



School readiness gains made by ethnically diverse children in poverty attending center-based childcare and public school pre-kindergarten programs[☆]

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ABSTRACT

Although intensive early childhood interventions and high quality preschool programs have been shown to foster children's school readiness, little is known about the school readiness gains made by ethnically and linguistically diverse children in poverty receiving subsidies to attend center-based childcare or those in public school pre-kindergarten programs. Within the context of a large-scale, university–community applied research and evaluation project, The Miami School Readiness Project, children receiving subsidies to attend center-based childcare ($n = 1478$), children attending free Title 1 public school pre-k programs ($n = 1611$), and children attending fee-supported public school pre-k programs ($n = 749$) were individually assessed at the beginning and end of their pre-kindergarten year in the areas of cognitive, language, and fine motor development. Parents and teachers reported on children's socio-emotional strengths and behavior concerns. Findings revealed that although children from all types of programs made considerable school readiness gains in most areas in terms of their national relative standing, children attending public school pre-k programs typically made somewhat greater gains in the areas of cognitive and language development. Results suggest that center-based childcare programs in the community may be beneficial for fostering school readiness within ethnically diverse children in poverty, and that public school pre-kindergarten programs may show even greater gains in some areas. Policy implications are discussed.

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Research, public, and policy interest in early childhood education and children's transition to school is currently very strong. Such interest in early childhood is fueled by recent findings that children's preschool and childcare experiences are crucial for the development of important school readiness skills and later school outcomes (Bowman, Donovan, & Burns, 2001; Clarke-Stewart & Allhusen, 2005; NICHD ECCRN, 2005a; Shonkoff & Phillips, 2000), and that a successful transition to school buffers children's future academic and behavioral development (Kurdek & Sinclair, 2001; Pianta & Kraft-Sayre, 2003;

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Rimm-Kaufman, Pianta, & Cox, 2000). Further, early childhood intervention programs have been found to be successful in improving the developmental outcomes of children in poverty (Barnett, 1995; Campbell, Pungello, Miller-Johnson, Burchinal, & Ramey, 2001; Garces, Thomas, & Currie, 2002; Reynolds & Ou, 2003). It is also clear that accountability is important and programs need to demonstrate evidence of effectiveness in order to be funded (Camilli, Vargas, & Yurecko, 2003; Fitzgerald et al., 2002; Florida Partnership for School Readiness, 2003; White House, 2004). Such developments have stimulated interest by researchers, communities, and policy makers to evaluate large-scale, early childhood educational programs (Currie & Thomas, 2000; Gilliam & Zigler, 2004; Gormley, Gayer, Phillips, & Dawson, 2005; Love, Kisker, & Ross, 2005; Ramey et al., 2000).

Although all children are likely to benefit from high quality early childhood programs, much of the recent interest in early childhood policy and practice is motivated by a desire to help improve the school readiness and academic trajectories of children in poverty, who are at significant risk for early school drop out, poor academic performance and behavior problems in school, and lower levels of literacy attainment (August & Hakuta, 1997; Brooks-Gunn & Duncan, 1997; Entwisle & Alexander, 1993; Korenman, Miller, & Sjaastad, 1995; McLoyd, 1998; Wertheimer & Croan, 2003; Zill, 1999). In general, there are four types of early childhood programs/interventions or subsidized childcare services that low-income children participate in, whose potential for promoting school readiness has been studied to varying degrees: (1) individual, free-standing, well-funded, intensive, and comprehensive research-based initiatives that include high-quality educational services often coupled with other economic and social services, such as the Abercrombie Project (Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002), Project Hope (Reynolds, 1994), and the Infant Health and Development Project (McCarton, Brooks-Gunn, Wallace, & Bauer, 1997); (2) Head Start, a large-scale multi-dimensional intervention specifically targeted at impoverished populations (Abbott-Shim, Lambert, & McCarty, 2003; Currie & Thomas, 1995; Garces et al., 2002); (3) state-funded, public school pre-kindergarten programs (Gilliam & Zigler, 2004; Howes et al., 2008); and (4) community-based childcare settings.

Interventions in the first category have been studied in some detail and found to yield moderate to very impressive school readiness gains for low-income children, compared to similar children not participating in such programs (Campbell et al., 2002; McCarton et al., 1997; Reynolds, 1994). Positive effects of such programs are found not only in the academic and cognitive domains but also the areas of socio-emotional skills and adaptive behavior, with positive effects of intervention in some cases shown to last throughout adolescence (Brooks-Gunn, 2003; Campbell et al., 2002). Although such findings are critical in showing what *can* be done in the way of early intervention with small groups of children in a small number of sites with considerable funding and excellent research designs, from a practical, federal, or state policy perspective, evidence is still needed as to the effectiveness of larger-scale community programs for promoting the school readiness of children in poverty.

Head Start, a federally-funded program that provides preschool services as well as other child and family services to children in poverty, has also been found to be effective in promoting school readiness among poor preschoolers, improving not only early academic achievement but other social and behavioral outcomes as well (Abbott-Shim et al., 2003; Barnett & Hustedt, 2005; Currie & Thomas, 2000; Garces et al., 2002; ACF, 2005). However, Head Start only reaches about 800,000 3- to 4-year-old children, which is about 50% of eligible preschool-age children from low-income families (Children's Defense Fund, 2005). The majority of preschoolers in poverty in the United States attend childcare/preschool programs that we know much less about, namely state-funded pre-kindergarten programs or community-based childcare centers. The present study examines the school readiness gains during the pre-kindergarten year made by children attending these latter two types of early childhood programs.

1. Pre-kindergarten programs

State-funded pre-k programs, targeted at either all children in the form of universal pre-k or specifically for children in poverty, have been increasing in popularity as a way to narrow the school readiness gap and boost academic trajectories for poor children (Gormley et al., 2005; Howes et al., 2008; Pianta et al., 2005). As of 2002, 38 states have implemented such programs (Barnett, Hustedt, Robin, & Schulman, 2004; Gilliam & Zigler, 2004). State-funded pre-k programs typically (but not always) operate within the public school system and are designed to boost the cognitive, academic, and language skills of 4-year-olds during the year before they enter kindergarten (Howes et al., 2008; Pianta et al., 2005). About 14% of 4-year-olds in the US are in public school-based pre-k programs (U.S. Department of Education, National Center for Education Statistics, 2003). Although they vary considerably in quality, several common structural indicators suggest that public school pre-k programs on average provide reasonably high-quality care. Most pre-k programs meet or exceed the National Association for the Education of Young Children's (NAEYC) recommendations for class size and child-to-caregiver ratios (U.S. Department of Education, National Center for Education Statistics, 2003), and the majority (86%) of school-based teachers in pre-k programs have 4-year college degrees and earn salaries commensurate with that of elementary school teachers (Blau, 2001). Compared to typical childcare programs attended by low-income children, public school pre-k programs have been found to be of notably higher quality (Goodson & Moss, 1992; Phillips, Voran, Kisker, Howes, & Whitebook, 1994).

The limited research currently available on public school pre-k programs suggests that such programs do have significant and positive effects (i.e., *d*'s around .39) on children's cognitive and language development (Gormley et al., 2005). Using data from the Early Childhood Longitudinal Study—Kindergarten Cohort, Magnuson and her colleagues (Magnuson, Meyers, Ruhm, & Waldfogel, 2004; Magnuson, Ruhm, & Waldfogel, 2007) found that children who were enrolled in pre-k programs scored .19 of a standard deviation higher on assessments of reading and math skills at school entry than children exclusively in parental care the year before kindergarten. In addition, these authors found that although pre-k programs have beneficial effects on children's cognitive and academic skills, at least for the first year of elementary school, participation in such

programs can also have negative effects on children's problem behavior. Interestingly, the negative effects on children's behavior were found to exist only in private center-based pre-k programs and not for pre-k programs run through the public school system (Magnuson et al., 2007). However, effects on children's behavior have not been found in other studies (Gormley et al., 2005). Finally, notable gains (effect sizes of .16 to .68) in the areas of language, math, literacy, and social skills (but not behavior) were observed in the recent NCEdL Multi-Site Study of Pre-Kindergarten (Howes et al., 2008).

2. Subsidized childcare

The largest share of America's poorest 4-year-olds is served by programs that we know the least about from research, namely, community-based childcare programs that accept children with childcare subsidies. Approximately 1.8 million children used subsidized childcare funds during fiscal year 2005, typically in the form of federally provided State block grant funds to subsidize childcare costs for working low-income families and families on welfare receiving Temporary Assistance for Needy Families (Administration for Children and Families [ACF], 2006). The percentage of childcare subsidy-eligible families nationwide who are actually using subsidies has been estimated to be between 12 and 15% (Blau & Tekin, 2003). The reasons for the low utilization rates include, but are not limited to (a) states setting the eligibility criteria at a lower ceiling than the federal standards, and thus limiting the number of low-income families eligible for subsidies, (b) families applying for funds but being placed on long waiting lists, and (c) eligible families not applying for funds because of real and perceived barriers associated with the childcare subsidy system (Lowe & Weisner, 2001; Shlay, Weinraub, Harmon, & Tran, 2004). Moreover, families who participate in childcare subsidy programs often do so for short durations, with each use typically lasting between 3 and 7 months (although this varies from state to state (Weber & Davis, 2002). Childcare subsidies are intended to help low-income families afford childcare, access higher quality childcare, and maximize childcare choice. Families can choose state-registered childcare providers, who are required to meet all state licensing or regulatory requirements to receive federal assistance, but they can also use unregistered providers, who are not required to meet state licensing requirements. According to the latest national estimates, 59% of subsidized children are in center care, 29% are in family day care, 8% are cared for in the child's home, and 4% are in group home care (ACF, 2006).

There has been very little research on the extent to which subsidized childcare programs prepare children in poverty for the transition to school. Several demonstration programs involving the provision of subsidized childcare have been evaluated with regard to multiple and varied goals. Findings have been mixed, with some showing improved study skills, academic performance, social competence, and behavior among boys (but not girls) compared to controls (Bos et al., 1999) and others showing no effects on child outcomes (Kisker, Rangarajan, & Boller, 1998; Shlay et al., 2002). However, it should be noted that such demonstration programs have implemented childcare services in combination with many other social, economic, and family programs and services making it difficult to isolate the effects of childcare alone.

Research on the effects of childcare on children's academic, social, and school readiness suggests that attendance in a high-quality, center-based childcare program promotes cognitive, language, academic, and literacy development (Burchinal, Peisner-Feinberg, Bryant, & Clifford, 2000; NICHD ECCRN, 2003; Peisner-Feinberg et al., 2001). Further, such effects are found to be moderated by children's SES, with children in poverty most likely to benefit academically from high-quality childcare programs compared to children from more economically advantaged families (Loeb, Fuller, Kagan, & Carrol, 2004; NICHD ECCRN, 2005b; Votruba-Drzal, Coley, & Chase-Lansdale, 2004). However, not all studies have found preschool quality and program effects to be larger among low-income children compared to their higher-income counterparts (Burchinal, Peisner-Feinberg, et al., 2000; Burchinal, Roberts, et al., 2000).

The quality of center-based childcare in the U.S. varies widely with the average quality of center-based childcare being mediocre (Dickinson & Sprague, 2001; Helburn, 1995). Access to high quality center care varies by income status but not necessarily in a linear manner. High-income families have the economic means to purchase quality center care and low-income families qualify for childcare assistance subsidies, which presumably help them purchase center care of somewhat higher quality. Working-poor families, who neither qualify for financial assistance for childcare nor have great financial flexibility, are more likely to use lower quality center-based childcare (Fuller, Holloway, & Liang, 1996; Phillips et al., 1994). It is unclear the extent to which attendance at poor- to average-quality childcare centers is beneficial for poor and near-poor children's school readiness. Most of the childcare research to date, including the large, multi-site studies, has been conducted on fairly advantaged samples (Clarke-Stewart & Allhusen, 2005; NICHD ECCRN, 2005a). Given that early childhood care and education programs are often primary mechanisms in policy strategies to help narrow the school readiness gap between the low-income and the affluent (Haskins & Rouse, 2005; Magnuson & Waldfogel, 2005; Rouse, Brooks-Gunn, & McLanahan, 2005), additional research is needed within existing community-based childcare centers to see whether such everyday programs are fostering school readiness in our nation's most vulnerable families receiving childcare subsidies.

Finally, given that in the United States ethnic and linguistic minorities are over-represented among families living in poverty (August & Hakuta, 1997; Timberlake, 2003), any investigation of the effects of subsidized childcare on low-income families needs to explore issues of language and culture. In addition to income serving as a moderator of the effects of childcare on children (Votruba-Drzal et al., 2004), ethnicity can also moderate childcare and pre-k program effects, even when SES is controlled (Gormley et al., 2005; NICHD ECCRN, 2003). Although some researchers have found positive effects of attending high quality childcare programs to be independent of children's race/ethnicity (Burchinal, Peisner-Feinberg, et al., 2000), others have found ethnicity to moderate child gains. For example, non-Hispanic Caucasian children have been found to make greater gains in Head Start compared to Black youngsters (Currie & Thomas, 1995), and Black and Latino

children showed more benefits from attending some universal pre-k programs than their White peers (Gormley et al., 2005). These findings suggest that program effects for children varying as a function of ethnicity need further investigation and that studies exploring such issues within minority communities is clearly needed.

Unfortunately, much of what we know from the research on early childcare and on children's transition to school is based on predominantly Caucasian, middle class samples of children and families, which has led numerous researchers to call for more childcare research (and child development research in general) to be conducted specifically within ethnic minority communities (Brooks-Gunn, 2003; Coll, Crnic, Lamberty, & Wasik, 1996; Johnson et al., 2003). Existing large-sample studies of childcare or pre-k programs are either fairly limited in the diversity of their sample in the first place (e.g., NICHD ECCRN, 2005a) or have chosen to limit their analyses to rather homogenous groups of English-speaking children (Howes et al., 2008). Nationally representative samples are not only difficult and expensive to obtain but they are not necessarily the best way to glean sufficient data for answering questions about developmental processes within specific minority populations. Increasingly, researchers are recommending that focused large-sample studies within specific ethnically and linguistically diverse communities be obtained (Coll et al., 1996; Johnson et al., 2003).

The present study investigates school readiness gains over time made by ethnically diverse, urban children in poverty receiving different types of childcare services during their pre-kindergarten year. Children from low-income families who qualify for and receive childcare subsidies to attend regular, center-based childcare programs in the community were studied ($n = 1478$) in addition to similarly low-income children who attend Title 1 pre-kindergarten programs within the public schools ($n = 1611$). Also included for comparison purposes is a group of children within the same community with sufficient resources to pay their own way to attend public school pre-kindergarten programs ($n = 749$). Consistent with contemporary emphases on both the cognitive/academic and the socio-emotional and behavioral aspects of school readiness (Denham, 2006; Raver, 2002; Snow, 2006), multiple areas of child functioning were assessed at the beginning and end of the pre-kindergarten school year, including children's cognitive, language, fine motor, socio-emotional skills, and behavior problems. This paper represents the first work to emerge from the Miami School Readiness Project, a large-scale, university-community collaborative, multi-agency, applied school readiness project underway in Miami-Dade County, Florida. In this project, the school transition of essentially the entire population of (consenting) 4-year-old children receiving non-Head Start, subsidized childcare services and children attending public school pre-kindergarten programs in the county was studied in the context of program evaluation and childcare quality enhancement.

There are several features of Miami-Dade County that make it an ideal community to conduct research on ethnically and economically diverse children in early childhood programs. Miami-Dade is currently the 4th largest school district in the country serving approximately 80,000 children. Miami-Dade has a diverse population and our sample reflects this diversity (58% Hispanic/Latino, 33% Black/African American, and 9% Caucasian/other). Both English and Spanish are supported languages within the community. Consistent with contemporary approaches to assessment in multi-cultural communities (Bernstein, Harris, & Long, 2005), children in this study were assessed in either English or Spanish, and parents and teachers also completed assessments in either English or Spanish based on their choice. Miami-Dade also has an unfortunately large number of children in poverty, with 22.9% of children under the age of 18 living below the federal poverty level as of the year 2000 (U.S. Census Bureau, 2000). Finally, Miami is an important community to study from a policy perspective since considerable change is underway in the community with the recent implementation of a universal voluntary pre-k program in Florida (Florida House of Representatives, 2004), and local taxpayer support for early childhood programs and services (statute 125.901, F.S.; Florida Senate, 1988).

The following research questions were addressed in this study: (1) to what extent do ethnically and linguistically diverse, low-income children (a) receiving subsidies to attend garden variety, center-based childcare programs in the community, (b) attending Title 1 funded pre-k programs, and (c) attending fee-supported pre-k programs, make school readiness gains in their pre-kindergarten year in terms of relative standing compared to national norms? (2) To what extent are the school readiness gains observed in center-based childcare moderated by child gender and/or ethnicity? (3) How do children's gains from the beginning to the end of their pre-kindergarten year compare across these programs? (4) Are similar patterns of school readiness gains over time seen for low-income children assessed in Spanish compared to children assessed in English? Consistent with the methodological approaches recently adopted by both the NICHD ECCRN (2005b) and the NCES Early Childhood Longitudinal Study (Lee, Burkam, Ready, Honigman, & Meisels, 2006), the present study analyses within-child gain scores and relations among program type and children's cognitive, language, and socio-emotional skills using ANOVAs and mixed linear models (Singer & Willett, 2003) taking into account children being nested within centers/classrooms.

Although it is clear that children in poverty attending high quality center-based care would be expected to make considerable gains in school readiness over the course of the year (Loeb, Bridges, Bassok, Fuller, & Rumberger, 2005), it was less clear what to expect in the present study where the overall average quality of center-based care is likely to be mediocre as has been shown in other studies involving other Florida or other urban childcare centers (Cost, Quality, and Outcomes Study Team, 1995; Peisner-Feinberg & Burchinal, 1997). Low- to average-quality childcare could have no effect on children's developmental outcomes. On the other hand, to the extent that children in this impoverished urban environment are exposed to a great number of risk factors, even mediocre quality care could have buffering effects on children's intellectual and behavioral development (Votruba-Drzal et al., 2004). Given prior research showing public school pre-k programs to be effective in improving outcomes for low-income children, we expected children attending those programs to make considerable progress in most domains over the course of their fourth year and expected children in such programs at the end of the year to be better off than children in center-based care given the quality features present in the public school pre-k system. Given that

research has shown that poverty is a significant risk factor for poorer school readiness outcomes (Bradley & Corwyn, 2002; Brooks-Gunn and Duncan, 1997), we expected children attending fee-supported pre-k programs to start and finish the year at considerable advantage over the two groups of children in poverty.

In terms of moderators of gains, we expected that girls would consistently be at an advantage compared to boys in the areas of language and behavior, given well-known gender differences in early childhood (Bornstein, Hahn, & Haynes, 2004), but we saw no reason to expect differential gains over time between boys and girls. Given very strong sociolinguistic and socio-cultural support for Spanish language use in the Miami community, and the wide-spread availability of Spanish-speaking early childhood preschool teachers, we expected to see minimal differences in children's gains over time as a function of language of assessment. However, to the extent that very limited English skills by young children (leading to assessment being conducted in Spanish) may indicate the presence of increased risk factors such as recent immigration and lower parental education, lower initial and final skill levels were expected for those assessed in Spanish. In terms of ethnicity, it was unclear what to expect due to conflicting findings in the literature. Gormley and Gayer (2005) found that African-American and Hispanic children benefited more from full-day, universal pre-k than did Caucasian children. Thus, we expected to find the same pattern for at least the children attending public school pre-k programs here, but it was not clear what to expect for children in childcare settings within this unique multi-cultural community.

3. Method

3.1. Participants

Child participants for the current study consisted of 3838 (51% male) 4-year-old preschoolers attending either center-based childcare in the community via subsidies ($n = 1478$), Title 1 subsidized public school pre-kindergarten programs ($n = 1611$), or fee-supported public school pre-kindergarten programs ($n = 749$) during the 2003–2004 academic year. This is a sub-sample of a larger sample of children participating that year in the Miami School Readiness Project. The larger group reflects essentially the entire population (excluding the 3% who did not give consent and the 22% who were unreachable) of 4-year-old children in the county that year who were either attending a public school pre-kindergarten program or receiving childcare subsidies to attend some kind of (non-Head Start) childcare arrangement (center-based, family daycare, or informal care). The sample included here represents only those children who (a) attended center-based childcare (excluding children who attended family day care or informal care) or public school-based programs (Title 1 or fee-supported pre-k programs) for the entire school year (for both Time 1 [T1] and Time 2 [T2] assessment), and (b) had at least some repeated-measures child assessment data. Subsidy receipt (Temporary Assistance for Needy Families – TANF or Child Care and Development Block Grants – CCDBG) was determined by active eligibility and attendance status within the administering county agency's records as of 1 September of that year and children were only assessed if they were still active and eligible at time of assessment. Because Head Start programs were from a different funding source, with a different administrative structure, and they have their own child school readiness assessment procedures, children attending Head Start centers did not participate in the study. Table 1 describes the demographic data available on the children by type of program.

At T1, children were an average of 54 months of age, and age of child at assessment was the same across all three groups. Overall, the majority (58%) were Hispanic/Latino according to school records, with an additional 33% being Black/African-American (including those of Caribbean/Haitian origin), and 9% White non-Hispanic/Caucasian or "other." However, as seen in Table 1, Black children were more likely to be in Title 1 pre-k programs and less likely to be in a fee-supported program, and Caucasian children were slightly over represented in the fee-supported public school pre-k program, compared to the other programs. Children's strongest language, as measured by the language the child was assessed in (determined by informal teacher report and assessor determination at time of testing) was about 50/50 (English/Spanish) within the subsidized children attending center-based childcare. Within the public school system, child assessment was conducted more exclusively in English.

The additional demographic information that appears in Table 1 with respect to the public school programs was obtainable only from the 181 families who were originally participating in the subsidized childcare system in the previous year and subsequently transferred into a public school pre-k program by the time of this study. While the parents of child participants who remained in childcare were 65% Hispanic/Latino, and 32% Black, those who had switched early on to the pre-k program were 65% Black and 35% Latino. Similarly, the families that moved to the public school system for pre-k from childcare centers were more likely to speak English (64%) at their intake interview compared to those who remained in center-based care (42%).

The vast majority (92%) of families receiving center-based care were single/unmarried and those who eventually went on to public school pre-k were no different on this measure. Families receiving subsidized childcare funds were indeed of very low income and parents had relatively little education. These figures did not differ for those in the Title 1 pre-k program who had this information. Families who previously switched to the Title 1 public school pre-k system were slightly larger ($M = 3.7$ compared to those in center-based care, $M = 3.3$). Finally, although all were low income, both Caucasian and Latino families ($M = \$16,400$, $S.D. = \$8300$ and $M = \$16,700$, $S.D. = \$7200$, respectively) within the community care group had slightly higher mean annual incomes than Black families ($M = \$15,300$, $S.D. = \$7500$, $F [2, 1008] = 3.5$, $p < .05$). Although unfortunate that systematic SES information was not available for those in the public school pre-k programs, the income criteria for qualifying for Title 1 pre-k services and subsidized childcare in this community is basically the same, namely, family income below 150%

Table 1
Demographic characteristics of children in the child care programs

| | Subsidized child care center-based (n = 1478) | Subsidized Title I pre-K (n = 1611) | Fee-supported pre-K (n = 749) | F, t or χ^2 |
|---|---|-------------------------------------|-------------------------------|------------------|
| Child's age (in months) | | | | |
| M | 53.6 | 53.9 | 53.7 | 2.71 |
| S.D. | 3.5 | 3.5 | 3.5 | |
| Child's gender | | | | |
| % Male | 53.2 | 50.0 | 49.8 | 4.00 |
| Child's ethnicity | n = 1476 | n = 1569 | n = 713 | |
| % Caucasian | 7.0 | 2.7 | 27.1 | 575.74* |
| % Hispanic/Latino | 60.5 | 51.8 | 66.2 | |
| % Black/African-American | 32.5 | 45.4 | 6.7 | |
| Child's LAP-D assessment language | n = 1477 | n = 1328 | n = 664 | 709.84* |
| % English | 50.6 | 86.7 | 97.4 | |
| % Spanish | 49.4 | 13.3 | 2.6 | |
| Parent's ethnicity | n = 1010 | n = 181 ^a | | |
| % White | 3.9 | 0.6 | NA | 73.95* |
| % Hispanic/Latino | 64.7 | 34.8 | | |
| % Black/African American | 31.5 | 64.6 | | |
| Parent's primary language | n = 1011 | n = 181 ^a | | |
| % English | 41.6 | 64.1 | NA | 45.52* |
| % Spanish | 53.0 | 26.0 | | |
| % Creole | 5.3 | 9.9 | | |
| Marital status | n = 1006 | n = 181 ^a | | |
| % Married | 7.3 | 8.3 | NA | .24 |
| % Single, divorced or separated | 92.7 | 91.7 | | |
| Educational level | n = 1011 | n = 181 ^a | | |
| % Less than high school diploma/GED | 17.0 | 19.9 | NA | 1.91 |
| % High school diploma/GED | 79.1 | 77.9 | | |
| % Some college/vocational training or above | 3.9 | 2.2 | | |
| Family size | n = 1011 | n = 181 ^a | | |
| M | 3.3 | 3.7 | NA | 3.15* |
| S.D. | 1.1 | 1.4 | | |
| Annual household income | n = 1011 | n = 181 ^a | | |
| M | \$16,248 | \$15,862 | NA | .52 |
| S.D. | \$7362 | \$9599 | | |

^a Only those who previously received subsidies for community-based childcare before enrolling in public school pre-k and before data collection began.

* $p < .01$.

of the federal poverty line, suggesting that these two groups are similarly at risk economically. The only difference, it would appear, between those in the Title 1 public school pre-k system and those in subsidized center care is that Spanish-speaking Latinos are more likely to be in subsidized care, perhaps because of the availability of Spanish-speaking teachers/childcare workers.

3.1.1. Early childhood programs

The 424 center-based childcare programs attended by the children receiving subsidies reflect the full spectrum of childcare programs in the community including for-profit, non-profit, and faith-based preschool programs either licensed or license exempt that accept subsidized care children. Although indicators of center quality were not available at the child or center level for this study, it would appear from data available county-wide that quality of care varies considerably with the average care experienced being of mediocre- to fair-quality, which is consistent with reports from other urban communities (Burchinal, Roberts, et al., 2000; Gross et al., 2003). At the time, only about 8% of all licensed childcare programs in the county were accredited by NAEYC or APPLE, and average ECERS-R (Harms, Clifford, & Cryer, 1998) data available from a representative subset of 78 of these programs that were assessed in the context of another community program evaluation project at the beginning of the school year revealed an overall average ECERS score of 4.08 (scores falling within the 3–5 range on this scale indicate mediocre quality). Children attending center-based childcare were in care for an average length of time of 23 months (S.D. = 13.5), and on average, attending childcare full time ($M = 39.6$ h per week, S.D. = 2.4), although children may have moved in and out of eligibility for receipt of subsidized childcare funds over time.

Public-school pre-kindergarten programs in the county at the time were full day (6 h) programs, and they required that classes be staffed by a certified teacher and a part-time activity leader who has completed early childhood training for childcare workers, and have a maximum class size of 24, 4- and 5-year-old children. Similar to other state pre-k programs (Bryant et al., 2002), pre-k program teachers have the same credentials and receive the same pay scale as other public

school teachers. Public school pre-k programs in Miami-Dade use the High Scope curriculum supplemented with a literacy program/curriculum. Although process quality information was not available, several structural features of quality such as higher trained/certified teachers and the use of a standard curricula, suggest that the quality of care received by children in the public school pre-kindergarten programs is higher than that received by low-income children attending childcare centers/preschools in the community, which is consistent with previous research (Barnett, 1995; Gilliam & Zigler, 2000, 2004). Although some children who attended public school pre-k programs may have attended community-based childcare in after school care/programs, there was generally no overlap between the child's main pre-k placements during the day. The 23 children who switched programs during the year (were in childcare at T1 and pre-k at T2, or vice versa) were excluded from the analyses.

3.2. Measures

3.2.1. Cognitive, language, and fine motor skills

The Learning Accomplishment Profile-Diagnostic (LAP-D; Nehring, Nehring, Bruni, & Randolph, 1992) is a norm-referenced, standardized instrument that assesses children's cognitive, language, and fine and gross motor skills. The instrument was administered individually to children in a separate room of the child's school, both around the beginning of the academic year (T1: September–October) and at the end of the school year (T2: April–May). For children receiving subsidies in the participating childcare centers, LAP-Ds were administered by 82 educated (typically MA level social workers or educational/school psychologists) assessors who had completed extensive multi-day trainings on the instrument conducted by personnel from the local collaborating university and the publisher of the instrument. These bilingual assessors arrived early in the day at a center and escorted children individually into another room for the approximately hour-long assessment as long as the child was not currently eating lunch or taking a nap. The assessor chose the language to use for assessment after asking the teacher which was the child's strongest language. In cases where this was not clear, the assessor made the language choice after talking with the child and establishing which language was more comfortable for the child. The LAP-Ds for children attending public school pre-k programs were administered by children's classroom teachers, who also completed the same training program.

The LAP-D was selected by the participating community's multi-agency, early childhood assessment task force on the basis that (a) it corresponds well with the State's Early Learning Performance Standards (Florida Partnership for School Readiness, 2003), (b) it is a nationally standardized, norm-referenced instrument yet was designed with curriculum-based, authentic program assessment in mind (Nehring et al., 1992), (c) it is available in both English and Spanish, (d) it assesses the dimensions of interest to the community (cognitive, language, and motor skills), (e) technology was available for assisting with large-scale, electronic administration and reporting, and (f) it has been shown to have good internal consistency reliability within the norming sample (alphas of .76–.92) and good content validity and construct validity (correlations between the subscales of the LAP-D and the relevant subscales of the Battelle Developmental Inventory (Newborg, Stock, Wnek, Guidubaldi, & Svinicki, 1984) ranged from .64 to .86, and the subscales of the Developmental Indicators for the Assessment of Learning – Revised (Mardell-Czudnowski & Goldenberg, 1983) ranged from .55 to .87, and the subscales of the Wechsler Preschool and Primary Scale of Intelligence – Revised (Wechsler, 1989) ranged from .43 to .89).

The LAP-D yields scale scores in four domains with two sub-scale scores: cognitive (matching and counting), language (comprehension and naming), fine motor (writing and manipulation), and gross motor (body and object movement—*not used here*). For the current study, age-standardized national percentile domain scores (cognitive, language, and fine motor) were used in analyses. Internal consistency reliabilities for the LAP-D with the present Miami sample was .93 for the cognitive scale, .95 for language, and .94 for fine motor.

3.2.2. Socio-emotional protective factors and behavior

Children's social-emotional strengths and behavior problems were measured (same T1 and T2 time periods discussed above) with parent- and teacher-report using the Devereux Early Childhood Assessment (DECA; LeBuffe & Naglieri, 1999). The DECA was designed to create a profile of children's social-emotional strengths or "protective factors" within a resilience framework (Werner & Smith, 1992). Teachers and parents separately report (identical forms) on the frequency of children's behavior by rating them on items comprising four sub-scales: initiative, self-control, attachment/closeness with adults, and behavioral concerns. Raters use a 5-point Likert-type scale to indicate how often within the past 4 weeks a child has exhibited behaviors described by the assessment items (0 = never, 1 = rarely, 2 = occasionally, 3 = frequently, and 4 = very frequently). Example items for the initiative subscale are "choose to do a task that was challenging for her/him" and "start or organize play with other children." For the self-control subscale, example items include "listen to or respect others," "control her/his anger," and "handle frustration well." Example attachment subscale items include "respond positively to adult comforting when upset" and "act happy or excited when parent/guardian returned." The behavior concern scale includes items such as "fight with other children" and "have temper tantrums." The first three subscales are combined to create an overall socio-emotional total protective factors score (bigger numbers indicating greater strengths) and the behavior concerns scale is scored such that larger numbers indicate greater problems with behavior. These are the two scales used here in the analyses in the form of standardized national percentiles. The DECA does not have separate age norms.

Parents received the forms in either English or Spanish (based on teacher knowledge of parental language or on direct parent preference when asked) upon picking up the child from the center and were asked to return the completed forms back

Table 2

Child Assessment scores of children receiving subsidies to attend center-based childcare and participating in public pre-kindergarten programs

| Measure | Program type | M (S.D.) | | F (Time) | Effect size ^a |
|---------------------------------|---------------|---------------|---------------|----------|--------------------------|
| | | T1 | T2 | | |
| LAP-D^{b,c} | | | | | |
| Cognitive | Center | 40.78 (28.24) | 49.93 (27.34) | 51.40* | .33 |
| | Title 1 | 47.24 (28.78) | 62.88 (27.65) | 123.44* | .55 |
| | Fee-supported | 57.57 (29.77) | 70.84 (26.68) | 102.44* | .42 |
| Language | Center | 32.68 (26.21) | 46.70 (28.02) | 95.31* | .52 |
| | Title 1 | 37.93 (27.36) | 56.29 (29.48) | 163.97* | .64 |
| | Fee-Supported | 53.98 (30.50) | 68.62 (27.78) | 120.21* | .55 |
| Fine motor | Center | 43.30 (29.30) | 52.35 (27.67) | 40.67* | .32 |
| | Title 1 | 50.89 (30.11) | 61.84 (28.10) | 58.80* | .38 |
| | Fee-Supported | 58.80 (28.45) | 67.58 (24.64) | 51.11* | .33 |
| DECA-Teacher^d | | | | | |
| Total protective factors | Center | 50.05 (27.62) | 57.30 (28.53) | 43.31* | .26 |
| | Title 1 | 49.91 (28.31) | 61.36 (28.49) | 88.25* | .40 |
| | Fee-Supported | 59.61 (25.85) | 70.46 (23.68) | 64.94* | .40 |
| Behavior concerns | Center | 53.99 (28.02) | 55.17 (28.22) | 1.77 | .04 |
| | Title 1 | 43.37 (28.59) | 44.08 (29.26) | 0.83 | .02 |
| | Fee-Supported | 37.54 (27.39) | 35.67 (26.49) | 2.02 | .07 |
| DECA-Parent^e | | | | | |
| Total protective factors | Center | 44.27 (30.82) | 51.10 (30.41) | 21.87* | .22 |
| | Title 1 | 44.91 (30.63) | 52.84 (30.73) | 16.65* | .26 |
| | Fee-Supported | 53.08 (28.76) | 61.68 (28.26) | 24.07* | .30 |
| Behavior concerns | Center | 71.55 (28.84) | 71.67 (27.59) | 0.01 | .00 |
| | Title 1 | 66.19 (29.07) | 68.72 (27.40) | 1.12 | .09 |
| | Fee-Supported | 64.48 (27.97) | 61.99 (27.97) | 1.88 | .09 |

^a $t_r\{[(1-r)/n_1] + [(1-r)/n_2]\}^5$ (Cortina & Nouri, 2000).

^b LAP-D scores from children who were assessed on the LAP-D measure in English at T1 and T2.

^c Center $N = 640$; Title 1 $N = 810$; fee-supported $N = 533$.

^d Center $N = 879$; Title 1 $N = 1389$; fee-supported $N = 621$.

^e Center $N = 587$; Title 1 $N = 1070$; fee-supported $N = 534$.

* Time effect in RM ANOVA significant $p < .001$.

with their child. Teachers (lead teacher in the case of multiple teachers) completed the forms on their own time. Teachers also had the choice of completing the English or Spanish form. Nineteen percent of the teachers and 37% of the parents completed the Spanish form at T1 (16% and 34%, respectively for T2).

During national standardization, the DECA was reported to have internal consistency reliability alphas of .94 (teacher) and .91 (parent) for total protective factors and .80 (teacher) and .71 (parent) for behavior concerns, and 1–3 day test–retest reliabilities of .94 (teacher) and .74 (parent) for protective factors and .68 (teacher) and .55 (parent) for behavior concerns (LeBuffe & Naglieri, 1999). Further, the authors report criterion-related validity in that DECA scores reliably distinguish children with known emotional and behavioral problems from normally developing children. Internal consistency reliability within this diverse sample was .91 (parent reports) and .94 (teacher reports) for total protective factors, and .72 (parent reports) and .81 (teacher reports) for behavior concerns. Reliability did not vary significantly as a function of language of form (Spanish, English) or rater.

4. Results

4.1. T1–T2 gains within program type

The first research question and main goal of the study was to learn the extent to which ethnically and linguistically diverse, low-income children (a) receiving subsidies to attend center-based childcare programs, (b) attending Title 1 funded pre-k programs, and (c) attending fee-supported pre-k programs make school readiness gains in their pre-kindergarten year in terms of relative standing compared to national norms. As a preliminary descriptive approach, in Table 2, we first report children's T1 and T2 scores on all of the measures separately within program type, along with the univariate main effects for time and corresponding effect size for time.¹ Repeated measures MANOVAs were conducted with time as the repeated

¹ Effect size, d , was calculated using the following formula which is recommended for repeated measures designs: $t_r\{[(1-r)/n_1] + [(1-r)/n_2]\}^5$ where r is the correlation between the measures at PRE and POST and n_i is the sample size for the measure at PRE and POST (Cortina & Nouri, 2000).

measure, first with the three LAP-D measures, then with the two teacher DECA measures, and finally with the two parent DECA variables included as dependent measures.² For the LAP-D scores, analyses (and table) are limited to only those children assessed in English (Spanish assessment results are presented below). Because of the ease of rejecting null hypotheses with the large sample sizes that are present here, $p < .001$ and an effect size greater than .1 was the cut-off used for determining whether an effect was worth discussing.

4.2. Center-based care

As seen in the table, low-income children receiving subsidies to attend center-based care in the community made significant T1–T2 gains in almost all areas (multivariate time effect for LAP-D $F [3, 632] = 39.67, p < .001$; Teacher DECA, $F [2, 872] = 27.16, p < .001$; Parent DECA $F [2, 580] = 10.92, p < .001$). In the area of cognition, children in center-based care not only made considerable positive gains in their raw scores (not reported) but also gained ground nationally compared to other children their age as they started the year at about the 40th percentile and reached national averages by the end of the pre-kindergarten year. In the area of language skill, this sample's weakest area, children started the year around the 33rd percentile and ended the year at the 47th percentile. In fine motor development, children also made good gains, passing the 50th percentile mark by the end of the year. On these measures, effect sizes were moderate (.32 to .52).

Both teachers and parents reported modest gains (d 's around .24) in children's socio-emotional protective factors over the course of the year. However, neither informant observed change in children's behavior concerns over the course of the year. It is perhaps worth pointing out that with this sample, teachers reported greater socio-emotional strengths (starting the year at the 50th percentile) and fewer behavior problems (54th percentile) for the children than did parents (44th and 71st percentile, respectively), who have considerable concerns about the preschooler's behavior. In summary, it would appear that low-income children attending center-based care in the community generally start off below national norms and make impressive school readiness gains during their pre-kindergarten year.

4.3. Title 1 public school pre-K

Also, as seen in Table 2, low-income children in Title 1 public school pre-k programs made considerable gains in all of the same domains seen in the center-based childcare group (multivariate time effect for LAP-D $F [3, 802] = 80.15, p < .001$; Teacher DECA $F [2, 1382] = 62.52, p < .001$; Parent DECA $F [2, 1063] = 9.10, p < .001$). Children attending Title 1 pre-k programs within the public schools typically started the school year below national averages on the measures (37–50th percentile) and made strong gains in all areas, climbing to as high as the 63rd percentile. No change over time was observed for parent- or teacher-reported behavior problems.

4.4. Fee-supported public school pre-K

The third program listed in Table 2 includes children who pay their own way in fee-supported public school pre-k programs. As to be expected given that the risk factor of poverty is not present for children in fee-supported pre-k programs, these children started and ended the year at higher levels than the other groups on most measures. Children in these programs also made substantial gains over time in the area of cognitive, language, and motor skills, and in socio-emotional strengths (multivariate time effect for LAP-D $F [3, 525] = 70.41, p < .001$; Teacher DECA $F [2, 614] = 33.19, p < .001$; Parent DECA $F [2, 527] = 12.43, p < .001$). Behavior problems remained stable from the beginning to the end of the year.

4.5. Main effects for gender and ethnicity

Similar MANOVAs including gender as an independent variable and including all children regardless of program, were conducted to examine the main effect of gender on children's skill levels, regardless of time. (Gender as a potential moderator of change over time analyses is discussed in the next section.) Of interest here was the finding that girls consistently outperformed boys on all areas/variables (d effect sizes range from .17 (cognitive) to .40 (teacher-reported behavior concerns)).

Main effects for ethnicity, averaging across time, were only examined in the context of children attending center-based care because of the need to control for family income in such analyses and such data were only available for children in childcare centers. ANCOVAs controlling for family income were conducted on all measures. The only between-subject ethnic difference found to be consistent over time that surpassed our preset level of statistical/practical significance was that Caucasian and Hispanic/Latino children in center care had somewhat higher fine motor skills at T1 and T2 than Black children, $F (2, 634) = 7.82, p < .001$.

² Mixed models, accounting for how children were nested within centers, with the post–pre change scores as the dependent measures were also conducted to test whether the size of the change intercepts were significantly different from zero. Results in all cases were the same as the repeated measures ANOVAs, which are reported here with the original pre and post means for simplicity.

Table 3
Model results and parameter estimates from mixed models comparing child gain scores (percentiles) by program type

| Measure | Estimate | S.E. | t (d.f.) | F (d.f.) |
|---|----------|------|--------------|--------------|
| LAP-D | | | | |
| Cognitive | | | | |
| Center-based care vs. Title 1 public school (PS) | −6.18 | 1.40 | −4.42 (276)* | 9.91 (2192)* |
| Fee-supported Public School (PS) vs. Title 1 public school (PS) | −2.40 | 1.70 | −1.42 (136) | |
| Language | | | | |
| Center-based care vs. Title 1 PS | −4.44 | 1.50 | −2.96 (253)* | 4.64 (2185)* |
| Fee-supported PS vs. Title 1 PS | −3.59 | 1.88 | −1.91 (137) | |
| Fine motor | | | | |
| Center-based care vs. Title 1 PS | −2.03 | 1.39 | −1.46 (251) | 1.30 (2181) |
| Fee-supported PS vs. Title 1 PS | −2.15 | 1.72 | −1.25 (132) | |
| DECA-Teacher | | | | |
| Total protective factors | | | | |
| Center-based care vs. Title 1 PS | −2.00 | 1.60 | −1.25 (246) | 1.09 (2196) |
| Fee-supported PS vs. Title 1 PS | −2.71 | 2.22 | −1.22 (153) | |
| Behavior concerns | | | | |
| Center-based care vs. Title 1 PS | .30 | 1.45 | .21 (233) | .90 (2154) |
| Fee-supported PS vs. Title 1 PS | −2.23 | 1.97 | −1.13 (134) | |
| DECA-Parent | | | | |
| Total protective factors | | | | |
| Center-based care vs. Title 1 PS | −.70 | 1.40 | −.50 (308) | .48 (2158) |
| Fee-supported PS vs. Title 1 PS | .94 | 1.53 | .62 (91) | |
| Behavior concerns | | | | |
| Center-based care vs. Title 1 PS | −2.89 | 1.35 | −2.14 (321) | 7.04 (2154)* |
| Fee-supported PS vs. Title 1 PS | −5.22 | 1.44 | −3.63 (84)* | |

4.6. Comparing gains across program types

The second question asks how gains in outcomes from the beginning to the end of the school year compare across the three program types. Mixed linear models were specified in which program type (center-based childcare, Title 1 and fee-supported pre-k programs) was used to predict children's standardized change scores (difference between end and beginning of the year scores), taking into account the fact that children were nested within centers/schools. Mixed linear models were performed using SPSS's mixed procedure. Program type was coded in such a way to easily make two types of comparisons: (1) center-based programs vs. Title 1 pre-k programs (the two different programs serving similarly low-income children) and (2) Title 1 vs. fee-supported pre-k programs (the two similar public school programs but with different children economically). The results of these analyses are shown in Table 3.

Although good gains were made in all programs, there were significant differences across programs in how much children gained over the year in the areas of cognitive and language development and in parent-reported behavior concerns. Low-income children in Title 1 public school pre-k programs showed greater gains over the year than children in community-based childcare in the areas of cognitive skills and language skills. The Cohen's *D* effect size for the difference in cognitive gain scores across these two programs was .23 and the effect size for the difference in language gains was .15. Fig. 1 plots this effect as an example for the case of cognitive skills. There was one difference pertaining to the two public school programs. While the low-income children in Title 1 programs increased slightly in their behavioral concerns from the beginning to the end of the year according to parent report, parents of children in fee-supported programs with more economic means reported a slight decrease in behavior problems across the year (effect size for the differences in gains was .18).

4.7. Gender/ethnicity and change over time

The third research question asked if school readiness gains were moderated by child gender and/or ethnicity. To answer this question, gender and ethnicity were also included as independent variables in the above-reported mixed linear models. In no case did gains vary by child gender or ethnicity. It would appear that all groups of children are likely to make progress relative to national norms while attending these early childhood programs.

4.8. Children assessed on the LAP-D in Spanish

The analyses above, when they pertained to cognitive, language, and fine motor skills, were limited to those children assessed in English. The final research question explored school readiness gains over time seen for the children in center-based care who were assessed in Spanish (because it was seen as the child's stronger language) on the LAP-D. Table 4 lists the

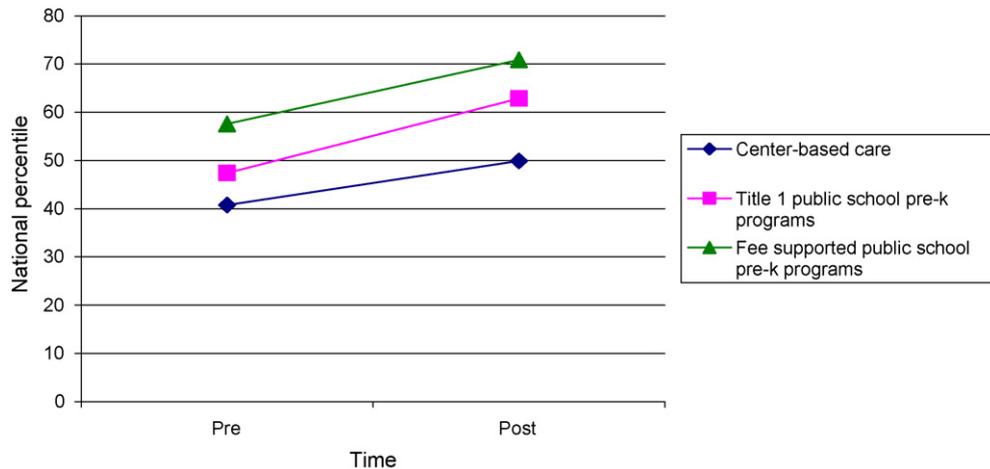


Fig. 1. Pre–post gains on cognitive skills by program type.

Table 4

LAP-D scores of Spanish-assessed subsidized children in center care

| LAP-D domain ^a | M (S.D.) | | F (Time) | Effect size |
|---------------------------|---------------|---------------|----------|-------------|
| | T1 | T2 | | |
| Cognitive | 34.74 (24.74) | 39.86 (25.17) | 0.36+ | .21 |
| Language | 23.29 (20.71) | 35.60 (25.99) | 23.37* | .52 |
| Fine motor | 44.02 (28.40) | 53.34 (26.60) | 9.11* | .34 |

(+) ns, but the effect was statistically significant with nested mixed linear models.

^a N = 536 children who were assessed on the LAP-D in Spanish at T1 and T2.

* Time effect in RM ANOVA significant $p < .01$.

T1 and T2 scores on the LAP-D for the 536 predominantly Spanish-speaking children attending community-based childcare. Children assessed in Spanish also made significant gains in all three areas over the course of the year. As before, the repeated measures ANOVA results reported in Table 4 were also replicated with mixed linear models that were conducted on these data to correct the standard errors given that children were nested within centers. All gains were statistically significant in the mixed models, even the cognitive percentile scores, which did not reach statistical significance with the repeated measure ANOVA approach. Finally, a repeated-measures MANOVA with language of assessment (English, Spanish) as a between-subjects factor for just Latino (excluding Caucasians and Blacks) center-based children yielded a language main effect, $F [3, 849] = 9.74, p < .001$, but no language-by-time interaction, $F [3, 849] = 1.84, p = .14$. Follow-up univariate repeated-measures ANOVAs revealed that Latino children assessed in English started and ended the year higher on measures of cognitive ($F [1, 851] = 19.46, p < .001$), and language ($F [1, 851] = 24.04, p < .001$) than children assessed in Spanish.

5. Discussion

The goal of this study was to determine the extent to which ethnically and linguistically diverse children in poverty attending a variety of center-based community childcare and public school pre-kindergarten programs are making gains in multiple areas of school readiness during their 4-year-old pre-kindergarten year. Current policy initiatives emphasize the potential that universal preschool and pre-kindergarten programs have to assist in preparing vulnerable children in poverty for school (Barnett et al., 2004; Gilliam & Zigler, 2004), however, additional data are needed to examine the extent to which children receiving childcare subsidies attending run-of-the-mill, center-based childcare programs in urban community settings are making school readiness gains. The present study contributes to the literature by examining a large and understudied, diverse population of low-income children attending early childhood programs that are also relatively understudied, namely community-based childcare, and public school pre-k programs, within a single multi-cultural community.

Results of this study show that ethnically diverse, 4-year-old children in poverty attending community-based childcare programs with subsidies indeed start their pre-kindergarten year at significant risk (32nd to 43rd percentile ranking) compared to national norms in the areas of language, cognition, and fine motor skills. However, such children make notable gains in these domains over the course of the year in such programs, such that by the end of the year, they are performing on average at or around the national average (47th to 52nd percentile). In terms of socio-emotional strengths and behavioral concerns, this group of children starts off around the national average and makes sizable improvements (around seven national percentile points) in teacher- and parent-reported social-emotional skills. Behavior problems are reported to be

relatively stable over the pre-k year according to both parents and teachers, with teachers reporting that children's behavior is typical of that seen in other 4-year-olds nationally.

Although unfortunate that it was not possible, within this applied community-based project, to secure a control group of matched children not attending any childcare or preschool program to which to compare these figures, it is still a notable and important finding for both research and practice that low-income, diverse children receiving subsidized childcare in this multi-cultural community are making good gains relative to national norms in multiple school readiness domains. It is important to note that such gains in terms of national percentiles are in no way guaranteed or to be taken for granted. It is not uncommon to find young children living in high-poverty, urban environments falling behind with respect to other children and national standards as they progress toward and through grade school (Brooks-Gunn and Duncan, 1997; NICHD ECCRN, 2005b). Children who fall behind their peers early on not only experience academic difficulty at school entry, but also because they lack basic requisite school readiness skills when they enter school, they often fall further behind their peers on a number of school skills throughout grade school. Thus, it is vitally important that children in poverty keep up early on so that they do not fall behind other children during the school years, and center-based childcare and public school pre-k programs appear to be helping.

Also examined in the present work is the progress made by similarly low-income children who attend public school pre-kindergarten programs subsidized by Title 1. Public school pre-k programs in this community have a number of important structural features (certified programs, higher paid and more educated teachers, certified teaching assistants, and use of a standard curriculum) which suggests, although does not guarantee, that such pre-k programs provide higher quality care than that received by children in center-based community childcare. Thus, as expected, low-income children attending Title 1 pre-k programs also made considerable gains from the beginning to the end of their pre-kindergarten year in all domains of readiness except behavior problems, however, this group of children started off and finished the year at a slight advantage and had steeper gains over time in language and cognitive skills compared to children in center-based childcare. The fact children in Title 1 pre-k programs scored slightly higher at T1 compared to children in center care is likely due to the fact that "pre" assessments took place (September–October) some time after the school year had actually started (August) so there was time for the pre-k curriculum to have already shown an effect at T1.

It would appear that although children in all types of programs make sizable gains in their pre-kindergarten year, low-income children may benefit slightly more in language and cognition from public school pre-k programs, in which specific curricula geared toward these skills are more likely to be found, than in center-based childcare. It is important to note, however, that without the availability of relevant demographic data, we were not able to control for family selection factors that could differentiate between families that choose center-based care and families that choose to enter the public school pre-k system. Although qualification criteria for both kinds of public assistance for childcare are the same (family income below 150% of the federal poverty line), suggesting that subsidized center-based care and Title 1 pre-k families were similarly low-income, this could not be directly tested and there could have been other differences between the families participating in these two early childhood programs. It is worth noting here, however, that although family characteristics are likely to affect individual differences in overall levels of abilities at one time point, family factors have not been found to differentially predict change over time in large-scale studies (Burchinal, Roberts, et al., 2000; NICHD ECCRN, 1998), thereby increasing our confidence that the results pertaining to gains found here are not invalidated by potentially uncontrolled selection effects.

It is important to point out with respect to the effect of childcare on language growth, that children in all types of programs were found to make impressive gains in both English and Spanish language development. Children assessed in English showed considerable (English) language growth over time, and children who were predominantly Spanish speaking also showed gains in cognition and language when assessed in Spanish. This suggests that at least within a community such as Miami with strong sociolinguistic support for Spanish language use and widespread availability of Spanish-speaking caregivers, Spanish-speaking children's language and cognitive development are stimulated sufficiently in childcare settings to observe school readiness gains in these and other domains. Such data are novel and valuable within the field given that other large-scale studies of pre-kindergarten and childcare typically either do not have or do not report on language-minority children or assessment results for Spanish-speaking children (NICHD ECCRN, 2005a; Howes et al., 2008). Additional follow-up studies are planned to examine the progress that each of these language (and school type) groups makes as they progress through early elementary school.

One potential policy implication of the study findings is that policies perhaps should be designed to increase enrollment in center-based childcare programs and public school pre-kindergarten programs because it appears that their goal of increasing the school readiness of children is being realized. Recent estimates suggest that only 12–15% of childcare subsidy eligible children are utilizing subsidies (Blau & Tekin, 2003) and about 14% of 4-year-old preschoolers are utilizing public school-based pre-k programs (U.S. Dept of Education, NCES, 2003). Thus, there are a sizable number of children, many who are eligible, who are not participating in these early childhood programs. The results of the study suggest that such low-income children may benefit from such programs and that efforts could be made to increase enrollment of children into these programs. However, it is possible, due to potential selection differences between those who choose to attend programs such as subsidized childcare and public school pre-k, and those that do not, that the same benefits seen here might not generalize to currently non-attending children should they begin to enroll in such programs.

The results of the present study are interesting from a policy perspective in terms of the question of how much quality matters in early childhood programs. On the one hand, the finding that children in poverty attending public school pre-k programs show greater gains in language and cognition in their pre-kindergarten year than those attending center-based childcare in

the community suggests that quality matters. The public school programs have better paid, and generally more educated and trained teachers than those in community-based childcare centers, and they systematically use developmentally appropriate curricula. These are important structural features of quality in early childhood programs which could account for the increased gains observed in the pre-k programs (although uncontrolled selection factors in this study cannot be ruled out). This would suggest that we need to invest in increasing the quality of early childhood programs, a common suggestion from previous research and indeed a worthy goal (Loeb et al., 2005; Vandell & Wolfe, 2002). On the other hand, the results from the present study also show that children in poverty attending garden-variety, center-based childcare of likely only mediocre quality are showing impressive gains toward school readiness. This perhaps suggests that just getting low-income children into center-based childcare is helpful for enhancing their school readiness and the extra expenditure to ensure the ultra high quality of the childcare center might not be needed to achieve at least some results. It would appear, and is certainly possible and not mutually exclusive, that both are true—that center-based childcare is useful for increasing the school readiness of low-income, predominantly Latino and African-American preschoolers in Miami and that added benefits are seen in language and cognition for children attending higher-quality, public school pre-k programs that emphasize those areas.

Although the present study is strengthened in terms of ecological validity by its applied, to-scale, community-based focus, working in cooperation with existing agencies providing early childhood programs and services within one community on a large scale (Denner, Cooper, Lopez, & Dunbar, 1999; Lerner, Fisher & Weinberg, 2000; McCall & Groark, 2000), there are, of course, fewer opportunities for experimental control and methodological rigor for research conducted within such a context. Thus, there are a number of methodological limitations of the present research that are important to keep in mind when interpreting the results. First of all, we were not able to collect the relevant demographic information of children participating in the public school pre-k programs to sufficiently control for selection factors when comparing across early childhood programs. Income qualification criteria, however, are similar for Title 1 and community childcare subsidy programs. Even if there were large uncontrolled differences in the participants across the programs, it would not invalidate the central findings that children are making school readiness gains within each of the programs.

Second, since the pre-k teachers themselves administered the LAP-D assessments to the children in the public schools pre-k programs, it is possible that child assessment gains were overestimated if teachers felt the need to show child improvements in the current climate of high stakes testing and educational accountability (Jost, 2001). Having the teachers themselves administer the assessment is, of course, best practice in terms of the central practical goal of early childhood assessments relating to and informing classroom instruction (William, 2006), and such practice is standard in large-scale child assessment programs such as those used in Head Start and in state-supported universal pre-k programs. This feature could also be seen as a strength, however, because clearly research is needed on real-world, community-based, large-scale assessment initiatives such as this one in Miami where the teachers are involved in the child assessments as this is the reality for state-supported, early childhood programs. Applied research on assessment programs such as this needs to be conducted so we understand what child assessment results look like in such real-world settings (Denner et al., 1999). The fact that similar patterns of change were found for the children receiving community-based childcare, who were assessed by independent personnel, not the children's teachers, suggests that the gains observed in the public school pre-k programs are not just due to teacher bias.

An additional limitation worthy of note is that the "pre" and "T2" data collection periods in the present study were not actually before children entered the program nor were they after the school year was completely over. Instead, data collection occurred a month or so after and before the school year started or ended (for the pre-k programs) and in the case of childcare centers who do not necessarily follow the academic year schedule, many children had been at the centers for months already before the T1 assessment period. It is important to note that this assessment schedule, therefore, likely has led us to underestimate the effects of these programs on children's school readiness.

In sum, the results of this study suggest that ethnically-diverse, low-income children attending center-based care of likely mediocre quality make notable school readiness gains during their pre-kindergarten year and that children in public school pre-k programs show slightly larger gains in language and cognition. These findings nicely augment results that have been emerging out of other large-scale, national projects with more advantaged samples such as the NCEDL Multi-Site Study of Pre-kindergarten (Howes et al., 2008), NICHD Study of Early Childcare (2005a), and the National Pre-K Study (Gilliam & Zigler, 2004) showing that the benefits of high-quality pre-k programs may also accrue for ethnic minority children in poverty enrolled in garden-variety childcare and preschool programs of unknown quality. The literature is clear about how quality in early childhood programs matters, and it is clear that increasing the quality of the programs that are available to children is a worthy goal (Loeb et al., 2005). These data also provide support from a policy perspective for state-supported pre-k programs operated under the auspices of the public schools (Barnett et al., 2004; Gilliam & Zigler, 2004) and provide additional data in support of pre-k programs in general. What is new is that the present study shows that at-risk, ethnically diverse preschoolers attending community-based childcare programs are improving rather than declining. Perhaps as many have suggested (Loeb et al., 2004; Votruba-Drzal et al., 2004), center-based preschool programs serve as a buffering factor in the lives of children living in urban poverty that helps compensate for the other risk factors associated with poverty.

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