Exploring patterns of Latino/a children’s school readiness at kindergarten entry and their relations with Grade 2 achievement

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A B S T R A C T

This study contributed to the school readiness literature by taking an intrachild perspective that examined the relations between Latino/a children’s school readiness profiles and later academic achievement. Teachers rated the school readiness of 781 Latino/a kindergartners during the first month of school using the Kindergarten Student Entrance Profile (KSEP). Latent class analysis (LCA) examined KSEP profiles across social-emotional, physical, and cognitive domains and identified five distinct school readiness classes that described students’ strengths and weaknesses at kindergarten entry. Among the predictors examined, gender was the only significant difference among the top two readiness classes, with girls less likely to be in the lower of these two classes (OR = 0.38). In addition, children in the bottom three readiness classes were significantly less likely than students in the top readiness class to have preschool experience (ORs = 0.02–0.19) and had significantly lower levels of English proficiency (ORs = 0.51–0.72). Class membership was significantly associated with scores on the Grade 2 California Standards Tests and only the top two readiness classes had reading fluency rates near or above a national benchmark at the end of Grade 2. The variation of early achievement found across readiness classes also showed that considering the pattern of a child’s social-emotional and cognitive readiness might enhance school readiness assessment. Implications for integrating universal school readiness screeners within a comprehensive multigating assessment model are also discussed.

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A pressing interest of American schools is promoting the academic success of all children, a goal that is tempered by the recognition that children from less-advantaged social circumstances have diminished educational outcomes when compared with their more economically advantaged peers (Kieffer, 2010). This circumstance is evident in the achievement gaps that persist for children from various Latino/a backgrounds (Education Trust—West, 2010). Addressing the needs of these students is a particularly critical issue because Latino/a students represent the fastest growing demographic in U.S. schools (Gándara & Contreras, 2009). In a recent analysis of Latino/a student achievement in California’s schools, Rumberger and Arellano (2007) stated, “...half of the achievement gap in fourth grade exists when students walk through the door in kindergarten” (p. 71).

One response to this educational challenge has been increased attention to the topic of school readiness, which has become a focal interest of researchers, educational practitioners, and policy makers (e.g., California First 5 Initiative, Michigan Great Start, and North Carolina Smart Start). Specifically, recent research has illustrated that the successful transition from preschool to kindergarten (Gormley, 2005; Graziano, Reavis, Keane, & Calkins, 2007; Lonigan, 2006) and children’s school readiness levels upon kindergarten entry (Matthews, Kizzie, Rowley, & Cortina, 2010; Pianta, Barnett, Burchinal, & Thornburg, 2009) are crucial factors associated with later academic success. School readiness at kindergarten entry has also been found to predict students’ academic achievement in Grades 1 and 2 with samples of children from predominantly Latino/a and English learner (ELL) backgrounds (Lilles et al., 2009; Quirk, Furlong, Lilles, Felix, & Chin, 2011).

The relations between school readiness and later academic achievement suggest that school readiness assessments might be useful for the early identification of at-risk students as part of a proactive process of providing interventions that promote future academic success (Kagan & Kauerz, 2007). Used in this way, universal school readiness screening assessments could be implemented by schools to gather information on all entering kindergarten students in an effort to discern which children might benefit most from the early availability of supplemental supports. However, school readiness is multifaceted and includes social-emotional/behavioral, physical, and cognitive elements (Michela & Michalca, 2007), and previous research has established that children enter kindergarten with distinct patterns of strengths.

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One response to this educational challenge has been increased attention to the topic of school readiness, which has become a focal interest of researchers, educational practitioners, and policy makers (e.g., California First 5 Initiative, Michigan Great Start, and North Carolina Smart Start). Specifically, recent research has illustrated that the successful transition from preschool to kindergarten (Gormley, 2005; Graziano, Reavis, Keane, & Calkins, 2007; Lonigan, 2006) and children’s school readiness levels upon kindergarten entry (Matthews, Kizzie, Rowley, & Cortina, 2010; Pianta, Barnett, Burchinal, & Thornburg, 2009) are crucial factors associated with later academic success. School readiness at kindergarten entry has also been found to predict students’ academic achievement in Grades 1 and 2 with samples of children from predominantly Latino/a and English learner (ELL) backgrounds (Lilles et al., 2009; Quirk, Furlong, Lilles, Felix, & Chin, 2011).

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profiles extracted and students’ longitudinal academic achievement. The goal was to provide insights into the construct of school readiness and advance the way that school readiness screening data might be understood, interpreted, and applied by school practitioners to support Latino/a students’ academic progress.

School Readiness

Although it is generally recognized that the term school readiness can be applied broadly to describe readiness at multiple levels, including ready children, ready communities, and ready schools (National Governor’s Association, 2005), the current discussion focuses on definitions of readiness at the child level. Within this context, the term school readiness refers to the developmental status of children at school entry, with a specific emphasis on competencies that influence later academic success (Snow, 2006). In this regard, school readiness is the combinatorial effects of those intrachild skills and characteristics influenced by early childhood environments that prepare a child, to a greater or lesser extent, to positively respond to the typical curriculum of the kindergarten classroom. More specific definitions of school readiness often refer to multiple aspects of development that have been shown to influence children’s early school performance, such as language acquisition (Roth, Speece, & Cooper, 2002), emergent literacy skills (Lonigan, Burgess, & Anthony, 2000), early numeracy skills (Duncan et al., 2007), social competence (Ladd, Birch, & Buhs, 1999), attention (Fergusson & Horwood, 1995), emotional regulation (Graziano et al., 2007), and physical health/motor skill development (Bart, Hajami, & Bar-Haim, 2007). Although the exact configuration of underlying dimensions and their relative importance in determining a child’s readiness for school can vary significantly across definitions (Barbarin et al., 2008), there does seem to be consensus that school readiness is a multidimensional construct including social-emotional/behavioral, physical, and cognitive elements (Michlea & Michalca, 2007).

There are a number of contextual and experiential factors that research has identified as being associated with children’s readiness levels at kindergarten entry. Some of the most commonly researched factors include the child’s age at the time of kindergarten entry (Gullo & Burton, 1992); preschool experience (Connell & Prinz, 2002; Lee, Brooks-Gunn, Schnur, & Liaw, 1991; Turney & Kao, 2009); and socioeconomic factors, such as family income (Stipek & Ryan, 1997). A recent study conducted by Furlong and Quirk (2011) investigated the relative impact of age, preschool experience, and gender on the kindergarten readiness of Latino/a students from predominantly low income and ELL backgrounds. Consistent with previous research on other populations of children, preschool experience was the most influential factor on Latino/a children’s readiness at kindergarten entry (large effect size), followed by age (moderate effect size) and gender (small effect size). One factor that was not included in this study and that might be important when examining the school readiness of Latino/a children is English language proficiency at the time of kindergarten entry, as this may influence children’s access to the curriculum and their ability to establish supportive relationships with teachers, peers, and other school staff (Chang et al., 2007).

Research evidence has also suggested school readiness elements alone (Duncan et al.,
2007; La Paro & Pianta, 2000), and combined (Quirk et al., 2011), are significant predictors of children’s subsequent academic achievement. La Paro and Pianta (2000) conducted a meta-analysis using 70 studies that broadly examined the average correlations of academic/cognitive and social/behavioral measures taken at preschool or kindergarten to students’ longitudinal academic outcomes in Grades 1 and 2. The results indicated moderate effect sizes (all near \( r = .50 \)) for academic/cognitive measures in predicting subsequent academic/cognitive outcomes; however, effect sizes for social/behavioral measures could not be estimated due to the small sample of published studies reporting correlations between social/behavioral measures at preschool and kindergarten to later academic/cognitive outcomes. Duncan et al. (2007) conducted a similar, but more specific meta-analysis that examined the relative influence of children’s skills in reading and math, attention, and social-emotional functioning to later reading and math achievement using data from six longitudinal school readiness databases. Across all datasets, it was found that early math abilities were the strongest predictor of children’s later math \( \text{and} \) later reading abilities. Early reading abilities were identified as the next highest predictor followed by attention. Finally, Quirk and colleagues (2011) conducted a longitudinal study that followed \( N = 1,069 \) predominantly Latino/a children from kindergarten entry through the end of Grade 2. Utilizing latent-variable path analysis (latent class analysis was not used in this study), the results of the study indicated that children’s school readiness (comprised of a composite of cognitive, social-emotional/behavioral, and physical elements) at kindergarten entry predicted their phonological awareness midway through kindergarten and reading fluency at the end of Grade 1, above and beyond what was explained by mid-K phonological awareness. One unexpected finding of the study was the significant relation found between children’s school readiness and reading fluency at the end of Grade 1, controlling for mid-K phonological awareness. The researchers speculated that social-emotional/behavioral elements of the children’s school readiness might explain this relation, as previous research has identified social-emotional readiness as a specific area of strength for Latino/a students (Galindo & Fuller, 2010). These studies have yielded critical insights regarding the relative contributions of various school readiness elements on children’s longitudinal academic performance; however, the practical utility of these findings is limited due to the variable-centered approach taken in exploring these relations.

Profiles of School Readiness

A subset of recent studies has utilized a person-centered approach to examine school readiness, exploring how multiple dimensions of children’s development function together to form commonly occurring patterns or readiness profiles and how these profiles are related to children’s later academic and social outcomes (Hair et al., 2006; Halle, Hair, Wandner, & Chien, 2012; Konold & Pianta, 2005; McWayne, Hahs-Vaughn, Cheung, & Wright, 2012; Sabol & Pianta, 2012). The majority of these studies have identified school readiness profiles with samples of preschool-aged children (Halle et al., 2012; Konold & Pianta, 2005, McWayne et al., 2012; Sabol & Pianta, 2012), utilizing various compilations of parent report, teacher report, and direct assessment methods to measure school readiness. In addition, all of these studies found

2012; Sabol & Pianta, 2012)
that the likelihood of a child fitting into particular readiness profile subgroups was influenced by a multitude of demographic and contextual factors, such as ethnicity and family income, and that school readiness profiles significantly predicted children’s subsequent school-based outcomes.

The number of school readiness profile subgroups identified in these studies ranged from 3-6 subgroups; however, it is difficult to make direct comparisons of the profile groups due to variation in the underlying readiness dimensions that were considered across studies. For example, both Konold and Pianta (2005) and McWayne et al. (2012) utilized three measures of cognitive development and three measures of social development to represent children’s school readiness; however, the measures they used focused on significantly different underlying dimensions of cognitive and social development. Despite variations in the school readiness indicators that were considered across studies, some trends emerged in the types of profiles identified. In each study, there was a subgroup or subgroups of children that scored in the above average range across most or all of the school readiness domains that were assessed. These students consistently exhibited the highest levels of subsequent academic achievement and tended to come from families with higher levels of parent education and family income. In addition, each study identified a subgroup or subgroups of children that exhibited elevated levels of risk across each of the various readiness domains that were assessed, which tended to result in lower levels of subsequent academic achievement during the early elementary school years. Students in the profile groups characterized by elevated levels of risk were more likely to be boys, to come from families experiencing low income, and tended to have parents with lower levels of education.

Of published studies that have identified school readiness profiles, only one has examined profiles using readiness indicator data that were collected during the kindergarten year (Hair et al., 2006). In this study, Hair and colleagues utilized data from The Early Childhood Longitudinal Study-Kindergarten Class of 1998-1999 (ECLS-K) database to identify school readiness profiles amongst a nationally representative sample of kindergarten students (N = 17,219). Data were analyzed across four domains of school readiness, including: (a) physical health, (b) social/emotional development, (c) language development, and (d) cognitive development. Similar to the aforementioned studies examining preschool samples, data were collected using a combination of parent report, teacher report, and direct assessment. Results indicated that children could be classified into four distinct subgroups of readiness, two of which were characterized by relative strengths (“comprehensive positive development” and “social/emotional and health strengths”) and the remaining two groups characterized by specific types of risk (“social/emotional risk” and “health risk”). As expected, children from the comprehensive positive development group outperformed all other groups of students on most of the follow-up outcomes at the end of first grade and were more likely to be female, nonHispanic White, and have fewer health risks. In addition, children from the social/emotional and health strengths group outperformed the students from the two risk profiles on all outcomes at the end of first grade, suggesting that the physical health and social/emotional dimensions of school readiness make significant contributions to later school success above and beyond what would be
predicted by language and cognitive development alone. Interestingly, the children in the social/emotional and health strengths group were least likely to live in a household where English was spoken; suggesting that a substantial proportion of ELLs might have fit this profile.

These studies have clearly demonstrated that children enter school with commonly occurring patterns of developmental strengths and weaknesses. In addition, they have provided important information regarding contextual factors that contribute to children’s school readiness and illustrated how various readiness profiles are related to children’s subsequent school-based outcomes; however, some issues remain that warrant further consideration. First, the data that were used in all of these studies came from multiple sources of information, including parent reports, teacher reports, and direct assessments. While there are aspects of this approach that are desirable (comprehensive and multiple sources of information), it is unlikely that schools have the access and/or resources to compile this type of information in a way that would be efficient and useful for teachers and other school practitioners. Second, most of the existing studies have utilized large, national datasets, such as FACES and ECLS-K, which have yielded readiness profiles reflective of general student populations. However, as suggested by Hair and colleagues (2006), it is likely that readiness profiles might be qualitatively different for specific sociocultural subgroups, such as Latino/a students and ELLs. For example, multiple previous studies have found that Latino/a children tend to exhibit relative strengths in the areas of social-emotional and behavioral readiness; however, they also tend to exhibit relative weaknesses in cognitive readiness domains, particularly in terms of language development (Crosnoe, 2007; De Feyter & Winsler, 2009). Finally, while studies examining readiness profiles amongst preschool-aged children and students enrolled in Head Start have yielded valuable information regarding the structure, stability, and predictive utility of developmental profiles, many of the children that are at greatest risk for experiencing academic problems are never enrolled in preschool programs. For this reason, it is critical to conduct additional research that examines readiness profiles early in the kindergarten year, as this is the first opportunity to identify the strengths and needs of all children in order to support them during their critical first year of formal schooling.

**Purpose of the Current Investigation**

The term *school readiness* implies that some children will enter kindergarten ready for the demands of formal schooling and some will not. While this is the approach that has been taken historically by school readiness assessments, it is limited because it does not provide sufficient information with which to consider the next steps for children who enter kindergarten not ready to fully engage in the kindergarten curriculum (Carlton & Winsler, 1999). Research has demonstrated that children enter kindergarten with different patterns of strength and weakness (Hair et al., 2006; Halle et al., 2012; Konold & Pianta, 2005; McWayne et al., 2012; Sabol & Pianta, 2012), which suggests a need for differentiated instructional strategies and supports. Acknowledging its inherent complexity, this study drew upon the data set reported in Quirk et al. (2011) and extended it by re-examining school readiness data in a way that allows for the identification of underlying profiles of children’s school readiness strengths and
weaknesses in an efficient and user-friendly format. Identifying meaningful profiles would potentially increase the practical utility of school readiness screening instruments by showing how they could yield more specific readiness information with which to inform interventions designed to meet the unique needs of each child. This type of information would also help educators to efficiently allocate scarce resources to those students who are at increased risk of experiencing long-term academic challenges.

To address these issues, the current study used latent class analysis (LCA) to examine Latino/a children’s school readiness ratings derived from a universal screener (Kindergarten Student Entrance Profile [KSEP]). This approach was taken to identify commonly occurring patterns in the underlying dimensions of Latino/a children’s social-emotional/behavioral, physical, and cognitive readiness. In addition, we examined how the various school readiness profiles extracted were related to children’s academic achievement through the end of Grade 2. In particular, we selected end of Grade 2 achievement as a critical benchmark, as this is the first time that children participate in the California Standards Test (CST), providing a standardized assessment from which students’ expected academic progress could be evaluated. Reading fluency was also included as a behavioral measure of academic performance, as research has identified Grade 2 as a critical period of growth and stabilization of children’s reading fluency (Miller & Schwanenflugel, 2008). The results of this study contribute to the school readiness assessment literature by providing a new perspective on the interpretation of school readiness assessment information and a closer examination of how these readiness profiles are differentially related to Latino/a children’s long-term academic outcomes.

**Method**

**Participants and Setting**

Beginning in 2004, all kindergarten students entering a medium-sized school district in central California were assessed using a universal school readiness screen as part of general education practices. The participants in this study \( N = 781 \) included Latino/a children who (a) entered the district at the beginning of the 2005–2006 academic year, (b) were rated on the school readiness screener, and (c) had values for the predictors included in the model. Of these students, 48.6% were male, 21.8% were from migrant families (met eligibility criteria for Federally funded Migrant Education Program), 76.6% were English language learners (parents indicated that their home language was something other than English on the school registration packet), and 4.4% received formal special education services based on evaluations completed during their preschool years. School enrollment questionnaires completed by parents prior to the 2005-2006 school year also indicated that a significant proportion of the children in the district were from families experiencing low socioeconomic circumstances, with 76.6% of the students receiving free or reduced-price lunch services.

The participating K–8 school district is located in a semirural community with a population of about 100,000 people, approximately 60 miles from another similar-sized population area. At the time of data collection, the district’s total student enrollment was more than 12,500 and the average class size was 23 in kindergarten, 21 in Grade 1, and 20 in Grade 2.
In 2007–2008, 31% of the district’s students obtained scores of “proficient” or “advanced” on the state language arts assessments compared with 46% of similar-aged students throughout California. On the California mathematics standards assessment, the district performed similarly to statewide averages for students assessed at the end of Grade 2 (44% versus 43% proficient or advanced, respectively).

Measures

School readiness. The Kindergarten Student Entrance Profile (KSEP; Lilles et al., 2009; Santa Maria–Bonita School District, First 5 of Santa Barbara County, & University of California Santa Barbara, 2005) was used as a school readiness screening measure to assess social-emotional/behavioral, physical, and cognitive elements of students’ school readiness. The KSEP is not a direct assessment of the child. Rather, it is a rating scale completed by teachers on the basis of their observations and professional judgments regarding the readiness of children whom they have had the opportunity to observe in the natural classroom environment over at least a three-week period at the beginning of the school year. All of the teachers who completed ratings for this study participated in a two-hour training session focused on procedures for administering and scoring the KSEP. A significant portion of this training session was devoted to learning the KSEP rubric, which provides operational definitions for each KSEP item and examples of observable behaviors that teachers are trained to use when rating individual students.

The KSEP included 16 items linked to the social-emotional/behavioral, physical, and cognitive domains of children’s school readiness (see Appendix). A rating rubric is associated with each individual item that provides an operational definition and an example of the type of behaviors that would be indicative of a child who exhibits various levels of mastery. For example, the rubric for the KSEP item assessing impulse control contains the following descriptions of behavioral markers at each level: (a) not yet — unable to delay having wants and needs met; (b) emerging — distracted by getting wants and needs met, yet able to be redirected by others; (c) almost mastered — distracted by getting wants and needs met but redirects self; and (d) mastered — able to delay wants and needs until appropriate time. For the purposes of this study, ratings for each item were dichotomized (1 = mastered [defined as ratings of “mastered”], 0 = not mastered [defined as ratings of “not yet,” “emerging,” and “almost mastered”]; therefore, total scores for individual children ranged from 0-16, with a score of 16 indicating that the teacher rated the child at the mastery level on all items. The choice to create a dichotomous variable out of the KSEP items was made for several reasons. The original four category outcomes were highly skewed; that is, there were very few students that were rated as “not yet” across all items (6.5% of all ratings). Further, the four categories were not truly a continuous variable so comparing those who had mastered an item to those who had not mastered the same item made substantive sense, while also allowing for a solution that is more easily interpreted. Because the KSEP is not an assessment of English language proficiency, the teacher could use communications with the child in any language or mode of communication to gather information with which to complete the final ratings. In fact, many of the items from the social-emotional/behavioral and physical domains of the KSEP do not require language in any
form to demonstrate mastery.

In previous research, the KSEP has demonstrated strong reliability, with internal consistency coefficients ranging from .91 – .92 (Lilles et al., 2009; Quirk et al., 2011). These and other studies (Furlong & Quirk, 2011) have also found evidence to support the validity of KSEP, with results indicating that ratings are associated with variables known to influence children’s school readiness at kindergarten entry (age, preschool experience, and gender) and are also predictive of children’s subsequent academic achievement in Grades 1 and 2. For this sample, the internal consistency (Cronbach’s alpha) of the dichotomized 16-item ratings was .89, with subscale reliability coefficients of .85 (social-emotional), .77 (physical), and .68 (cognitive). Total scores for the sample ranged from 0 to 16 ($M = 6.53$, $SD = 4.84$).

**Academic achievement.** The English-Language Arts (E-LA) and Mathematics subtests of the California Standards Test (CST) were used to assess students’ academic achievement at the end of Grade 2. The CST is the assessment used by the California Department of Education to monitor student academic progress from Grades 2–12. The E–LA portion of the Grade 2 exam contains 65 items matched to a curriculum blueprint via a process involving multiple independent item review teams covering the areas of word analysis, reading comprehension, literary response and analysis, writing strategies, and written conventions. The Mathematics portion of the Grade 2 exam has 64 items covering number sense, algebra functions, measurement and geometry, statistics, data analysis, and probability. The internal consistency coefficient for both the E–LA and Mathematics subtests in the 2008 administration was .93 for Latino/a second graders (California Department of Education Standards and Assessment Division, 2009). The E–LA and Mathematics scores produce a standard score that is expressed on a five-category scale (1 = far below basic, 2 = below basic, 3 = basic, 4 = proficient, and 5 = advanced) with proficient and advanced representing the desired performance levels of achievement. In the 2008 administration, the estimated proportion of Grade 2 students correctly classified as proficient or advanced in E–LA and Mathematics was .92 across all students (California Department of Education Standards and Assessment Division, 2009).

**Reading fluency.** At the end of Grade 2, curriculum-based assessments were also used to measure students’ oral reading fluency, which was the average number of words read correctly per minute (WPM) on two fluency probes (Reading Lions Center, 2006a, 2006b). Previous research has established the reliability and validity of this approach to assessing students’ reading fluency using curriculum-based reading probes (Fuchs & Deno, 1992; Hartman & Fuller, 1997). These curriculum-based fluency assessments were administered to students multiple times across their first and second grade years, but only the data from the end of Grade 2 were used in the analyses. This time point was singled out because it represented the most proximal marker of students’ reading fluency to their performance on the standardized achievement measures also used in the analyses.

**Predictors.** To understand who was likely to be in each of the readiness classes or profiles, five predictors, theoretically relevant to children’s school readiness levels at kindergarten entry (Cascio & Schanzenbach, 2007; Gullo & Burton, 1992), were examined. The
predictors included in the model tested were: (a) special education placement — defined as a dichotomous variable indicating whether the child was eligible to receive special education services in kindergarten; (b) whether or not the child had previous preschool experience (state-funded preschool, Head Start, or private preschool); (c) the age of the child when the KSEP was administered — defined by the month and year in which the child was born; and (d) gender. Inasmuch as the participating school district had opened a cum folder for all children enrolled in a state-funded preschool or Head Start the year prior to kindergarten entry, all predictors were available for these children in district databases. For children who attended a private preschool or did not attend preschool, data were obtained from the kindergarten registration form and the KSEP form that was completed by teachers for each individual student during the first month of kindergarten. The final predictor considered in the model was the child’s English language proficiency level during the first quarter of kindergarten — defined as the child’s classification on the California English Language Development Test (CELDT; CTB/McGraw-Hill, 2005). The CELDT is a state test of English language proficiency administered as per state law to newly enrolled students whose primary language is not English at the beginning of every school year. The English language proficiency predictor used in the analysis was coded in accordance with CELDT overall proficiency levels, with scores ranging from 1 = beginning to 5 = advanced, with the remaining students classified as 6 = English only, indicating that they were native English speakers and did not receive the CELDT.

Procedure

The participating district’s school readiness kindergarten transition coordinator trained all teachers on the use of the KSEP prior to the beginning of the 2005–2006 school year. KSEP ratings were recorded for each student on a standard form and scores were recorded in an Excel database with an associated student identifier that was used to link readiness data with longitudinal achievement variables. All data were collected by the district as part of general education practices and shared with researchers as part of a collaborative effort to better understand the readiness of the district’s students at school entry and its relation to their later academic achievement. The database used for this study was stripped of any unique student identifiers, per the requirements of the university’s Human Subjects Review Board.

Data Analysis Plan

Latent class analysis (LCA, Lazarsfeld & Henry, 1968; McCutcheon, 1987) is a statistical approach that can be used to examine the patterns or profiles of different aspects of children’s readiness. This statistical method, similar to cluster analysis, examines students’ responses or ratings and classifies them into homogeneous groups that have similar profiles on the variables of interest. In this study’s context, LCA was used to identify school readiness profiles by detecting commonly occurring patterns of Latino/a children’s strengths and weaknesses across three underlying dimensions of readiness: social-emotional/behavioral, physical, and cognitive. LCA also allowed for the inclusion of predictors to help understand who comprises the emergent classes, as well as for additional tests of whether these profiles predicted subsequent academic outcomes, such as performance or achievement measures (Masyn, 2012).
The LCA models were estimated in Mplus, Version 6.1 (Muthén & Muthén, 2010). All models used full information maximum likelihood estimation (FIML), which allowed for missing data under missing at random assumptions (MAR, see Little & Rubin, 1990; Rubin, 1987). This approach allowed for item-level missing data; that is, students that had data on at least one of the school readiness items were included in the analysis. Students who had missing data on one or more of the predictors were not included in the analysis, which was 14 students or less than 2% of the sample. LCA models fall under the general modeling category of mixture models and, as with all mixture models, are known to converge on local, rather than global solutions (McLachlan & Peel, 2000). The use of random start values in the Mplus software helped to ensure that the results were global ones.

In general, LCA models are fit in a series of steps. First, a one-class model is fit and then the number of classes is increased. The fit of each new model (with an increase in the number of classes) is compared to the previous model. The model with the greater number of classes is selected only if increasing the number of classes results in conceptually meaningful groupings and provides good statistical fit. In the present analysis, once the number of classes was decided upon, predictors were included in the model (Nylund-Gibson & Masyn, 2011) and the means of the distal outcomes (academic achievement and reading fluency) were estimated for each class using pseudoclass draws. Pseudoclass draws are a preferred method for comparing the mean of distal outcomes compared to say a regression, because this method takes into account the fact that individuals are not assigned with 100% certainly into each of the latent classes (Clark & Muthén, 2009). Using this method, students are assigned to latent classes several times based on the distribution of their posterior class probabilities. For each of the draws, the means of the distal outcomes are estimated then averaged across all the draws to determine the overall means for each class (Clark & Muthén, 2009). Lastly, \( p \)-values from a series of pairwise Wald tests (e.g., “auxiliary (e)” in Mplus) were used to test for significant differences in means across the five readiness classes based on the means from the pseudoclass draws (see Muthén & Asparouhov, 2010).

In our application of LCA, several indicators of model fit were used because, like many latent variable models, no single statistical indicator is recommended to assess model fit. We used a combination of statistical indicators and substantive theory to decide on the best fitting model (Nylund, Asparouhov, & Muthén, 2007). The Bayesian Information Criterion (BIC; Schwartz, 1978), the most commonly used and trusted fit indices for model comparison was used, where lower values of the BIC indicated better fit. Along with the BIC, we compared models that differed in the number of classes using the Lo-Mendell-Rubin (LMR) and the bootstrap likelihood ratio test (BLRT) to evaluate if adding an additional class significantly improved model fit (for more on these fit indices see Nylund et al. [2007]). The entropy of the final model selected is reported in the text, but not used for model fit because it describes the overall classification of students into the latent classes. Entropy ranges between 0 and 1, where 1 is perfect classification and values approaching 1 indicate clear delineation of classes (Celeux & Soromenho, 1996).
Two quasi-Bayesian information-heuristic model fit comparisons, both functions of the individual model BIC values, are also included that have shown promise in latent class growth model selection (Nagin, 1999) and have been proposed for use with latent class analysis (Masyn, 2012). The Bayes Factor ($BF$) is a pairwise comparison of relative fit between two models. In our study, the computed $BF$ approximates the ratio of the probability of say, the 2-class model (called Model $K$) being correct model compared to the 3-class model (called Model $K+1$), under the assumption that one of the two models being compared is the “true” model. The value of the ratio is then compared to the Jeffery’s Scale of Evident (Wasserman, 2000), for which $1 < BF < 3$ is considered weak evidence for Model $K$ over Model $K+1$, $3 < BF < 10$ is moderate evidence for Model $K$, and $BF > 10$ is strong evidence for Model $K$. The other comparison is the approximate correct model probability ($cmP$), which estimates the probability that each model out of a given set of latent class models being considered is correct, under the assumption that the “true” model is contained within that same set of models; thus, the $cmP$ values across the given set of models sum to 1.00. The model with the largest $cmP$ value is then the model that has the highest probability of being the correct model among the set of models under consideration. See Maysn (2012) for more on these two fit comparisons and their calculations.

**Results**

The results are divided into three sections: (a) identifying the kindergarten readiness profile groups (latent classes), (b) assessing kindergarten readiness group differences with respect to predictors, and (c) assessing the readiness profiles with respect to later academic outcomes.

**Understanding School Readiness Profiles**

As described before, a series of LCA models, that varied in the number latent classes was fit. For each model, fit statistics were collected and used to help inform the decision about how many classes were sufficient to describe the heterogeneity in kindergarten readiness. Table 1 presents model fit information for the LCA models with the 1–7 latent classes that were considered. The lowest value of the BIC (13223.58), currently the most trusted fit statistic used for LCA models, indicated a 5-class model (Masyn, 2012; Nylund et al., 2007). The significant $p$-value of the LMR indicated that a 2-class model provided superior fit to a 3-class model. There was never a nonsignificant $p$-value for the BLRT, so this did not inform our decision. The Bayes Factor value went from being very small to very large at the 5-class model, and was in the strong fit range for the 5- and 6-class models. Given parsimony, the 5-class model is preferred. Also, the $cmP$ value was highest for the 5-class model indicating that this model had the highest probability of being the correct model given the 1-7-class models considered. Given the statistical support of the 5-class model, and the substantive plausibility of the solution, this model was considered the final model. The entropy for this model was .81, an acceptable value.

Figure 1 presents the item profile plot with the 16 KSEP items along the $x$-axis and the probability of mastering a given item along the $y$-axis, grouped by KSEP item domain. This profile plot was used to understand and label the emergent latent classes from the final model. The first seven items (A-G) capture emotional readiness, the next three items (H-J) measure
physical readiness, and the last six items (K-P) capture cognitive readiness.

When interpreting and labeling the latent classes, we considered both the probabilities of a class having a particular readiness characteristic, as well as how a given item differentiated across the classes. Starting with the extreme classes, we began to understand and label the classes. The top class, denoted with a solid bold blue line in Figure 1, was labeled the Balanced High class. This class, comprised of 18% of the total sample, had high probability of being rated at the mastery level for all 16 KSEP items. At the other extreme, the Extremely Low class (23% of the total sample) is denoted by a solid bold orange line in Figure 1 and had a low probability of their teachers giving them a mastery rating on any of the KSEP items.

The other three classes were all moderate in terms of readiness ratings across KSEP items. The class denoted with a solid green line (15% of the total sample) had moderate probability of getting mastery ratings on both the social-emotional and cognitive items; therefore, we labeled this class the Mod SE, Mod Cog class (henceforth, SE denotes social-emotional, Cog denotes cognitive, and Mod denotes moderate), denoting their ratings in these two domains. The next class, denoted by a dashed purple line (17% of the total sample) had moderate ratings across the SE items and low probability of mastering the cognitive items; therefore, we labeled this class the Mod SE, Low Cog class. The next class, denoted with a dashed blue line, was labeled the Low SE, Low Cog class (27% of the sample) reflecting their relatively low ratings on all the KSEP items, but not as low as the Extremely Low class.

Readiness class and KSEP items mastered. The mean number of KSEP items mastered for each of the readiness classes was examined and, as expected, differed across the five profiles. Students in the Balanced High on average were rated as mastering more KSEP items (13.97 out of 16 total) than the Mod SE, Mod Cog (9.43), Mod SE, Low Cog (8.17), Low SE, Low Cog (3.84), and Extremely Low (0.86) classes. Post-hoc comparisons of each group’s mean total KSEP score were all significantly different ($p < .05$).

Examining Predictors and Distal Outcomes

Table 2 presents descriptive information of the predictors and distal outcomes used in the analysis. The latent class variable was regressed on to all of the predictors included in the model. Since the latent class variable is a categorical latent variable, the regression of this variable on the predictors was a multinomial logistic regression, and instead of interpreting regression coefficients, we interpreted logits. We chose the students in the Balanced High class to be the comparison group, and compared the other four classes to this group on each of the predictors. Table 3 presents the logit parameters, their standard errors, the corresponding $t$-value, and the odds ratio for each comparison.

Comparing students in the Mod SE, Mod Cog class to the Balanced High class, there was no significant difference in age, English proficiency (-0.50, $p > .05$, OR = 0.95), kindergarten special education placement (-0.33, $p > .05$, OR = 0.72), or preschool experience. That is, students in these two classes have similar ages and English proficiency, and had the same proportion of students with special education placements and preschool experience. There was a significant gender effect (-0.96, $p < .05$, OR = 0.38) — girls were significantly less likely to be in
the Mod SE, Mod Cog class compared to the Balanced High class.

Children in the Mod SE, Low Cog class were similar to those in the Balanced High class with respect to age (-0.52, \( p > .05, OR = 0.59 \)) and gender (0.46, \( p > .05, OR = 1.58 \)). Though not statistically significant, there was a notably small odds ratio for special education (-1.17, \( p > .05, OR = 0.31 \)). There were significant differences with respect to English proficiency (-0.67, \( p < .05, OR = 0.51 \)) and preschool experience (-1.73, \( p < .05, OR = 0.19 \)). These results indicated that children in the Mod SE, Low Cog class had significantly lower English proficiency scores and had less children exposed to preschool, and had lower odds of placement in special education compared to those in the Balanced High class.

Comparing children in the Low SE, Low Cog class to the Balanced High class, there was no difference with respect to age (-0.20, \( p > .05, OR = 0.59 \)). There were significant differences with respect to English proficiency (-0.34, \( p < .05, OR = 0.72 \)), gender (-1.01, \( p < .05, OR = 0.37 \)), and preschool exposure (-1.68, \( p < .05, OR = 0.19 \)). There was a notably large odds ratio for special education, though not statistically significant (0.93, \( p > .05, OR = 2.53 \)). That is, children in the Low SE, Low Cog class had significantly lower English proficiency scores, were less likely to be females, had higher odds of placement in special education, and were significantly less likely to have preschool exposure compared to the students in the Balanced High class.

Lastly, comparing the Extremely Low class to the Balanced High class, there were no gender differences. However, there were significant differences in age (-1.12, \( p < .05, OR = 0.33 \)), English proficiency (-0.51, \( p < .01, OR = 0.60 \)), and preschool exposure (-3.98, \( p > .01, OR = 0.02 \)). Again, there was a notably large odds ratio for special education placement, though not statistically significant (1.46, \( p > .05, OR = 4.32 \)). Hence, the children in the Extremely Low class were significantly younger, had significantly lower English proficiency scores, higher odds of placement in special education, and significantly less exposure to preschool than those in the Balanced High class.

**Differences in Academic Outcomes and Fluency Based on LCA Readiness Classification**

To test the predictive validity of the latent classes, we examined whether academic outcomes differed among the five readiness classes. A Wald test was used to compare achievement and fluency means based on pseudoclass draws for all between-group comparisons. This allowed us to test for differences in mean academic scores across readiness classes obtained nearly three years after the KSEP ratings were made. Figure 2 presents the mean academic achievement scores (mean E-LA and Math proficiency level categorizations) for the five readiness groups.

With respect to Math and E-LA, two of the five classes scored, on average, in the basic to proficient range of the CST. The Balanced High class had the highest mean for both English Language Arts (E-LA) and Math. For both the Math and E-LA scores, the Wald test based on the pseudoclass draws indicated that the Balanced High and the Mod SE, Mod Cog classes were not statistically different from each other, but did have significantly higher mean Math and E-LA scores than the other three classes. The bottom three classes — Mod SE, Low Cog; Low SE, Low
Cog; and Extremely Low — were all similar to each other in terms of their E-LA and Math scores. That is, while there was slight variation in the scores on E-LA and Math for these three classes, they were not statistically different from each other. While the mean differences across each of the five readiness classes appear relatively small, the effects sizes were large due to low within-class variation of the means. Specifically, comparing the mean of the Mod SE, Mod Cog class (the lower of the two higher scoring classes) to the Mod SE, Low Cog class (the highest of the three lower scoring classes), which represents the lower bound of all possible effects size comparisons, Cohen’s $d$ was 3.38 for Math and 2.76 for E-LA which are considered large effects (Cohen, 1977).

A similar pattern occurred with the Grade 2 fluency scores when comparing the five readiness classes using pseudoclass draws. The Balanced High class had the highest fluency score (words per minute [wpm]) in Grade 2, 94.6), followed by the Mod SE, Mod Cog class (92.1 wpm). Based on the Wald test from the pseudo-class draws, these two classes did not differ significantly in terms of their Grade 2 fluency. However, these two classes did have significantly higher fluency means than the other three classes — the Mod SE, Low Cog (80.3 wpm), Low SE, Low Cog (82.2 wpm), and Extremely Low (80.8 wpm). These lower three classes were not significantly different from each other in terms of Grade 2 fluency.

Summarizing the important differences in the distal outcome comparisons, there was a consistent finding. In all pairwise comparisons for all three second-grade outcome variables (E-LA, Math and Fluency), the Balanced High and Mod SE, Mod Cog groups had consistently higher means than the other three classes. Further, these two classes were not statistically different from each other. The bottom three classes were also not statistically different from each other on all three second-grade outcomes.

**Discussion**

The primary aim of this study was to explore the school readiness profiles of Latino/a students and if those profiles were related to their early school success. The results of this study provided additional support for the importance of using a universal school readiness screener with Latino/a kindergarten students. This is important because other research has found that for Latino/a students, as much as 40% of academic achievement in Grade 4 can be accounted for by variables known at kindergarten entry (Rumberger & Arellano, 2007). These factors contribute to the persistent gap in achievement between Latino/a children from low-income circumstances and White students from more affluent income backgrounds.

What we found was both encouraging and discouraging. An encouraging finding was that 33% of the students were in the top two readiness classes (Balanced High and Mod SE, Mod Cog) and these students were more likely than not to have grade-expected reading fluency and proficient/advanced scores on state E-LA and Math standards assessments at the end of Grade 2. To the extent that more Latino/a children enter school with such profiles, it would have the potential to reduce their achievement gap. However, we also found a substantial proportion of children (28%) were rated by their teachers in the Extremely Low readiness class and 67% of our sample were rated in the bottom three readiness profile groups. This finding demonstrated the
substantial educational challenges that need to be addressed for Latino/a children, many of whom are from ELL backgrounds and communities that have high rates of economic challenges. Most importantly, all three of the lower readiness profile groups were more likely than not to fall below normative expectations for later reading fluency and E-LA and Math skill development, placing them at long-term academic risk.

With respect to the LCA, we identified five distinct school readiness classes or profiles that described Latino/a students’ readiness strengths and weaknesses at kindergarten entry. There were many similarities between the results of our analysis and those found by Hair and colleagues (2006), who examined a more diverse, nationally representative sample of kindergarten-aged children. First, the top and bottom readiness classes identified in our analysis appeared to have a similar readiness profiles to those identified in Hair et al. (2006), exhibiting relative strengths (top group) and weaknesses (bottom groups) across most or all readiness domains. In addition, these groups of children tended to perform similarly in each study on follow-up academic assessments, with the top groups outperforming each of the bottom groups across all academic outcomes. Conversely, there were substantive differences between the findings of Hair et al. and the current study regarding the students who were rated in the middle readiness ranges. The pattern of readiness exhibited by our Mod SE, Low Cog class was most similar to the Social/Emotional and Health Strengths group from Hair et al., with relative strengths in the social-emotional and physical domains accompanied by relative deficits in the cognitive domain. However, the academic outcomes for the Social/Emotional and Health Strengths group more closely resembled the academic outcomes of the Mod SE, Mod Cog class in this study. Thus, it appears that moderate levels of cognitive readiness are needed in addition to relative strengths in the social-emotional and physical domains for Latino/a children to have a reasonable chance of succeeding academically in the early elementary grades. Finally, the pattern of profiles identified in this study were largely consistent with previous research that has found evidence suggesting that Latino/a children are more likely to exhibit strengths in the areas of social-emotional and behavioral readiness accompanied by relative weaknesses in cognitive readiness domains (Crosnoe, 2007; De Feyter & Winsler, 2009). Specifically, 50% of the Latino/a children from our sample were identified in readiness classes characterized by moderate to high social-emotional readiness ratings, yet only 33% of our sample were classified in profile groups characterized by moderate to high ratings in the cognitive readiness domain.

Predictors Associated with Readiness Classes

An examination of the five readiness classes in relation to the predictors revealed that the classes differed in patterns that were generally consistent with previous research. The only predictor that distinguished between children from the Balanced High and Mod SE, Mod Cog classes was gender, with a significantly higher likelihood that children in the Balanced High group would be female. This is consistent with previous research suggesting some school readiness advantage for girls (Zhai, Brooks-Gunn, & Waldfogel, 2011). Also consistent with previous research, preschool experience (Ansari, & Winsler, 2012; Fram, Kim, & Sinha, 2012) and English proficiency (Hakuta, Butler, & Witt, 2000) were the only two predictors that
consistently differentiated the Balanced High class from the three lowest rated readiness classes, with the Balanced High group being more likely to have formal preschool experience and higher levels of English proficiency. In particular, the odds ratio for the Extremely Low class indicated that they were 50 times less likely to have preschool experience than children in the Balanced High class, supporting previous research that has suggested preschool experience may be particularly critical for children from Latino/a and low-income backgrounds (Furlong & Quirk, 2011; Loeb, Bridges, Bassok, Fuller, & Rumberger, 2007). Finally, children from the Extremely Low class were significantly younger than children from the Balanced High class, which is consistent with previous research suggesting that age is related children’s school readiness (Stipek & Byler, 2001), also specifically for Latino/a children (Furlong & Quirk, 2011). Overall, it appears that the two highest readiness classes were comprised of a female dominant K-ready class (Balanced High) and a male dominant K-ready class (Mod SE, Mod Cog) and that preschool experience and English proficiency are two particularly influential factors on the readiness of Latino/a children.

Grade 2 Academic Performance and Classes

Another important finding from this study was that the five school readiness classes that were identified differed significantly in terms of their longitudinal academic achievement. Overall, the achievement scores for the various classes at the end of Grade 2 tended to align with their school readiness ratings at kindergarten entry, with the top two readiness classes consistently outperforming the three lowest rated classes on all academic outcomes at the end of Grade 2. In addition, the mean achievement test and fluency scores for the three lowest readiness classes did not differ significantly. The practical significance of these mean differences for schools may be better understood when one considers the effect sizes for these differences across readiness classes. For example, effect sizes of 3.38 and 2.76 were found for the mean differences between the Mod SE, Mod Cog class and the Mod SE, Low Cog class on the Math and E-LA subtests of the CST, respectively. These effect sizes were the smallest across all mean difference comparisons between the two highest and three lowest rated readiness classes on the CST; however, using Cohen’s (1977) recommendations for interpreting effect size, they indicated large effects (> .80). Similarly, only the two highest rated readiness classes had mean fluency rates near or above grade-level expectations (90 wpm; Hasbrouck & Tindal, 2006) at the end of Grade 2. These findings are consistent with previous school readiness research that has found children who enter kindergarten with higher levels of readiness are more likely to succeed academically than students who enter kindergarten with lower levels of readiness (Duncan et al., 2007; Lilles et al., 2009; Quirk et al., 2011; Romano, Babchishin, Pagani, & Kohen, 2010).

Advantage of a Profile/Classes School Readiness Approach

The results described above are consistent with historical perspectives on school readiness, which tend to interpret assessment results at the global level using a total summary score. Interpreting school readiness assessments in this way would assume a monotonic pattern of performance at the end of Grade 2 consistent with total readiness ratings from the beginning of kindergarten. While the results found in this study on the general high and low ends of
readiness profiles tended to follow these achievement patterns, further examination of the achievement patterns amongst the middle and lower readiness classes illustrated how a global interpretation of total readiness scores is problematic. Specifically, a consistent pattern of progressively lower total readiness ratings was found across the three lowest readiness classes. However, these classes were virtually identical in terms of their end of Grade 2 achievement; therefore, students who on average mastered approximately eight of the readiness items (Mod SE, Low Cog) were at equivalent risk of experiencing later academic problems as those students who on average mastered less than one readiness item (Extremely Low). In addition, there were significant differences found between the Mod SE, Mod Cog and the Mod SE, Low Cog classes across all achievement measures at the end of Grade 2, yet the mean total readiness scores for these classes differed by only 1.26 mastered items during the first month of kindergarten, which was the smallest difference amongst any of the five classes.

A closer examination of the relative strengths and weaknesses of these classes revealed two important findings. First, it appears that the cognitive domain of school readiness was more influential on Latino/a children’s longitudinal academic outcomes than the social-emotional and physical domains. The characteristic that distinguished all of the lowest achieving profile groups from the two groups that achieved at a higher level at the end of Grade 2 was a pattern of low ratings on the cognitive readiness items. However, this should not be interpreted to mean that social-emotional readiness and physical readiness are inconsequential. The Mod SE, Mod Cog class was able to overcome lower cognitive ratings than the Balanced High class to achieve similarly on all three outcomes by the end of Grade 2. Thus, it appears that modest deficits in cognitive readiness can be overcome, particularly when Latino/a children exhibit some areas of strength in the social-emotional and physical readiness domains. However, as the achievement pattern for the Mod SE, Low Cog group suggests, relative strengths in the social-emotional and physical readiness domains appear to be insufficient for overcoming more substantial deficits in cognitive readiness.

**Implications for Practice**

The findings of this study suggest some important implications for school practitioners. First, the patterns of school readiness and later academic achievement found in this study support previous findings that children who exhibit significant deficits in school readiness are at risk of experiencing later academic difficulties (Duncan et al., 2007; Hair et al., 2006; Quirk et al., 2011). Therefore, systematic and universal school readiness screenings appear to provide viable information about later achievement, which could be utilized to jumpstart the process of early identification and intervention for students at risk of experiencing academic problems. However, the findings associated with this study’s latent class analysis suggested that it is not feasible, nor desirable, for schools to utilize school readiness screening data at the individual level to prioritize children’s early needs based solely on a screener’s total score. Rather, schools need to be prepared to address the needs of children with specific patterns of strengths and weaknesses, such as those identified in this study. In particular, the results of this study suggested that Latino/a students who are rated in the middle range of readiness at kindergarten entry with
specific deficits in the cognitive domain were similarly at high risk of struggling academically as those students rated in the lower readiness ranges. When educators use a single total score or a traditional cut-point strategy to identify kindergarten students who may be at-risk for later academic struggles, they might misidentify a substantial group of children (17%, Mod SE, Low Cog in this study’s sample) who might otherwise benefit from early interventions and support.

How might educators then make best use of universal school readiness assessments, such as the KSEP? Based on the results of this study and our use of universal school readiness assessments in schools, one approach is for educators to consider readiness assessments as a point-in-time status indicator of a child’s development during the crucial 4- to 7-year-old period. Kindergarten entrance represents a pivot point in a child’s development that reflects the preparation during the years prior to entering kindergarten and their response to formal education through Grade 2. As such, a universal school readiness rating completed during the first month of kindergarten should be part of broader efforts to assess and monitor each child’s developmental trajectory. For example, Ahtola et al. (2011) found that preschool and kindergarten teachers’ communication and sharing of child information and curricular expectations prior to kindergarten entry predicted later academic skills. Efforts to increase articulation from preschool to kindergarten should help to raise the readiness levels of children. However, not all children have access to universal preschool, hence educators also need to embed their universal school readiness screening with a comprehensive district plan for monitoring the academic progress of all children throughout the kindergarten year. A universal screen, when used to identify readiness profiles, could help to allocate those progress-monitoring resources in a more efficient manner. Additional studies, designed to explore how teachers can make use of the KSEP ratings, are being carried out in our work at a university laboratory school. After completing the KSEP ratings, we are implementing an academic consultation-coaching model to support kindergarten teachers’ efforts to implement targeted academic and social-emotional supports for the most at-risk students. In another example, the KSEP is being used throughout the districts in one county and a data portal is being created that calculates the odds of each child being in each of the five KSEP profiles identified in this study, with this information used to prioritize the allocation of instructional support resources.

In addition, the findings from this study challenge some of the traditional views on how to most effectively interpret and use school readiness screening data. School readiness assessments have traditionally been effective for informing educators regarding which students are ready and which students are not; however, the approach taken in this study may help to improve the precision with which schools are able to utilize data in the middle ranges of school readiness. The benefits of a universal screen, such as the KSEP used in this study, is that the low cost of implementation and ease of use means that it can be implemented with fidelity and sustained over time. Of course, a universal screener cannot provide the detailed information to fully evaluate each child’s needs, but when used as part of a multigating early assessment system, it might support the more efficient use of educational resources and target them to the children with the greatest need.
Limitations

This study was conducted with a sample comprised of Latino/a children, many of whom were English language learners and came from homes experiencing low income. Therefore, the generalizability of these profiles might be limited. However, Latino/a children are the fastest growing demographic in U.S. schools (Gándara & Contreras, 2009); hence the results of this study pertain to a subgroup of students that are a vital to the U.S.’s economic and social viability. Nonetheless, for the purposes of identifying profiles, there was sufficient range to capture school readiness classes that may be common across similar school districts. Despite limits to the generalizability of this study’s findings, we note that the educational success of English language learners is a pressing national issue and any effort to bolster the academic achievement of these children is an important educational and social objective.

Second, the school readiness data used to form the classes identified in this study were derived from a single source — KSEP ratings provided by teachers. This approach comes at a cost in terms of the accuracy with which the school readiness latent construct can be represented when compared with those based on multiple sources of information (parent ratings, teacher ratings, and direct testing of children); however, our approach can be justified on pragmatic grounds. A contribution of this study is that it demonstrated that a universal school readiness rating procedure that can be efficiently and feasibly administered by teachers in schools can yield useful information on school readiness profiles. This certainly is not the only possible source of readiness information, but unless meaningful information is readily available, it is unlikely to be adopted by schools and thereby influence readiness-related decisions. With respect to the KSEP used in this study, the participating school district has now used it with 100% of all entering kindergarten students for eight years, which shows the potential for sustained wider dissemination.

Finally, there were some items on the KSEP that did not appear to provide substantial differentiation among the profile groups extracted. For example, items in the physical readiness domain did not yield information that defined any of the profile groups. In addition, the KSEP item assessing children’s knowledge of shapes, a commonly used item in school readiness assessments (e.g., Hintze, Ryan, & Stoner, 2003; Panter & Bracken, 2009), did not contribute to class membership in the expected manner. Acknowledging the iterative and ongoing nature of scale development, it appears that a reexamination of the items included (and not included) on the KSEP could further enhance the validity of the tool as a school readiness screener. Given the results found in the current study, items that capture additional aspects of cognitive readiness such as working memory (Sabol & Pianta, 2012) and early math abilities (Duncan et al., 2007) could be particularly beneficial.

Conclusions

The findings from this study suggested that school readiness is not a simple composite of readiness indicators from various domains, such as social-emotional, physical, and cognitive readiness. Attending to the differential impact of various readiness domains on students’ subsequent academic performance could allow for greater precision regarding the way in which
schools interpret and utilize school readiness screening data to inform early and targeted supports for Latino/a children at risk of experiencing later academic problems. More research is needed to examine how this additional information can be most effectively linked to differentiated follow-up assessments and interventions. Ultimately, the most positive result would be for school readiness screening data to be utilized in an effective way to inform early and targeted action.

References


Table 1
Fit information for LCA Model with 2–7 Classes

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Note. Bolded values in the tables indicate the model that was preferred by the given fit index.

Table 2
Descriptive Statistics of Predictors, KSEP Items, and Distal Outcomes

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<td>0.39</td>
</tr>
<tr>
<td>Female (0 = male, 1 = female)</td>
<td>0.00</td>
<td>1.00</td>
<td>0.51</td>
<td>0.50</td>
</tr>
<tr>
<td>Kindergarten CELDT</td>
<td>0.00</td>
<td>1.00</td>
<td>2.80</td>
<td>1.98</td>
</tr>
<tr>
<td>Special education placement</td>
<td>0.00</td>
<td>1.00</td>
<td>0.05</td>
<td>0.21</td>
</tr>
<tr>
<td>Preschool (0 = no preschool experience, 1 = some preschool experience)</td>
<td>0.00</td>
<td>1.00</td>
<td>0.44</td>
<td>0.49</td>
</tr>
<tr>
<td>Distal Outcomes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 2 CST English-Language Arts</td>
<td>1</td>
<td>5</td>
<td>3.31</td>
<td>1.15</td>
</tr>
<tr>
<td>Grade 2 CST Mathematics</td>
<td>1</td>
<td>5</td>
<td>3.73</td>
<td>1.13</td>
</tr>
<tr>
<td>Grade 2 fluency (words per minute)</td>
<td>1.50</td>
<td>188.50</td>
<td>85.07</td>
<td>31.74</td>
</tr>
</tbody>
</table>

Note. CST = California Standards Test. CST performance levels were: 1 = far below basic, 2 = below basic, 3 = basic, 4 = proficient, and 5 = advanced.
Table 3

Log Odds Coefficients and Odds Ratio for the Five-Class Model with Age, Kindergarten CELDT Scores, K Special Education Status, Gender, and Preschool Experience as Predictors Using the Balanced, High Class as the Comparison Group

<table>
<thead>
<tr>
<th>Readiness Class</th>
<th>Effect</th>
<th>Logit</th>
<th>SE</th>
<th>t</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate SE, Moderate Cog</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Age</td>
<td>0.37</td>
<td>0.49</td>
<td>0.77</td>
<td>1.45</td>
<td></td>
</tr>
<tr>
<td>K CELDT</td>
<td>-0.05</td>
<td>0.09</td>
<td>-0.62</td>
<td>0.95</td>
<td></td>
</tr>
<tr>
<td>K Special Ed</td>
<td>-0.33**</td>
<td>0.95</td>
<td>-0.35</td>
<td>0.72</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>-0.96**</td>
<td>0.36</td>
<td>-2.66</td>
<td>0.38</td>
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</tr>
<tr>
<td>Preschool</td>
<td>0.23</td>
<td>0.51</td>
<td>0.45</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>Moderate SE, Low Cog</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.52</td>
<td>0.51</td>
<td>-1.03</td>
<td>0.59</td>
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</tr>
<tr>
<td>K CELDT</td>
<td>-0.67**</td>
<td>0.10</td>
<td>-6.67</td>
<td>0.51</td>
<td></td>
</tr>
<tr>
<td>K Special Ed</td>
<td>-1.17</td>
<td>3.39</td>
<td>-0.35</td>
<td>0.31</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>0.46</td>
<td>0.46</td>
<td>0.99</td>
<td>1.58</td>
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</tr>
<tr>
<td>Preschool</td>
<td>-1.73**</td>
<td>0.61</td>
<td>-2.86</td>
<td>0.18</td>
<td></td>
</tr>
<tr>
<td>Low SE, Low Cog</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.20</td>
<td>0.41</td>
<td>-0.47</td>
<td>0.82</td>
<td></td>
</tr>
<tr>
<td>K CELDT</td>
<td>-0.34*</td>
<td>0.17</td>
<td>-1.96</td>
<td>0.72</td>
<td></td>
</tr>
<tr>
<td>K Special Ed</td>
<td>0.93</td>
<td>0.76</td>
<td>1.22</td>
<td>2.53</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>-1.01*</td>
<td>0.43</td>
<td>-2.32</td>
<td>0.37</td>
<td></td>
</tr>
<tr>
<td>Preschool</td>
<td>-1.68**</td>
<td>0.55</td>
<td>-3.05</td>
<td>0.19</td>
<td></td>
</tr>
<tr>
<td>Extremely Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-1.12**</td>
<td>0.45</td>
<td>-2.46</td>
<td>0.33</td>
<td></td>
</tr>
<tr>
<td>K CELDT</td>
<td>-0.51**</td>
<td>0.09</td>
<td>-5.76</td>
<td>0.60</td>
<td></td>
</tr>
<tr>
<td>K Special Ed</td>
<td>1.46</td>
<td>0.97</td>
<td>1.51</td>
<td>4.32</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>-0.34</td>
<td>0.37</td>
<td>-0.93</td>
<td>0.71</td>
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</tr>
<tr>
<td>Preschool</td>
<td>-3.98*</td>
<td>0.56</td>
<td>-7.06</td>
<td>0.02</td>
<td></td>
</tr>
</tbody>
</table>

Note. SE = Social-Emotional, Cog = Cognitive. * p < .05, ** p < .01.
Figure 1. Conditional item probability profile plot for the five-class kindergarten readiness profiles. Relative class sizes are presented in the legend. See the Appendix for the wording of the KSEP items: A to G = social-emotional domain, H to J = physical domain, and K to P = cognitive domain. Note. SE = Social-Emotional.
Figure 2. Average performance level on the California Standards Test Math and English Language Arts (1 = far below basic, 2 = below basic, 3 = basic, 4 = proficient, and 5 = advanced).
Appendix

*Kindergarten Student Entrance Profile Item Content*

<table>
<thead>
<tr>
<th>Readiness Domain</th>
<th>KSEP Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social-Emotional/Behavioral</td>
<td>A. Seeks adult help when appropriate</td>
</tr>
<tr>
<td></td>
<td>B. Engages in cooperative play activities with peers</td>
</tr>
<tr>
<td></td>
<td>C. Exhibits impulse control and self-regulation</td>
</tr>
<tr>
<td></td>
<td>D. Stays with or repeats a task</td>
</tr>
<tr>
<td></td>
<td>E. Separates appropriately from caregiver</td>
</tr>
<tr>
<td></td>
<td>F. Is enthusiastic and curious in approaching new activities</td>
</tr>
<tr>
<td></td>
<td>G. Follows rules when participating in routine activities</td>
</tr>
<tr>
<td>Physical</td>
<td>H. Uses tools with increasing precision</td>
</tr>
<tr>
<td></td>
<td>I. Demonstrates general coordination</td>
</tr>
<tr>
<td></td>
<td>J. Demonstrates sense of own body in relation to others</td>
</tr>
<tr>
<td>Cognitive</td>
<td>K. Recognizes own written name</td>
</tr>
<tr>
<td></td>
<td>L. Writes own name</td>
</tr>
<tr>
<td></td>
<td>M. Demonstrates expressive abilities</td>
</tr>
<tr>
<td></td>
<td>N. Understands that numbers represent quantity</td>
</tr>
<tr>
<td></td>
<td>O. Recognizes colors</td>
</tr>
<tr>
<td></td>
<td>P. Recognizes primary shapes</td>
</tr>
</tbody>
</table>

*Note.* Additional information on the KSEP, including a copy of KSEP assessment materials, can be obtained by contacting the corresponding author of this study.