

Preliminary Development of the Kindergarten Student Entrance Profile

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The transition into kindergarten is important because it sets the foundation for future academic achievement. Identifying a child's readiness at school entry and intervening appropriately facilitates positive academic outcomes. The Kindergarten Student Entrance Profile (KSEP) is a school district developed universal screening measure used to assess children's readiness for school. This action research study reports on the psychometric proprieties of the KSEP, including its prediction of academic achievement through grade 2. Results suggest promising psychometric characteristics. Discussion focuses on uses of the KSEP for school readiness evaluations and future research.

With growing recognition of the importance of early education, interest in the topic of school readiness has increased among researchers, policy makers, and educators. School readiness is no longer thought of as merely a chronological benchmark, but rather a composite of cognitive, social-emotional, behavioral, and physical elements that are associated with successful transition to elementary school (Pianta, 2007; Snow, 2006), paired with how the school receives the children (Carlton & Winsler, 1999; Pianta, 2007). Literature on early education and school readiness illustrates that successful transition from preschool to kindergarten predicts later academic success (Gormley, 2005; Graziano, Reavis, Keane, & Calkins, 2007; Lonigan 2006). Identifying a student's readiness for school is one way to identify at-risk students and provide interventions to promote future academic achievement (Kagan & Kauerz, 2007).

This interest to identify children's preparation for kindergarten has provoked the development of school readiness assessments (Meisels, 2007). Using commercially developed standardized assessments, however, can be costly in time of administration and on limited district financial resources. To compensate for these expenses, some districts have created in-house measures to evaluate the developmental readiness of incoming students. When this approach is taken, it is important to assess the psychometric properties of such district-implemented procedures (Bagnato, 2007). This article describes and examines a district-designed school readiness universal screening measure, the Kindergarten Student Entrance Profile (KSEP). Following a review of the importance of school readiness, this study examines the KSEP's psychometric properties and discusses its viability as an assessment measure.

Why is School Readiness Important?

One of the primary goals of the National Education Goals Panel is that all children should start school ready to learn (NEGP, 1990). The concept of school readiness is one of great importance because

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the transition into kindergarten lays the foundation for future academic outcomes. Early school experiences influence achievement trajectories because academic success is known to stabilize even as early as grade 1 (Entwisle & Hayduk, 1988; Torgesen, & Burgess, 1998). Students with low academic achievement early in school are at a greater risk for school difficulties and have higher dropout rates (Simner & Barnes, 1991). Preparing students in all areas of school readiness can contribute to positive academic outcomes.

Cognitive readiness is significantly related to later academic performance. Torgesen and Burgess (1998) found that poor readers at the end of grade 1 face difficulties catching up to their more fluent reading peers. Early literacy skills predict later reading and writing fluency, and more extensive language development (Bowman, Donovan, & Burns, 2000; Lonigan, 2006). Children who struggle with early reading tasks develop negative attitudes toward reading and tend to avoid it as an unpleasant task, which contributes to a negative cycle of less time spent in reading activities and further decreasing reading skills (Lonigan, 2006).

In addition to cognitive and academic skill development, social-emotional development plays a significant role in shaping children's early school experiences. Ladd, Herald, and Kochel (2006) identified social-emotional characteristics at school entry to be more influential than any other school readiness element at predicting school adjustment and academic progress. Kindergarten teachers also rated social-emotional development as more important than cognitive abilities at school entry (Lewit & Baker, 1995). Children's ability to regulate emotions improves their ability to successfully navigate the transition to kindergarten, and acquire essential academic information (Graziano et al., 2007). Graziano and colleagues (2007) found that children's emotional regulation, as reported by parents, positively predicted academic success including teacher rated productivity in the classroom setting, and achievement on standardized assessments of early literacy and math skills.

Student behavior in preschool is another important aspect of school readiness. Children who exhibit positive behaviors in preschool are seen as more sociable in kindergarten, whereas children who exhibit aggressive behaviors are more likely to be rejected by peers and viewed as hostile and aggressive by teachers (Ladd & Price, 1987). Additionally, children with better emotional regulation tend to have positive relationships with teachers (Ladd & Price, 1987).

Children's physical well-being also influences their school readiness (Pascoe, Shaikh, Forbis & Etzel, 2007). Physical health, nutrition, physical activity, strength, stamina, and motor skill development all form the foundation for future development and learning that is essential for subsequent academic success (Scott-Little, Kagan, & Frelow, 2006).

Helping children to acquire competence across all school readiness domains is important because these domains are interrelated. Physical dexterity influences a children's cognitive development, just as cognition plays a role in their social understandings and motor competence. Children who have a broad base of experiences tend to acquire complex skills more rapidly (Bowman, Donovan, & Burns, 2000). In addition, preschool experience predicts children's academic performance during the transition to kindergarten. Children who have positive preschool experiences receive higher ratings from teachers for positive academic behavior and readiness than children with negative or no preschool experiences (Ladd, 1990). Children with positive pre-kindergarten experiences also tend to develop positive attitudes toward school and the school environment.

Assessing School Readiness

Increased recognition of the importance of early intervention has led to advances in the assessment of young children's school readiness. Early identification of school readiness strengths and weaknesses may enhance the development of all children when linked with early interventions and supports for those children in need. However, presently there is no universally accepted early screening process. As discussed previously, school readiness incorporates several elements that make it difficult to define, and consequently, equally difficult to assess (Meisels, 2007; Snow, 2006). Preschool-aged children can be slow to build rapport, quick to frustrate and fatigue, unfamiliar with test-taking etiquette, and pres-

ent several other characteristics that make formal assessment a challenge (Bracken, 2000; Thurlow & Gilman, 1999). In addition, school readiness is a fluid construct that evolves as a child develops and encounters new experiences (Pianta, 2007).

Recent approaches to assessing school readiness have shifted the focus away from cognitive assessment to include broader ecological factors that incorporate multifaceted elements of school readiness. In addition to taking an ecological perspective, these approaches use both direct observations and assessments to evaluate children's competence to perform expected tasks at a developmentally appropriate level within a variety of settings (Bagnato, 2007).

The challenge facing school districts, of course, is how to accomplish this in a cost-effective, yet meaningful manner. Consequently, many districts develop local school readiness screening measures to accomplish these goals; however, these district-developed instruments are rarely subjected to research and consequently their psychometric properties are usually unknown. Screening is seen as a cost-effective method because it is a relatively brief and inexpensive way to assess a large numbers of children (Thurlow & Gilman, 1999). Nonetheless, it is important to hold these district-developed measures to the same psychometric standards as commercially developed measures of school readiness.

Purpose of This Study

The current investigation evaluates the Kindergarten Student Entrance Profile (KSEP), a district-developed school readiness assessment created to provide a universal measure of school readiness of incoming kindergarten students. This study addressed the following research questions: (a) What is the factor structure of the KSEP? (b) Does the KSEP predict students' subsequent academic performance? and (c) Can the KSEP be used as a broad indicator of children's readiness for school by informing educators about the level of competence and mastery needed to increase the odds of later academic success?

METHOD

Participants

Beginning in 2004, all kindergarten students entering a medium-sized school district in central California were administered the KSEP as part of general education practices. School enrollment questionnaires identified the students to be primarily Hispanic (88%) and of low socioeconomic backgrounds, with 79% of the students receiving free/reduced priced lunch services (Kidsdata.org). Students entering the district in the 2005-06 academic year with complete KSEP data were included as participants in the current study ($N = 671$). Of these students, 48% were males, 91% were Hispanic, 20% were migrant students, 64% were English Language Learners, and 5% were receiving Special Education services.

Measures

Kindergarten Student Entrance Profile. The Kindergarten Student Entrance Profile (KSEP) is a universal screening measure used to assess the physical, social-emotional, and cognitive elements of students' school readiness (see Appendix A for a listing of the readiness content areas included and contact information to obtain KSEP materials). The KSEP involves teachers (a) being trained to become familiar with the 16 content areas and their associated rating rubrics, (b) observing the children in the school environment over a three-week period, and (c) providing a final assessment of the child's behavior/performance. Early education professionals (preschool, Head Start, and kindergarten teachers) completed the KSEP.

The KSEP includes 16 items related to the social-emotional elements and school ready knowledge identified in the school readiness literature. Each item is linked with a 4-category rating rubric: 1 = "not yet," 2 = "emerging," 3 = "almost mastered," and 4 = "mastered." The scoring rubric accompanying the KSEP describes how to rate each item and how each rating option would be observed in a student. Under the rationale that full readiness for school equates to mastery, KSEP total scores are calculated by summing the total number of items a child has "mastered" (a rating of 4), thus producing a total score ranging between 0 and 16.

In addition to the 16 items, the KSEP includes response areas to gather information on student's home language, health issues (e.g., glasses, medications, allergies), and special concerns the teacher may have (e.g., attendance). Teachers also report if the child has an Individualized Education Plan (IEP) and whether the IEP is active or inactive, if the child's speech is articulate, if the child usually appears rested and nourished, and if the child is independent or needs assistance in toileting and self-help. In the context of this study, during the three-week observation period children could respond to rater prompts in either English or Spanish.

Houghton-Mifflin Reading Lions. The district uses the Houghton-Mifflin Reading Lions curriculum at all elementary grade levels to teach reading/language arts. Each grade level reading program includes a series of themes, and each theme includes a set of assessments that are used to evaluate students' reading skills. In grades 1 and 2, curriculum-based assessments evaluate students' reading skill development in the area of reading fluency, which is scored as the average number of words read correctly per minute (WPM) across two fluency probes.

Standardized Testing and Reporting. The Standardized Testing and Reporting (STAR) series of California Standards Tests is administered annually to California public school students beginning in the spring of grade 2. STAR assessments include English-Language Arts and Mathematics components and all items are multiple choice. The standardized tests were developed specifically to assess students' performance on California's Academic Content Standards and were adopted by the California State Board of Education to specify what all California children are expected to know and be able to do in each grade or course (California Department of Education, 2008).

Procedure

Data collected for this study included results from the KSEP school readiness screener, which was administered to all participating students upon kindergarten entry. In addition, reading skills data were collected periodically throughout each academic year in alignment with the Reading Lions curriculum. In this study, the reading fluency scores for the first (fall), mid-year (winter), and last (spring) themes in grades 1 and 2 were used. Finally, STAR reading data were collected from all participating 2005-2006 cohort students in May 2008—at the end of grade 2. All data were collected by district personnel as part of general education practices and shared with researchers as part of a collaborative effort to better understand the psychometric capabilities of the district-developed KSEP, and to better determine the readiness of the district's students at school entry.

RESULTS

Psychometric Functioning of the KSEP

KSEP dimensionality. KSEP items rated as 4 (mastered) were recoded as 1 and otherwise items were coded as 0. This recoding was done for two primary reasons. First, the level 1 rating "not yet" was used only for the few children who had developmental delays. Second, although KSEP uses a 4-point rubric to provide teachers with a range of rating options, its primary purpose is to evaluate "full readiness" for school. Hence, the number of items that teachers rate at the mastered level is the primary index of interest. In addition, for scales with constricted ranges, it is appropriate to examine construct validity using full-information factor analyses (principal components procedure using SAS) with varimax rotation. This analysis method was selected because of its suitability for binary data (Bock, Gibbons, & Muraki, 1988; Embretson & Reise, 2000). Scale dimensionality was evaluated for one-, two-, and three-factor solutions. Based on the results from these analyses, the one-factor solution was determined to be the best fit for these data because all items had substantial loadings (.48–.88) on the first factor with the exception of Item 16 (.19; number shapes, see Appendix). Six items double loaded on both factors in the two-factor solution, and the first factor (eigenvalue = 9.23) accounted for six times more of the explained variance than the second factor (eigenvalue = 1.50). Item 16 was retained in the scale due to its relevance to school-readiness knowledge. This analysis supports the use of the KSEP as a unidimensional measure using the total number of items rated at the mastery level (0-16) as an index of school readiness.

Internal consistency. Cronbach’s Alpha computed with the 2005-06 kindergarten cohort KSEP data found that the internal consistency was .91 (this was computed using the full one to four range for each of the KSEP items).

Predictive Validity of the KSEP

KSEP and reading fluency. A one-way, repeated-measure ANOVA was conducted to examine mean differences in reading fluency scores across grades 1 and 2 (Green & Salkind, 2005). The within-subjects factor was identified as time, defined by reading fluency for fall, winter, and spring in grades 1 and 2. The dependent variable was identified as academic achievement measured by Words per Minute (WPM) in reading fluency. The between-subjects factor was KSEP mastery level group as identified by kindergarten KSEP scores. For this analysis, the total KSEP score was used to form the following groups: 0, 1-3, 4-6, 7-9, 10-12, 13-15, and 16 to allow enough numbers per analysis cell. KSEP scores were clustered instead of using the continuous KSEP metric score as a way to provide additional meaning to total scores, the manner in which practitioners use it. WPM at each time point by KSEP group is presented in Table 1.

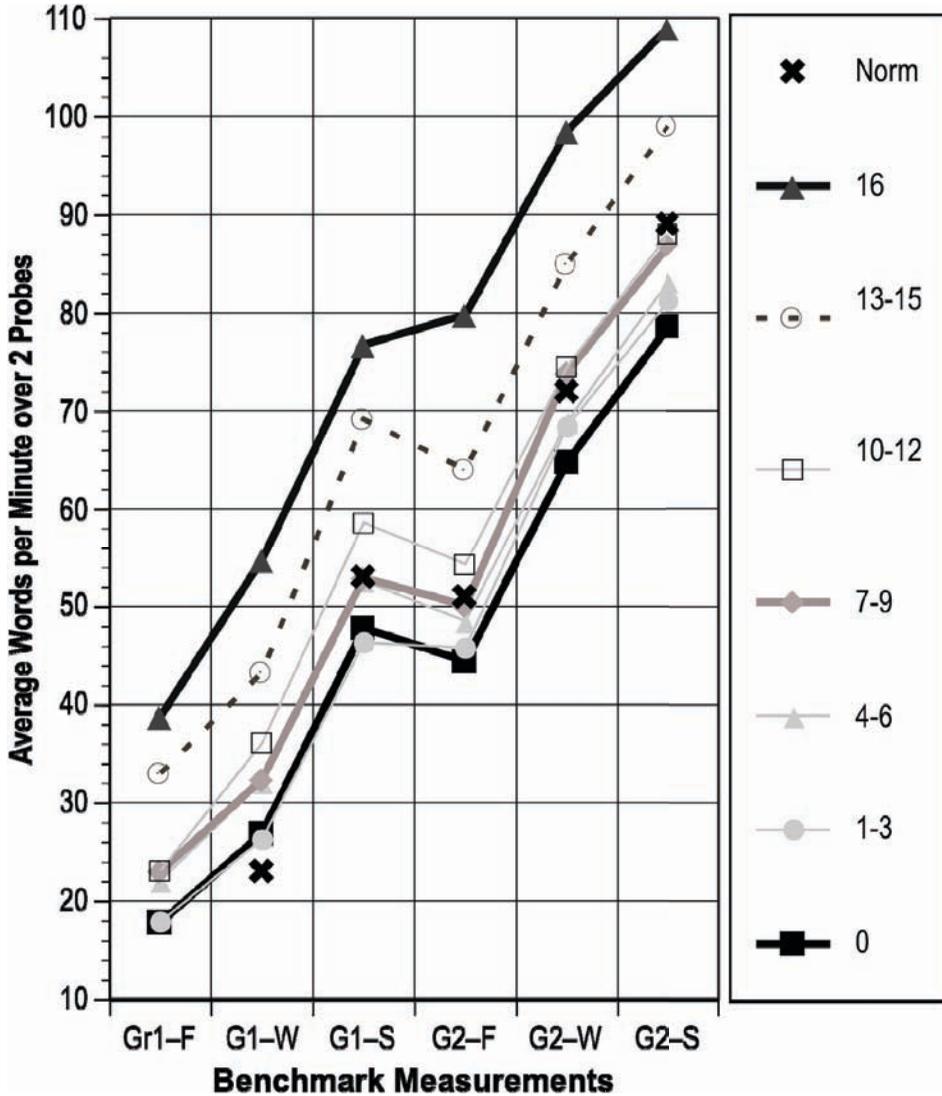
TABLE 1: *Average Reading Fluency (WPM) By Number of KSEP Items With the Full Mastery Level Rating at Kindergarten Entrance.*

Benchmark	Number of KSEP Items Mastered							Total N=671	National Norm*
	0 n=64	1-3 n=170	4-6 n=131	7-9 n=90	10-12 n=108	13-15 n=83	16 n=25		
Grade 1 Fall									
<i>M</i> (WPM)	18	18	22	23	23	33	39	23	NA
(<i>SD</i>)	(11)	(11)	(15)	(15)	(15)	(24)	(22)	(17)	(NA)
Grade 1 Winter									
<i>M</i> (WPM)	27	26	32	32	36	43	55	33	23
(<i>SD</i>)	(15)	(15)	(20)	(22)	(20)	(26)	(29)	(21)	(32)
Grade 1 Spring									
<i>M</i> (WPM)	48	46	53	53	59	69	77	55	53
(<i>SD</i>)	(23)	(22)	(27)	(27)	(28)	(31)	(29)	(27)	(39)
Grade 2 Fall									
<i>M</i> (WPM)	44	46	49	50	54	64	80	52	51
(<i>SD</i>)	(23)	(23)	(27)	(28)	(27)	(29)	(30)	(27)	(37)
Grade 2 Winter									
<i>M</i> (WPM)	65	68	69	74	76	85	99	73	72
(<i>SD</i>)	(29)	(29)	(29)	(32)	(32)	(32)	(31)	(31)	(41)
Grade 2 Spring									
<i>M</i> (WPM)	79	81	83	87	88	99	109	86	89
(<i>SD</i>)	(30)	(30)	(30)	(33)	(32)	(31)	(26)	(31)	(42)

*The norm for the average word per minute represents the 50th percentile report by Hasbrouck and Tindall (2006) for each benchmark referent time. NA = None available.

The results for the analyses using the Greenhouse-Geisser correction indicated a significant difference in reading scores across time points, $F(5, 3320) = 1733.79, p < .0001$. An interaction effect between reading scores and KSEP Mastery levels was also found indicating that the reading fluency scores across grades 1 and 2 differed by the KSEP mastery levels, $F(16.4, 3320) = 1.65, p < .048$. The nature of the interaction is displayed in Figure 1, which shows that reading fluency across all benchmark assessment periods was positively associated with the total number of KSEP items rated at the full mastery level at entry to Kindergarten. Further examination showed that, as expected, the mean WPM score increased for all groups across time.

FIGURE 1. Average Reading Fluency (WPM) by Number of KSEP Items Rated at the Full Mastery Level.



Nearly three years later at the end of grade 2, the mean WPM by KSEP mastery groups were: (0 = 79, 1-3 = 81, 4-6 = 83, 7-9 = 87, 10-12 = 88, 13-15 = 99, 16 = 109). Post-hoc comparisons using Tukey’s index revealed that the WPM scores were similar among the students with 0-12 KSEP items mastered. Students at the upper end of the mastery range, students with total mastery score between 13-16, had a significantly higher WPM scores than other students.

KSEP and STAR. As an additional check of predicative validity, kindergarten entry KSEP scores were compared with grade 2 STAR Language Arts results (due to some missing data, the *N* for this analysis was 646). A one-way analysis of variance (ANOVA) was conducted to evaluate the relation between KSEP mastery level groups and STAR Language Arts scores at the end of grade 2. The ANOVA result, $F(6, 645) = 13.08, p < .001$, revealed a significant difference for STAR scores across KSEP mastery level groups. Further examination showed that the mean STAR score increased monotonically by the number of KSEP item rated as fully mastered (0 = 316.0 [Basic], 1-3 = 322.8 [Basic], 4-6 = 333.1 [Basic], 7-9

= 337.8 [Basic], 10-12 = 340.1 [Basic], 13-15 = 363.6 [Proficient], 16 = 381.5 [Proficient]). Post-hoc comparisons using Tukey's index revealed that the STAR scores were similar among the students with 0-9 KSEP items mastered. In addition, students with 0 KSEP items mastered had significantly lower STAR scores than students with KSEP scores between 10-16. Finally, at the upper end of the mastery range, students at the 10-12 mastery level had a significantly lower STAR score than those students with a KSEP mastery score of 16.

DISCUSSION

School readiness is a critical indicator of future academic success (Pianta, 2007). Cognitive, social-emotional, behavioral, and physical competence are key components that influence a child's readiness for school, laying the foundation for subsequent academic achievement. With increased awareness of the importance of school readiness, interest in its assessment has also increased. One way to evaluate school readiness is through a universal screening process.

The results of this study indicate that the number of KSEP scores rated at Kindergarten entry as fully mastered was moderately correlated with reading fluency across grades 1 and 2 and the English-Language Arts portion of the grade 2 STAR assessment. The only students to consistently exceed the fluency WPM national norm criterion and to achieve a "Proficient" score on the STAR English-Language Arts tests were the students who had a full mastery rating on 13 or more of the KSEP items. This result has several practical implications. First, only a small proportion (17%) of the students in this district had total KSEP mastery scores of 13 or higher, which reinforces the findings of other research substantiating the great need for early intervention in child development and preschool programs to bolster the competencies of all children, particularly those from less advantaged backgrounds (Magnuson, Meyers, Ruhm, & Waldfogel, 2004). However, the results from this study generalize only to school districts with primarily Hispanic students and with a majority of English Language Learners.

Second, not all students who had low KSEP ratings were below the threshold benchmark scores of 89 WPM at the end of grade 2. School psychologists need to be mindful that there is substantial variance in fluency measures (e.g., using the WPM norms provided by Hasbrouck and Tindall [2006], the 50th percentile for spring grade 2 is 89 WPM, however, the standard deviation is 43) and some students who had low KSEP scores later performed well. There is a need for additional research to better understand the factors associated with these students who exhibit such academic resilience.

Third, the KSEP could be used as part of a multi-gating assessment process and, in such a context, the KSEP would serve as a first level universal screener of all entering kindergarten students, as implemented by the school district participating in the present study. For example, using the distribution found in this study, the participating district considers students as falling into three broad KSEP total mastery categories: 0-6 (high-risk), 7-12 (monitor), and 13-16 (enrich). The district then seeks to provide early prevention services for the high-risk students, to carefully track the academic progress of the students in the monitor group, and to provide enriching educational opportunities for the students with the highest KSEP scores. The district participating in this study examines the distribution of KSEP scores annually to verify that these broad decision thresholds continue to be meaningful. Whether these specific ranges generalize to other districts is a matter of empirical verification; hence, we recommend that all districts using the KSEP examine the distribution of local KSEP scores when implemented. In addition, prudence suggests that additional assessment and monitoring be considered for those students who receive low KSEP scores. For example, one school district using the KSEP provides second-level targeted assessment using the Behavioral and Emotional Screen System (Kamphaus & Reynolds, 2007), the Peabody Picture Vocabulary Test (Dunn & Dunn, 2007), the DIBELS Initial Sound Fluency and Letter Naming Fluency (DIBELS, 2009), and the Number Knowledge Test (Magnuson et al., 2004; Okamoto & Case, 1996).

Fourth, whether it is the KSEP or any other school readiness instrument, there is a need to have a discussion to develop a shared consensus about what the term "school readiness" means in practical terms. Although any assessment of the social-emotional, numeracy, and literacy competencies of entering kin-

dergarten students will produce a distribution of ratings, the interpretation of these ratings requires both an empirical analysis (e.g., mean and variance of scores obtained) and an aspirational analysis (e.g., defining the competencies that a school/community wants their children to acquire by the time they enter school). Based in part on the results of the present study, for example, the broader community in which the participating district is located acknowledged that the vast majority of entering kindergarteners had acquired some readiness competencies; however, many students had competency gaps and these gaps were associated with diminished academic performance as much as three years later. In this instance, the aspirational dialogue led to the observation that it may not be fruitful to think of a child as being a little ready or almost ready. If the goal is to increase the odds of academic success for all students, then children are either ready, or not, and the goal should be to help all children be fully ready for school.

Study Limitations

Although the results from the current study are promising and provide support for the continued use of the KSEP as a universal school readiness screener, there are limitations to consider regarding the population, the data, and the outcomes that may speak to future analyses. To begin, the district in this study has a fairly homogeneous population of primarily Hispanic, English Language Learners, and a high percentage of free/reduced price lunch participants, indicating a low socioeconomic demographic. To determine generalizability of findings to other demographics, a similar study could be conducted with students of other demographics or with a less homogeneous population.

Another identified limitation involves the inability to track student attendance over time. This is of importance considering the nature of students and families in the participating school district. At the present time, it is impossible to identify if missing student data (e.g., reading fluency probe information for fall, winter, or spring) is a result of students not being tested because they were absent or because they was not enrolled at the time. Lack of instructional opportunity resulting from chronic absenteeism or family mobility may affect academic performance, which could, in turn, alter the relationship between school readiness and academic achievement. It would be of interest to track student attendance in conjunction with the KSEP scores and academic indicators as a way to better understand the confounding influence of attendance.

Conclusion

Despite the limitations of the present study, the results of the preliminary psychometric analyses identified promising results. Although there is still much that could be done to better understand the nature of the KSEP and its relation with later academic achievement, the KSEP has promise because it provides teachers information about the nature of the readiness of students entering kindergarten when used as part of a greater kindergarten articulation effort. Research continues to highlight the importance of school readiness, and the KSEP provides one method of bringing awareness about student competencies at school entry to the forefront and to prompt early intervention for students in need.

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APPENDIX

Kindergarten Student Entrance Profile (KSEP) Rubric Content Areas

Rubric Rating Categories: 1 = Not Yet, 2 = Emerging, 3 = Almost Mastered, 4 = Mastered

1. Seeks adult help when appropriate.
2. Engages in cooperative play activities with peers.
3. Exhibits impulse control and self-regulation.
4. Stays with or repeats a task.
5. Separates appropriately from caregiver most days.
6. Is enthusiastic and curious in approaching new activities.
7. Follows rules when participating in routine activities.
8. Uses tools with increasing precision.
9. Demonstrates general coordination.
10. Demonstrates sense of his or her own body in relation to others.
11. Recognizes own name.
12. Writes own name.
13. Demonstrates expressive abilities.
14. Understands that numbers represent quantity.
15. Recognizes colors (circle all that apply: red, yellow, green, blue, orange, purple, brown, black, pink, white, gray).
16. Recognizes primary shapes (circle all that apply): square, circle, triangle, rectangle.

Note. Contact the authors for KSEP materials (see also this website: <http://web.me.com/michaelfurlong>). Each item has associate rubrics for the four rating categories. An example of the full Mastery level description for the item, “Understands that numbers represent quantity (e.g., can get three apples out of the box; asks for two more crackers; can put out one napkin for each child)” is: *Selects an accurate amount of items upon request up to at least 10 items. Example: Give me ten blocks.*