills assessed by parents (Figure 2). The centre-type-by-gender interaction was not significant ($F [1, 4075] = 0.05, P > 0.10$).

For parent-rated behavioural concerns, assessments were available for children attending CBC ($n = 3973$) and FCC ($n = 82$). There were no significant within-subject or between-subject effects, except for a significant gender effect ($F [1, 4051] = 12.61, p < 0.001$), indicating parents thought boys showed more behavioural problems than girls at both time points (Figure 2).

Discussion

With the population of Latino children growing rapidly and concerns rising about the school readiness and school performance of this group of children facing numerous risk factors, it is critical to examine the school readiness trajectories of Latino children attending a variety of different early care and education settings (Garcia & Jenson, 2009; US Census Bureau, 2001, 2010). Little is known about the impact of various early childcare experiences among specifically low-income Latino populations. Given previous findings that Latino families from some communities may be likely to select FCC over CBC, and research showing that CBC may stimulate children's cognitive and linguistic school readiness stronger than FCC (Fuller et al., 1996; Loeb et al., 2004; Zambrana & Morant, 2009), the current study contributed to the literature by examining multiple aspects of school readiness over time in a large and understudied population of low-income Latino children receiving subsidies to attend either CBC or FCC.

It is important to note that although our sample is certainly not representative of all Latino families attending family-based and informal childcare in Miami, it is representative of those low-income families *receiving childcare subsidies* and attending CBC and FCC in the county. Also notable was that fact that children and families utilising these two different types of childcare in our sample did not differ on family income, maternal education, maternal age, marital status, or immigrant status. Methodologically, this is important in that with demographically similar groups, the present study did not appear to suffer from selection effects. Theoretically, it is also notable that, at least in the Miami context, with a sample restricted to Latino families in poverty, once the barrier of access to childcare subsidies is removed (as it is in the present study since participants are all subsidy recipients by definition), Latino families who choose FCC do not appear to be different from those who choose CBC, at least not on the limited background variables described above that were available to us. The fact that most subsidy-receiving families were using CBC suggests that perhaps in communities like Miami, where Spanish-speaking CBC providers are widely available, Latino families do not have a preference for FCC.

Our hypothesis regarding children attending CBC showing better pre-academic (cognitive, language, fine motor) growth over time than those in FCC was generally supported, as indicated by significant group-by-time interactions showing larger gains made in these areas for children attending CBC. However, this finding was made more interesting by the fact that children in FCC settings started out their pre-k year in somewhat better shape in cognitive and language skills than those attending CBC (as seen in Tables 2 and 3 and Figures 4 and 5). Nevertheless, it is children's growth over time and status at the end of the pre-kindergarten year that is likely important for school readiness next year, and Latino children in CBC did have an advantage

at the end of the year over those in FCC who showed little gains and some regression in these areas compared with national percentiles for similarly aged children. Although most children show growth over time in academic and social achievement, these children from this sample are at much risk and are struggling compared with national norms. This finding is consistent with previous research with different populations showing enhanced cognitive and language growth specifically in CBC (Burchinal et al., 2000).

There was little support for our hypothesis that children who attended FCC would show better socio-emotional and behavioural development. In terms of behavioural problems reported by teachers and parents, there was little change over time, and such change did not vary by the centre type. What is more, teachers in FCC settings actually reported marginally significantly *more* child behavioural problems than teachers in CBC. For teacher-reported child social skills, there was some support for the hypothesis in that teachers at FCC rated the children at both time points as having stronger socio-emotional skills compared with those in CBC. Growth over time in social skills, however, was similarly positive for children in both types of centres. However, *parents* reported that child social skills, specifically for boys in FCC settings, declined over time while they increased over time for all other gender/care-type groupings. Thus, there did not appear to be many socio-emotional advantages associated with FCC to counteract losses observed in areas of other pre-academic skills, and in the case of social skills in boys as reported by parents, there may even be some liabilities. Despite the preference that some Latino families may have to enroll their children in FCC (Fuller et al., 1996; Zambrana & Morant, 2009), the evidence from this study suggests that it may be better in terms of their overall school readiness, for low-income Latino children to be attending CBC.

Interestingly, numerous gender differences emerged. Most notable were consistently significant gender main effects (Figure 2) showing that regardless of centre type and time of assessment, young Latino girls in poverty were better off than Latino boys in every aspect of school readiness measured, either assessed directly or as reported by parents or teachers. For the area of language development, the gender difference got larger from the beginning to the end of the pre-kindergarten school year. This is important since it may be that young Latino boys in poverty may need additional supports upon the transition to school. There is a small literature showing African-American boys to be at particular risk early on (Burchinal et al., 2000; Entwisle et al., 2007), but increased early school risk for specifically Latino boys has not been examined and is an area ripe for future study. Of perhaps even more concern was that observed gender differences in performance were often notably larger in the FCC setting as indicated by several significant interactions between centre-type and gender. For cognitive and fine motor skills, the gender gap in performance was larger in FCC settings than in CBC. Finally, as discussed above, parents reported that boys specifically in FCC regressed in their social skills over time. The reasons why low-income, Latino boys in FCC in this community do not do very well are unclear. Perhaps, gender stereotypes and differential gender socialisation are more prominent in the FCC settings. Perhaps the increased behavioural problems observed in boys disrupt the learning opportunities that boys receive in FCC homes more than in CBC because the increased structure typically found in CBC helps them stay on track. These are testable hypotheses that should be explored in future research.

With the increasing population of Latino children, it is critical to understand the best way to help such children transition to kindergarten without getting behind their peers.

Understanding gains made in cognitive, language, motor, socio-emotional, and behavioural readiness in a variety of early childhood settings within this demographic group (and others) is critical for policies intended to reduce early achievement gaps. Many current policies, such as the 'No Child Left Behind Act' of 2002, although they may say things like 'all children should start ready for school', they actually only focus on K-12 education, and thus do not directly address gaps in school readiness at its foundation – that many groups of children are already behind their peers before kindergarten begins, and once they are behind, they are less likely to do well later in elementary school and high school (Phillips, Crouse, & Ralph, 1998). Although many states have initiated voluntary or universal pre-K programmes to enhance the school readiness of children, most states are focusing on CBC rather than FCC. Indeed, policy interest in early childhood programmes is now quite strong with our growing knowledge of the positive effects of early childhood intervention, high-quality childcare, and programmes like Head Start and state-funded pre-k (Barnett, Epstein, Friedman, Boyd, & Hustedt, 2009; Gormley & Phillips, 2005; Hart, 2005; Love et al., 2005; Ryan et al., 2011). As pointed out by Garcia and Jensen (2009), Latinos form a demographic imperative whose special needs need to be considered within the early childhood policy debate.

The results of the present study point to the possibility that the school readiness needs of young Latino children in poverty, especially boys, may not be met well in the context of FCC, and that there are numerous advantages for such children to attend CBC. Such findings noting the benefits of CBC are consistent with other research with broader samples (Burchinal et al., 2000) and certainly consistent with current policy movements advocating universal and targeted pre-k programmes (Barnett, 2010; Dotterer, Burchinal, Bryant, Early, & Pianta, 2009; Reynolds & Temple, 2006; Zigler, Gilliam, & Jones, 2006). It is important for all families (including Latino families) to have many childcare options available to meet their individual family's childcare needs, and indeed, the option for parents to choose what type of childcare they use (including FCC, CBC, or informal childcare) is appropriately built into the subsidised childcare system (Ryan et al., 2011). Research indicates that low-income families are able to acquire higher-quality childcare with their use of childcare subsidies than they would without this assistance, and that the increase in quality is often due to families with subsidies choosing CBC over other options (Ryan et al., 2011). FCC may be a preferred option for some Latino families (Fuller et al., 1996; Zambrana & Morant, 2009), and low-income families in general, and Latino families in particular, have limited access to high-quality childcare and they experience many barriers navigating the subsidised childcare system (Barton & Educational Testing Service, 2003; Loeb et al., 2007; NIEER, 2007). Given this, it is important to (a) increase the availability of high-quality childcare in general, for low-income Latino families, (b) implement effective parent education campaigns so Latino parents can learn about the pros and cons of different types of childcare choices in terms of promoting school readiness, and (c) increase the availability and uptake of specifically CBC/pre-k programmes for Latino children in poverty. Also critical is the need to improve the quality of FCC through professional development, coaching and enhanced regulation (Koh & Neuman, 2009; Neuman, & Cunningham, 2009).

Although the present study is limited in that we were only able to use archival data sometimes collected for other purposes, this kind of applied research, at-scale, in collaboration with local community agencies engaged in their own programme evaluation

is also a strength in that it provides the much-needed ecologically valid data about children's school readiness progress using real-world, local community standards, and instruments. Given that the present study took place in Miami Florida, where there is likely more access for Latino families to find Spanish-speaking (or at least Spanish-positive) teachers in CBC settings, it is important for future research to see if the findings here would replicate in other communities where Spanish-speaking teachers are less available. Also, future research should examine whether differences in school readiness observed here as a function of centre type remain longitudinally into the early elementary school years. The current study was limited in that we did not have demographic data on the families for all years/cohorts. However, there is little reason to suspect that the demographics of childcare subsidy recipients in the same community would change much from year to year.

In summary, the present study provided new analyses on the school readiness trajectories of a relatively understudied population of low-income, Latino children receiving subsidies to attend CBC or FCC. All children generally showed improvements over time in most domains. However, Latino children, especially boys, attending CBC showed better outcomes and gains from the beginning to the end of the year on cognitive, motor, social, and language measures of school readiness. These findings are consistent with prior research that has found that children who attend CBC may be at an advantage for some aspects of school readiness (Burchinal et al., 2000; Clarke-Stewart & Allhusen, 2005; Loeb et al., 2004). FCC, at least in this community, did not appear to be optimum for fostering the school readiness of low-income Latino children, especially boys.

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