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Child Care Subsidies and the School Readiness of Children of Immigrants

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This study is the first to test whether receipt of a federal child care subsidy is associated with children of immigrants' school readiness skills. Using nationally representative data ($n \approx 2{,}900$), this study estimates the associations between subsidy receipt at age 4 and kindergarten cognitive and social outcomes, for children of immigrant versus native-born parents. Among children of immigrants, subsidized center-based care (vs. subsidized and unsubsidized home-based care) was positively linked with reading. Among children of native-born parents, those in subsidized center care displayed poorer math skills than those in unsubsidized centers, and more externalizing problems than those in unsubsidized home-based care.

Children of immigrants are among the nation's fastest growing demographic subgroups (Haskins & Tienda, 2011): Nearly a quarter of U.S. children have at least one foreign-born parent (Passel, 2011). The number of *young* children of immigrants is also quite high; in 2008, 24% of U.S. births were to immigrant mothers (Passel & Taylor, 2010). Although immigrant families are quite diverse, unfortunately, nearly 50% of young children of immigrants live in low-income households (Mather, 2009). These children are also more likely to have mothers with low levels of education and English fluency (Haskins & Tienda, 2011).

In light of the aforementioned risk factors, it is not surprising that children of immigrants lag behind children of native-born parents on school readiness (e.g., Crosnoe, 2007; Han, 2008; Magnuson, Lahaie, & Waldfogel, 2006). Children of immigrants are also less likely to experience nonparental early care and education (ECE)—especially center-based ECE—in the years before kindergarten (e.g., Brandon, 2004; Karoly & Gonzalez, 2011; Miller, Votruba-Drzal, & Coley, 2013; Turney & Kao, 2009). This discrepancy is important, because ECE and in particular center-based ECE have been found to promote school readiness (e.g., Gormley, Gayer, Phillips, & Dawson, 2005; Loeb, Bridges, Bassok, Fuller, & Rumberger, 2007; National Institute of Child Health and Human Development Early Child Care Research Network [NICHD ECCRN] & Duncan, 2003) for Hispanic and English language-learning children specifically (Gormley, 2008; U.S. Department of Health and Human Services, Administration for Children and Families, 2010b).

A previously ignored potential pathway for supporting the school readiness of the growing and vulnerable subgroup of low-income children of immigrants is the state-administered, predominantly federally funded child-care subsidy program (the Child Care and Development Fund). One of the government's most substantial investments in ECE for low-income children, the subsidy program cost more than $7 billion in 2010 and served nearly 1.7 million children per month, rivaling other public ECE programs like Head Start and public pre-k (National Institute for Early Education Research, 2010; U.S. Department of Health and Human Services, Administration for Children and Families, 2010a; U.S. Department of Health and Human Services, Administration for Children and Families, Office of Child Care, 2010; U.S. Department of Health and Human Services, Administration for

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Children and Families, Office of Head Start, 2010). The subsidy program was designed primarily to support parental employment, allowing parents to use their subsidy with almost any provider who meets their needs, including in community-based centers (CBCs), licensed family child-care homes, and in more informal home-based care provided by family, friends, or neighbors in the home of the caregiver or the child. To be eligible for a subsidy, family income must not exceed the state maximum for that family's size and parents must work or be engaged in an approved work-related activity (i.e., a job search, school, job training).

Research suggests that subsidies increase the use of center-based ECE (e.g., Berger & Black, 1992; Blau & Tekin, 2007); among subsidy-eligible families, subsidies also elevate care quality but only for home-based care users (e.g., Johnson, Ryan, & Brooks-Gunn, 2012; Ryan, Johnson, Rigby, & Brooks-Gunn, 2011). Since exposure to center-based ECE and exposure to higher quality ECE have been linked to enhanced child development (e.g., Burchinal et al., 2000; NICHD ECCRN & Duncan, 2003), it seems theoretically plausible that subsidy receipt would boost school readiness.

However, research on the direct effects of subsidies in the general population has found either negative or neutral effects on child kindergarten cognitive and social development (Hawkinson, Griffen, Dong, & Maynard, 2012; Herbst & Tekin, 2010a, 2010b; Johnson, Martin, & Brooks-Gunn, 2013). Given that there is variability in the type of care parents can purchase with their subsidies, and that care quality varies by care type (e.g., Li-Grining & Coley, 2006; Rigby, Ryan, & Brooks-Gunn, 2007), it has been hypothesized that the observed negative effects of subsidies may derive from variation in quality across the settings in which the subsidy is used. Only one study formally tested this proposition, finding a negative association between subsidies and math outcomes but only for children in subsidized versus unsubsidized CBC care (Johnson et al., 2013). The authors posited that CBCs that serve low-income children vary in the extent to which they stimulate math development: The CBCs with specially trained staff members and the most stimulating numeracy materials are only accessible to families who privately pay for care (i.e., subsidy nonrecipients), while the CBCs that are least equipped to promote math skills serve the most disadvantaged children—subsidy recipients.

However, this pattern may differ for immigrant families; it may even reverse. In particular, with regard to reading development for children of immigrants, CBC care purchased with a subsidy, even if of lower quality by some criteria, could potentially promote reading growth by providing more English-language books and other literacy materials than a typical home-based or parental care setting used by these children. Additionally, the presence of multiple peers and caregivers may provide greater exposure to language than that found in home-based or parental care. Conversely, math skills might not be promoted for these children if the supply of high-quality care is truncated in immigrant communities, as has been found (Radey & Brewster, 2007), particularly if math is harder for average caregivers to effectively teach and beneficial effects on math preparation are only found in the highest quality settings. On the other hand, as hypothesized with reading, children of immigrants who experience subsidized CBC care might benefit from having greater exposure to math materials and curricula and thus demonstrate better math outcomes than their peers in alternate modes of care.

We have little basis on which to hypothesize how subsidies will be associated with behavior outcomes for this population; children of immigrants consistently display fewer behavior problems than those with native-born parents (DeFeyter & Winsler, 2009; Han, Lee, & Waldfogel, 2012), possibly because immigrant parents emphasize social and behavioral competence (e.g., Perreira, Chapman, & Stein, 2006). Nevertheless, if subsidies increase exposure to CBC care, we might expect negative associations with behavior, because center-based care use has been linked to increased behavior problems in the general population (e.g., Belsky et al., 2007), though not among English-proficient Hispanic children (Loeb et al., 2007). As with reading and math, the association between subsidies and outcomes is likely to vary by the setting in which the subsidy is used.

Separately from CBC care, subsidized *home-based* care may promote the school readiness of children of immigrants if subsidies increase immigrant families' use of formal home-based care, which tends to be higher in quality than informal home-based care (e.g., Johnson et al., 2012; Rigby et al., 2007). However, it may be more likely that immigrant families use subsidies to purchase informal care, often from family members, friends, or neighbors who are not professionally trained or licensed to provide care. Immigrant parents who prefer culturally consistent ECE and a caregiver who speaks the child's home language may select an informal provider to preserve the child's fluency in that language (Fuller,

Holloway, Rambaud, & Eggers-Pierola, 1996; Lowe & Weisner, 2004). Unfortunately, home-based care providers who serve low-income children are often themselves low income, with low levels of education (Phillips & Morse, 2011). Lower quality informal care with a non-English-speaking provider, whether subsidized or not, is unlikely to help school readiness skills assessed in English and may even be harmful, especially for children for whom child care may be the only opportunity for exposure to English.

To test these hypotheses, we explore associations between subsidy receipt in the year before kindergarten entry and children's kindergarten reading, math, and externalizing behavior outcomes, by parental immigrant status. Importantly, we account for the full range of ECE settings that subsidy recipients and nonrecipients experience, and test whether the links between subsidy use and kindergarten outcomes vary across the different ECE types. Knowing whether subsidies are differentially related to the outcomes of children of immigrant versus native-born parents, and in which ECE settings those effects are located, would provide valuable information to researchers and policy makers seeking to maximize the potential developmental benefits of the subsidy program for a subgroup at particular risk for early school failure.

Method

Data and Sample

Data are drawn from the Early Childhood Longitudinal Study–Birth Cohort (ECLS–B), a nationally representative study of children born in 2001. Primary caregivers (in more than 95% of cases, the biological mother or female guardian) were interviewed and children were assessed in 2001 when they were 9 months old, in 2003 when they were 2 years old, in 2005–2006 when they were in preschool, and in 2006–2007 when they were in kindergarten. Because not all children entered kindergarten in the same year, kindergarten data were collected in two waves. At the preschool wave, ECE providers (and center directors) were interviewed by phone about characteristics of the care and children served. At the kindergarten wave, teachers completed questionnaires that included items about the child's social development. The current study uses data from all waves.

Analyses focused on families with household incomes at or below 200% of the federal poverty line in the child's preschool year, an income cutoff that approximates most states' income limit for subsidy eligibility. Weights were applied to account for the study's complex sampling design, oversampling of certain populations (e.g., twins, Asian-Pacific islanders), and for survey nonresponse; the weighted sample is representative of all children born in the United States in 2001. Missing data on covariates, though negligible, were multiply imputed using the imputation for chained equations procedure in Stata Version 11 StataCorp. (n.d.). Stata statistical software: Release 11. College Station, TX: Author. and estimates were combined across imputed data sets via the MIM command. The final analysis used a sample of approximately 2,900 children with kindergarten cognitive assessment data and approximately 2,300 children with kindergarten teacher-reported externalizing behavior data (all *N*s are rounded to the nearest 50 in compliance with National Center for Education Statistics [NCES] security standards).

Measures

Subsidy Receipt

Subsidy receipt was measured using information collected in the child's prekindergarten (pre-k) year: the preschool wave of data collection, in 2005–2006, for children who entered kindergarten in 2006, *or* the first (2006) kindergarten wave, which collected preschool information on children who entered kindergarten in 2007. Data were obtained from parents and, when possible, from child-care providers and center directors. Following prior studies (Forry, 2009; Herbst, 2008), parents who reported that "a social service or welfare agency" helped pay for the child's primary ECE arrangement were coded as receiving subsidies. Parents who stated that the primary arrangement was free center-based care (that was not Head Start or public pre-k) were also coded as subsidy recipients. Parents who said that the primary arrangement was free home-based care were categorized as subsidy recipients if the provider also reported that he or she was licensed or part of a family child-care network, supplied care in the provider's home, and cared for three or more unrelated children. This last condition was used to differentiate free, informally provided home-based care (e.g., that is provided by a grandparent) from subsidized home-based care (where the subsidy covers the entire cost). We recognize this may undercount families using subsidies in informal home-based care, but assume that most of those families were captured in the first step. In the

current study, approximately 14% of families were coded as subsidy recipients.

Children coded as *not* receiving subsidies were classified into one of four mutually exclusive groups, according to their primary care arrangement: Head Start, public pre-k, unsubsidized nonparental care, or parental care. To identify Head Start and public pre-k recipients, we drew on parent responses, as well as center director or child-care provider reports (when available). Children were considered to be in unsubsidized nonparental care if they did not receive any publicly funded care (subsidies, Head Start or public pre-k). Unsubsidized nonparental care could occur in either a center- or home-based setting.

Maternal Immigrant Status

Our measure of maternal immigrant status was obtained from birth certificate data, which the ECLS–B used in drawing the study sample. At the child's birth, mothers reported whether they were foreign born or U.S. born. In our sample, approximately 28% of mothers were foreign born.

Child Care Setting

We identified five mutually exclusive primary ECE settings: Head Start, public pre-k, CBC care (care at a center that is not a Head Start or a public pre-k), home-based care, or parental care. CBC and home-based care were further divided by subsidy status. Thus, our regression analyses included indicators for subsidized and unsubsidized CBC care, Head Start, public pre-k, and subsidized and unsubsidized home-based care, with parental care as the reference group.

Kindergarten School Readiness Outcomes

All kindergarten outcomes were measured in the fall of the year the child first attended kindergarten and, to ease interpretability, were standardized to have a mean of 0 and a standard deviation of 1. Reading and math skills for nearly all children were assessed in English, as children had only to answer a simple screener question correctly in order to proceed with testing in English (< 1% of cases were excluded for language barrier reasons).

Reading. Reading ability was assessed using a measure developed specifically for the ECLS–B, which evaluated letter and letter–sound knowledge, print conventions, and expressive and receptive vocabulary skills. We use item response theory (IRT) scale scores, calculated by the ECLS–B.

Math. Using a measure developed for the ECLS–B, the math assessment evaluated children's number sense, properties, operations, measurement, and geometry and spatial abilities. Again, IRT scale scores provided by the ECLS–B were used.

Externalizing behavior problems. Using items from the Preschool and Kindergarten Behavior Scales–Second Edition (Merrell, 2003) and the Social Skills Rating Scale (Gresham & Elliot, 1990), kindergarten teachers rated children's behavior on a 5-point scale. We created a measure of externalizing behavior by averaging seven items rating how aggressive, impulsive, and disruptive the child was ($\alpha = .92$); higher scores indicate more behavior problems.

Covariates

In multivariate models, we controlled for a comprehensive set of covariates, including standard demographic characteristics, prior measures of child cognitive and behavioral skills, prior subsidy receipt and nonparental care use, and child characteristics at assessment. The full list of covariates used as controls appears in the Table 2 note.

Results

Descriptive Statistics: Comparing Children of Immigrants to Children of Native-Born Parents

Table 1 presents mean differences on all study measures between low-income children of immigrants and low-income children of native-born parents. As expected, children of immigrants were more likely to have mothers who identified as Hispanic or Asian/other race, whereas children of native-born parents were more likely to have mothers who identified as White or Black. Regarding socioeconomic characteristics, even in a low-income sample, children of immigrants tended to be more disadvantaged than children of native-born parents. Children of immigrants were more likely to live in urban areas, with more other children in the home, and with mothers who had lower levels of education, were not English proficient, and were unemployed. Consistent with the literature on immigrants and family structure, children of immigrants were less likely to have a single mother than were children of native-born parents. Children of immigrants were less likely to have a diagnosed special need, to have experienced prior nonparental care, or to have received a subsidy; they also had lower cognitive scores at age 2 than those with

Table 1
Sample Descriptive Statistics

	All families 200% FPL and below % *M* (*SD*)	Children of native-born parents % *M* (*SD*)	Children of immigrants % *M* (*SD*)
Family background characteristics			
Maternal race			
Mother is White**	40.0	52.8	4.2
Mother is Black**	21.1	27.2	4.3
Mother is Hispanic**	33.0	15.0	83.6
Mother is Asian/other race**	5.8	5.0	7.9
Maternal education			
Mother has < HS education**	32.0	25.4	50.5
Mother has HS diploma or GED**	42.4	45.2	32.6
Mother has some college**	22.3	26.3	12.5
Mother has BA or higher	3.5	3.0	4.4
Mother is single**	29.4	35.2	12.7
Mother is proficient in English*	80.8	98.8	29.6
Mother < age 20 at focal child's birth*	18.1	20.4	11.4
Number of children in HH, ≤ age 6	.78 (0.9)	.78 (0.8)	.80 (0.9)
Number of children in HH, ≥ age 7**	.67 (1.0)	.62 (0.9)	.82 (1.1)
Family lives in an urban area**	67.9	61.0	88.5
Maternal employment			
Mother works full time	28.0	29.1	25.0
Mother works part time**	16.3	18.8	9.5
Mother is in school/job training/looking**	17.8	20.3	11.1
Mother is not in labor force**	37.8	31.9	54.4
Food insecurity since child's birth	29.2	28.8	30.8
Child age at assessment (in months)	68.1 (4.3)	68.2 (4.4)	67.9 (4.3)
Child entered kindergarten in 2006	73.0	71.7	76.2
Child has a diagnosed disability*	8.5	9.3	6.2
Child is male	52.4	51.6	54.4
Child received any nonparental care prior wave**	40.5	44.6	28.7
Child received a subsidy at prior wave**	12.4	14.5	6.3
Earlier outcomes			
Bayley mental scale score, age 2**	124.7 (9.9)	125.6 (10.0)	122.1 (9.0)
Child adaptive behavior, age 2	3.4 (0.8)	3.4 (0.8)	3.4 (0.8)
Child-care type			
Community-based center*	25.5	27.0	21.5
Head Start	18.3	18.1	19.0
Public pre-k	15.9	15.1	18.4
Home-based care*	18.1	19.5	14.1
Parental care**	22.2	20.4	27.0
Kindergarten outcomes			
Child reading ability, kindergarten**	39.5 (13.6)	40.2 (13.3)	37.4 (14.2)
Child math ability, kindergarten**	40.6 (9.8)	41.1 (9.8)	39.0 (9.7)
Child externalizing behavior, kindergarten**	2.0 (0.8)	2.1 (0.8)	1.8 (0.8)
N	2,900	2,200	700

Note. All *N*s rounded to nearest 50 per NCES requirements; all estimates are weighted. FPL = federal poverty line; HS = high school; GED = general education diploma; BA = bachelor's degree; HH = household; pre-k = prekindergarten; ECLS–B = Early Childhood Longitudinal Study–Birth Cohort. Tests of statistical significance compare children of immigrants to children of native-born parents. Source: ECLS–B 9-month-kindergarten restricted use data file.
*$p < .05$. **$p < .01$.

native-born parents. In line with studies on child-care selection among immigrant families, highlighted earlier, children of immigrants were less likely to experience CBC or home-based care and more likely to experience parental care in the preschool year. And in accord with prior research

on school readiness, bivariate associations revealed that children of immigrants scored lower on measures of reading and math but displayed fewer externalizing behavior problems, relative to children of native-born parents.

Regression Results: Predicting Kindergarten Outcomes From Subsidy Receipt

We next estimated separate ordinary least squares regression models predicting kindergarten reading, math, and externalizing behavior scores from subsidy receipt in the preschool year. Each model included all covariates as well as a measure of cognition or behavior (as appropriate), drawn from the 2-year wave, to reduce selection bias due to unmeasured child and family characteristics associated with subsidy receipt and kindergarten outcomes. Models were run on children of immigrant and native-born parents, separately, and postestimation Chow tests were used to compare significant coefficients across models.

Three specifications were estimated for each outcome: Model 1 included a single subsidy receipt dummy variable, showing the average association between subsidies and the dependent variable. The reference group in this specification includes nonrecipients of subsidies, regardless of their care type. Model 2 unpacked the average subsidy effect by nonparental care use, comparing subsidy recipients separately to nonrecipients in any form of nonparental care versus those in parental care (omitted). Model 3 further divided subsidy receipt and nonreceipt by specific care setting, replacing the indicators for subsidy receipt or nonreceipt with six mutually exclusive dummy variables indicating subsidized care in a CBC or home-based setting, or unsubsidized care in a CBC, Head Start, public pre-k, or home-based setting. Here, as with Model 2, the omitted group was parental care.

Results from Model 1 in Table 2 suggest that for children of immigrants, there was no significant average association between subsidies and any of the three outcomes. The pattern for children of native-born parents, however, follows recent research on the general population (Hawkinson et al., 2012; Herbst & Tekin, 2010a, 2010b): Specifically, for these children there was a trend-level negative association between subsidy receipt and math performance and a trend-level positive association between subsidy receipt and externalizing behavior (signifying more behavior problems); the coefficient on reading was also negatively signed. However, postestimation comparisons of subsidy coefficients across immigrant subgroups were not statistically significant at conventional alpha levels.

Results from Model 1 compared subsidy recipients to all nonrecipients, regardless of whether the subsidy nonrecipient attended nonparental care or stayed home with a parent. Therefore, it could be that these estimates conceal substantial variability in subsidy effects across care settings. Indeed, Model 2 results suggest that this may be the case. The association between subsidy receipt and all three outcomes was neutral among children of immigrants. Among children of native-born parents, however, a statistically significant negative association between subsidies and math emerged only relative to unsubsidized nonparental care, while a statistically significant positive association between subsidies and externalizing behavior problems was only observed relative to parental care; however, postestimation tests between the two subgroups did not achieve standard significance levels. While informative, these results raise further questions about *which* subsidized and unsubsidized settings might explain these effects.

When results were disaggregated by care type in Model 3, we see negative associations between subsidies and reading for children of immigrants. Specifically, subsidized home-based care was negatively associated with reading, relative to parental care. Conversely, subsidized CBC care was unrelated to reading performance relative to parental care, but *positively* associated with reading compared to subsidized and unsubsidized home-based care; postestimation tests confirm these coefficients were reliably different across subgroups ($p < .05$). For math and externalizing behavior among children of immigrants, there were no significant associations with subsidy receipt regardless of care type.

Among children of native-born parents, however, the average negative subsidy effects observed in prior studies, and largely supported in Models 1 and 2, were confined to subsidized CBC care. Specifically, among children of native-born parents, subsidized CBC was negatively associated with reading and math relative to unsubsidized CBC care (although postestimation comparisons across subgroups were not significant at conventional alpha levels). This occurred because, consistent with the literature, unsubsidized CBC care was linked to increased reading and math ability relative to parental care. Subsidized CBC care was positively associated with externalizing behavior (indicating more behavior problems) relative to parental care, unsubsidized CBC, and unsubsidized home-based care, although in postestimation contrasts only the coefficient on the

Table 2
Estimates of Associations Between Preschool Year Subsidy Receipt and Kindergarten Child Cognitive and Social Outcomes, by Maternal Immigrant Status

	Reading				Math				Externalizing behavior problems			
	Immigrants		Native born		Immigrants		Native born		Immigrants		Native born	
	B	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*
Model 1												
Subsidy receipt, OLS estimate	0.04	0.14	−0.11	0.08	0.13	0.16	−0.12	0.07†	−0.05	0.19	0.17	0.09†
Model 2												
Subsidy	0.06	0.15	0.00	0.10	0.17	0.18	0.03	0.09	−0.04	0.21	0.25	0.11*
No subsidy	0.03	0.09	0.15	0.08†	0.06	0.11	0.19	0.07†	0.02	0.12	0.10	0.08
(Parental care omitted)	—		—		—		—		—		—	
Postestimation comparisons, Model 2												
Subsidy versus no subsidy	0.03	0.14	−0.15	0.08†	0.11	0.16	−0.16	0.07*	−0.06	0.19	0.15	0.09
Model 3												
Subsidy receipt												
Subsidy in a CBC	0.19	0.17	0.04	0.12	0.27	0.19	0.02	0.10	−0.09	0.24	0.32	0.12*
Subsidy in home-based care	−0.51	0.19*	−0.08	0.13	−0.19	0.39	0.06	0.13	0.09	0.36	0.07	0.16
No subsidy												
No subsidy in a CBC	0.15	0.15	0.31	0.10**	0.21	0.16	0.35	0.09**	−0.18	0.19	0.04	0.11
Head Start	0.14		0.10	0.09	0.06	0.13	0.16	0.08†	−0.14	0.14	0.17	0.10
Public pre-k	−0.02		0.20	0.09*	−0.02	0.15	0.19	0.09*	0.22	0.19	0.18	0.11
No subsidy in home-based care	−0.26	0.14†	0.00	0.10	0.05	0.14	0.04	0.10	0.10	0.19	−0.04	0.12
(Parental care omitted)	—		—		—		—		—		—	
Postestimation comparisons, Model 3												
Subsidy versus no subsidy in a CBC	0.04	0.20	−0.28	0.12*	0.05	0.21	−0.33	0.10**	0.10	0.25	0.28	0.13*
Subsidy versus no subsidy in home-based care	−0.25	0.21	−0.08	0.13	−0.24	0.38	−0.03	0.14	−0.02	0.36	0.11	0.17
Subsidy in a CBC versus subsidy in home-based care	0.70	0.23**	0.11	0.14	0.45	0.40	−0.04	0.14	−0.17	0.40	0.25	0.18

Table 2
Continued

	Reading				Math				Externalizing behavior problems			
	Immigrants		Native born		Immigrants		Native born		Immigrants		Native born	
	B	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*
Subsidy in a CBC versus no subsidy in home-based care	0.45	0.18*	0.04	0.10	0.21	0.19	−0.07	0.09	−0.19	0.30	0.37	0.14*
N	700		2,200		700		2,200		550		1,800	

Note. Sample is all low-income (200% FPL and below) families. *N*s rounded to nearest 50 per National Center for Education Statistics requirements. Standard errors are jackknife standard errors; all estimates are weighted. All models controlled for the following covariates: child age, year child first entered kindergarten, maternal race, maternal education, maternal marital status, maternal English proficiency, mother's age at child's birth, number of children in the household, urbanicity, maternal employment, household food insecurity, child disability status, child gender, whether the child received any nonparental care at age 2, whether the child received a subsidy at age 2, and the appropriate Wave 2 outcome. For children of immigrants, $n \approx 50$ in subsidized CBC, $n < 50$ in subsidized home-based care, $n \approx 100$ in unsubsidized CBC, $n \approx 150$ in Head Start, $n \approx 100$ in public pre-k, $n \approx 100$ in unsubsidized home-based care, $n \approx 200$ in parental care. For children of native-born parents, $n \approx 250$ in subsidized CBC, $n \approx 100$ in subsidized home-based care, $n \approx 300$ in unsubsidized CBC, $n \approx 500$ in Head Start, $n \approx 350$ in public pre-k, $n \approx 300$ in unsubsidized home-based care, $n \approx 400$ in parental care. OLS = ordinary least squares; pre-k = prekindergarten; CBC = community-based center; FPL = federal poverty line; ECLS–B = Early Childhood Longitudinal Study–Birth Cohort. Source. ECLS–B 9-month-kindergarten restricted use data file.
$^{\dagger}p < .10$. $^{*}p < .05$. $^{**}p < .01$.

comparison with unsubsidized home-based care was significant at the conventional $p < .05$ level.

Discussion

This study is the first to examine whether and in what settings child-care subsidies might influence the school readiness of children of immigrants. Considering the recent growth in the U.S. immigrant child population, alongside evidence that children of immigrants enter school less ready to learn than their counterparts, this is an important inquiry. Using nationally representative data from the ECLS–B, our results suggest a divergent pattern of associations between subsidies and school readiness for children of immigrants than what has been observed for children of native-born parents.

Unlike prior research on the general population, which linked the negative effect of subsidies to CBC care (Johnson et al., 2013), we found subsidized CBC care to be associated with *higher* levels of reading development among children of immigrants when compared to home-based care (subsidized or not). As initially hypothesized, it could be that exposure to CBC care, which features English print materials and language interactions with teachers and peers, promotes reading skills among children who might otherwise have limited English exposure. This finding is also consistent with research indicating that home-based care is of lower average quality than center-based care (Li-Grining & Coley, 2006; Rigby et al., 2007), and with a recent study suggesting that Latino preschoolers who attended subsidized CBC care demonstrated better school readiness than their demographically matched peers who attended subsidized home-based care (Ansari & Winsler, 2012). Interestingly, among children of immigrants no associations between subsidies and math or behavior problems were detected. Unlike reading, where any increase in language or print interaction might be sufficient to boost outcomes even in a mediocre quality setting, the stimulation of math and numeracy skills may require more concerted efforts, possibly by higher quality teachers (Ginsburg, Lee, & Boyd, 2008), which may simply not be available in low-income immigrant communities (Radey & Brewster, 2007). The absence of negative behavioral effects of subsidies may be due to immigrant children experiencing lower levels of behavior problems to begin with (DeFeyter & Winsler, 2009; Han et al., 2012).

For children of native-born parents, our results largely echo those of prior work on the general

population: Subsidies were negatively associated with math (e.g., Hawkinson et al., 2012; Herbst & Tekin, 2010a, 2010b), but this finding is largely constrained to users of CBCs (Johnson et al., 2013). Small cell sizes weakened our power to detect statistically significant cross-subgroup differences in associations, but patterns imply that the negative subsidy effect among children of natives extends to reading as well. As discussed, CBCs that serve subsidized children may be lower in quality than those that serve unsubsidized children, and may be less equipped with staff members and materials that stimulate early academic school readiness skills.

Again, weak power may have limited our ability to confirm observed differences across subgroup models, but the overall pattern suggests that children of native-born parents in subsidized CBC care exhibit increased behavior problems, relative to parental care, unsubsidized CBC care, and unsubsidized home-based care. As with cognitive outcomes, it could be that subsidized CBCs are lower in quality than the CBCs that unsubsidized children attend, with teachers who are not well trained to manage children's classroom behavior; it may also be that subsidized CBCs offer fewer opportunities for scaffolding and behavior management than does the one-on-one or small-group care provided in parental or home-based settings. Unsubsidized home-based care in particular, though not sufficiently stimulating to support cognitive development, may be quite supportive of behavioral development if the caregiver is a close relative or friend who proxies a parent, as unsubsidized home-based arrangements often do (Johnson et al., 2012).

As mentioned, because immigrants tend to underutilize ECE (including subsidized ECE), it is not surprising that when examining subsidies by care type among immigrants certain cells became quite small. This precluded our ability to account for the substantial heterogeneity among immigrants in factors such as country of origin and to apply more sophisticated statistical methods to address causal questions. To our knowledge, however, no other data source with information on a sizable subsample of low-income immigrant families, subsidy use, care type, and child outcomes exists. Even with potentially underpowered analyses, we detected statistically significant associations. Moreover, the overall pattern of results, wherein coefficients often reversed signs across subgroups, suggests that the effect of subsidies on school readiness may very well operate differently for children of immigrants than for children of native-born parents. Still, despite the inclusion of a range of covariates to address selection, additional work is needed to uncover causal mechanisms that explain these associations. And, our results for children of immigrants only generalize to those children who could be tested in English. Moreover, for those dual language learning children, results of cognitive testing in English may be less reliable than for their monolingual peers. Future national studies should seek to over sample immigrants and to collect data in children's native languages so that these analyses can be replicated on a larger sample with a broader array of immigrant-specific characteristics, using more rigorous statistical methods.

Despite these limitations, our results, if confirmed by future research, highlight areas in which subsidy policies might be redesigned to enhance the development of a particularly vulnerable and rapidly growing subgroup of children. Efforts to elevate the quality of home-based care should be a starting point: Immigrant families will continue to use informal home-based care because it is more culturally and linguistically similar to the family environment (Lowe & Weisner, 2004), because they are not familiar or comfortable with more formal programs in their areas (Liang, Fuller, & Singer, 2000), or because home-based care may better meet the needs of immigrant workers constrained by nontraditional or shift work schedules (Adams & McDaniel, 2009). Therefore, one policy solution is to connect informal providers who serve children of immigrants with technical assistance and professional development opportunities through local child-care resource and referral agencies. Subsidy caseworkers offer an entry point for linking these otherwise isolated child-care workers with a system that can support them and the children they serve.

At the same time, in light of positive associations between subsidized CBC care and reading among the immigrant subgroup, subsidy administrators might seek to expand the supply of CBC care in low-income immigrant communities, to encourage the hiring and retention of bilingual teachers and staff, and to increase CBC outreach and enrollment efforts. Subsidy quality improvement funds may also be directed to technical assistance initiatives designed to help improve the English skills of providers for whom English is a second language, to further elevate quality. Increasing the quality and availability of CBC care for subsidy recipients in immigrant communities, and attending to cultural continuity in CBCs, may be another way to enhance children of immigrants' readiness for school.

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