

Kindergarten Screening: What Results Are We Getting?



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Keywords

*Kindergarten, Screening, Early
Childhood, Assessment, Reading*

Abstract

Kindergarten students in the United States have been screened prior to school entry for more than fifty years. While this initial school assessment was once done as a means of identifying students with special needs, it is now more commonly used as both a planning and placement tool. My research sought to determine whether the results of the Kindergarten screening test used at my school correlated with later academic success in reading. A positive correlation between the Kindergarten screening results and the end of the kindergarten year reading achievement test could lead to earlier interventions to prevent future reading difficulties.

Forty-three participants' Kindergarten screening and reading achievement data was collected and analyzed over the course of two years. The total score of the Kindergarten screening results, not a single sub-test, showed the most significant, positive correlation with the reading achievement assessment.

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Significance

As recently as the 1980s, kindergarten classrooms had neither the same physical appearance nor the same daily agenda that exists today within our twenty-first century educational structures. Kindergarten teachers used to patiently encourage socialization, spark dramatic play, assist with cooperative behaviors, and teach basic school readiness skills. During the 1980s and 1990s, Kindergarten teachers had to shift their focus from an emphasis on learning through play into an academic curriculum. The most radical shift happened in 2001 with the passing of the No Child Left Behind Act which mandated that all children needed to be able to read at grade level by the end of third grade. This was to be measured through the use of state and local standardized testing (U.S. Department of Education, 2002). As a Kindergarten teacher, I have determined that the importance of beginning kindergarten with a solid foundation has become critical. The developmental skills that used to be the core component of the kindergarten curriculum are now expected to be taught in preschool (Agostin & Bain, 1997).

Each spring my elementary school, along with thousands of others nationwide, participates in a one day multifaceted assessment of our incoming class— commonly known as Kindergarten screening. The results of this event are designed to give the school administrators and teachers a snapshot view of the skills and abilities of the entering class of Kindergarteners. The information gathered from these assessments has been useful for lesson planning and preparations at the beginning of the school year, but I was curious to see if the results could give me more insight. With the current expectation that Kindergarteners be able to read by the end of the school year, I wanted to discover if the results helped to identify students who would need additional assistance in learning how to read from the onset.

The purpose of this research study is to determine if there is a correlation between the results of the Kindergarten screening assessment and future academic success, specifically in the area of reading achievement. A positive correlation could lead to a more individualized approach in the teaching of literacy. It would also present the ability to target at-risk learners, those liable to experience difficulties, from the beginning days of their formal education. As the number of states mandating pre-kindergarten testing continues to grow, it is essential to make sure that the results of these assessments are being fully utilized to best help the students.

Literature Review

What is Kindergarten Screening?

Students in the United States have participated in academic screening prior to entering kindergarten or first grade for over 60 years. The original intent of the assessment was to identify children with learning disabilities so as to provide essential early interventions as soon as possible (Gredler, 1997). In a longitudinal study of 54 students from first

through fourth grade Juel (1988, p. 440) found “the probability that a child would remain a poor reader at the end of fourth grade, if the child was a poor reader at the end of first grade was .88” if no interventions were made. This research validated the belief that reading disabilities needed to be caught early on so that appropriate interventions can be put in place prior to the start of first grade in order to decrease the chances of failure or retention (Crail & Fraas, 1991; Hillerich, 1975; Velluntino, Scanlon, Zhang, & Schatschneider, 2008).

Since the 1940s, the focus of the screening tests has shifted from searching for at-risk students—those likely to struggle academically, to determining a child’s school readiness. Readiness is defined as possessing the entry skills believed to be predictive of long-term school success (Kurdek & Sinclair, 2001). The students are usually assessed for such abilities in the following areas: cognitive, language, motor, ability to copy or repeat and conceptual development (Gredler, 1997). While some schools only screen for readiness, others use a developmental screening tool in place of or



in addition to the readiness test. Panter and Bracken believe that “the developmental assessment considers the child’s potential to acquire new skills” (2009, p. 397) rather than how accomplished the child is in a particular skill. It is important for administrators to consider the specific outcomes they are looking for when choosing a screening tool. After analyzing three readiness tests and two developmental screening tools, Gredler (1997), concluded that there were several overlapping skill areas being assessed. However, developmental and readiness tests are designed for different purposes and thus the results should not be treated in the same manner.

Kindergarten screening tests typically occur in the spring or summer prior to school entry. The assessments are generally administered one-on-one by kindergarten teachers, speech pathologists, school nurses, and administrators. The data recorded by the Early Childhood Longitudinal Study, Kindergarten Class of 1998-1999 showed that 61 percent of schools gave an entrance test prior to kindergarten nationwide (Prakash, West, & Denton, 2003). Students are asked to demonstrate a variety of developmental and readiness skills such as: letter identification, number identification, gross motor skills, answering basic information questions, drawing basic figures, writing their names, and phonemic awareness (Costenbader, Rohrer, & DiFonzo, 2000). School district administrators will often use the results of either type of assessment as a means to support the recommendation for delayed entry, waiting a year to begin kindergarten. The National Association for the Education of Young Children (NAEYC, 2000) holds the position that using the scores alone to determine a child’s placement into kindergarten is unacceptable. NAEYC holds that the only barrier to entry should be age eligibility. This practice of red-shirting Kindergartners, or purposefully choosing to postpone school

entrance for a year, is likely to be keeping out the very students who need to be in the classroom the most (Carlton & Winsler, 1999). Delaying kindergarten entry can cause a negative effect on the parents as well as the child bringing about feelings of shock, anger, and depression (Gredler, 1997). While unfortunately the concept of placement is the main objective of the assessment for school administrators, the Kindergarten teachers are more likely to be using the results as a guide for instructional planning. However, this one-day, one-time test may not be providing the teacher with the most accurate set of results.

Implications in Screening Young Children

Preschool age children are taught not to talk to strangers and yet during the screening assessments they are being asked to speak with several strange adults determining their future over the course of the next thirty minutes. Concern is continually voiced that this form of assessment is neither developmentally appropriate nor a true measure of skill. It



is recommended that the child be screened in a comfortable, known setting in order to see the student's true abilities and have less of a focus on an experience with an unknown adult (Bordignon & Lam, 2004). Low scores on the Kindergarten readiness test could be attributed to any number of causes not related to lack of intelligence including: lack of experience, shyness, anxiety, impulsivity, avoidance, or inattentiveness (Bordignon and Lam, 2004). The screening test may be biased against certain students before it even begins based on their ethnicity, low socioeconomic status, physical disabilities, or limited knowledge of English (Carlton & Winsler, 1999). This holds especially true if the assessment was formulated by using a "norming population [that] was primarily composed of white, middle-class children" (Bordignon & Lam, 2004, p.742). It is

essential that districts make sure the instruments they choose for Kindergarten screening are standardized, reliable, easy to administer, affordable, and valid for their population in order to secure the best outcomes (Augustyniak, Cook-Cottone, & Calabrese, 2004). Administrators and teachers need to know their clients and speak to parents to obtain the highest level of accuracy possible from the screening assessment.

Why screen for readiness?

With the myriad concerns regarding the validity of Kindergarten screening, it is a wonder that schools choose to continue screening students at all. Agostin and Bain (1997, p. 219) found that "several recent studies, however, have supported the notion that pre-screening techniques accurately predict future academic performance." For my analysis I focused on what had been researched in regards to predicting future reading achievement and difficulties from the Kindergarten screening results. Morris, Bloodgood, and Perney (2003) set out to discover what kindergarten pre-reading skills were the best predictors of future success in reading in the first and second grade. The educational researchers assessed 102 Kindergarten students in rural North Carolina on six pre-reading skills of alphabet letter identification, consonant sound awareness, concept of words, spelling beginning and ending sounds, phoneme segmentation, and word recognition. The results

suggested that at the beginning and middle of kindergarten alphabet letter identification was the single best predictor of reading success in first grade. These results correlated with the findings of several other similar research studies (Busch, 1980; Catts, Fey, Zhang, & Tomblin, 2001.; Kurdek & Sinclair, 2001; Scanlon & Vellutino, 1996; Schatschneider, Fletcher, Francis, Carlson, & Foorman, 2004). It is important to note that only Scanlon and Velluntino (1996) included students for whom English was not a second language. No other studies mention this crucial characteristic about their participants.

In 2003, Bishop researched 103 Florida Kindergarten students' screenings and found similar results with letter identification being the primary predictor of reading success. Bishop further investigated whether a significant difference existed between the fall screening data and the winter screening data. The assumption was that a Kindergartener who had been in school for four to five months should have made academic gains. Was letter identification still a good indicator mid-year? The data suggested that the accuracy of letter identification as the predicting factor at the fall screening (65%) was nearly as valid as at the winter screening (73%). Confirming Bishop's findings, a research study on the timing of the screening for reading risk showed only a .1% difference between the results of the fall versus the winter kindergarten reading assessments (Santi, York, Foorman, and Francis, 2009). Badian (1982) found that testing children six months before the start of kindergarten was no less accurate (92%) than waiting to test children at five or six years old. This would support the idea that early screening for difficulties in reading can be beneficial to the student provided interventions are put in place as a result.

Bishop joined with League (2006) and decided to follow-up on the Floridian Kindergarten participants to test the results for longevity in predicting academic achievement in reading. At the end of first grade, letter identification was out ranked by phonological awareness, understanding the correlating sounds for letters, as the most significant predictor of reading achievement. This longitudinal research study indicates that the predictors of reading achievement evolve over time. Schatschneider, Fletcher, Francis, Carlson, & Foorman (2004) also found that phonological awareness was more predictive at the end of kindergarten. Both studies attribute this change to the growing structure of reading as well as two years worth of phonics instruction. This change in findings at the end of the kindergarten school year was also visible in other research studies which found that concept of word and word recognition (Morris, Bloodgood, & Perney, 2003) and the speed of naming the letters (Speece, Mills, Ritchey, Hillman, 2003) were more precise predictors. In a reverse study, Catts, Fey, Zhang, and Tomblin (2001) noted that second graders with reading difficulties were four to five times more likely to have had low scores in phonological awareness and letter naming than their on-level peers. Students who experience difficulties in kindergarten basic reading skills are likely to continue to have trouble with future reading success.



Summary of Findings

Kindergarten and readiness screening have progressed in their formats over the past several decades in regards to the new expectations for Kindergarteners. Learning through play has been largely reserved for preschoolers while Kindergarteners are expected to perform at a much more advanced academic level than was ever previously expected. As a result of the new higher level of standards, readiness screening has evolved into a form of high-stakes testing for five year-olds. Entrance to kindergarten or placement in a certain group is often dependent on the results of this examination. Although there is an increased amount of pressure placed on the students taking these tests, research has shown that how a student performs at the beginning of kindergarten can be predictive of future academic success— particularly in the area of reading.

Context

I am a Kindergarten teacher at a suburban parochial school in Columbus, Ohio. The school is primarily privately funded by traditional tuition paying families; however, it also accepts qualified EdChoice state vouchers. The school has a very diverse population with almost 40% minority student enrollment. Most students initially enter the school at the kindergarten or sixth grade level. The school has one class per grade from kindergarten to eighth grade. It also has a part-time preschool program that several of our future Kindergarteners have attended. The average class size for kindergarten through eighth grade is about thirty students. The Kindergarten program is all day every day, but the students are separated into two instructional groups (about 15 students each). One group is with me in the morning and one in the afternoon. When the group is not in the kindergarten room, they work on enrichment activities with my full-time aide in the classroom next door and attend their special classes— art, gym, library, and music. Similar to a traditional half-day program, I teach both groups the same lessons daily, but with almost no interruptions during our instructional time.

As we have only one class per grade, I am the whole Kindergarten department and do not have another grade-level teammate. Most often I collaborate with the first grade teacher in order to tweak thematic units to meet observed deficiencies from year to year. As a result of the need to get Kindergarteners started in reading prior to first grade, I wanted to learn if it would be possible to predict children who are likely to have difficulties in learning how to read. In addition to my classroom duties, I organize and head the annual spring Kindergarten screening program at my school. I wanted to learn if there was a positive correlation between the Kindergarten screening results and the end of the year reading level.

Methods

Participants

Since not every child who attends Kindergarten screening decides to attend our private school, two years worth of participants were necessary in order to get an appropriate sample size. The participants consisted of 43 children who were screened the spring prior to their entrance into kindergarten and later tested at the end of their kindergarten year on reading skills. The sample consisted of 40% female students and 37% minority students. Seven of the participants (16%) are from households in which English is a second language. The participants' ages at the time of the Kindergarten screening assessment ranged from four years six months to five years seven months. The average age was five years one month.

Kindergarten Readiness Test

In the spring prior to kindergarten entry, the Kindergarten Diagnostic Instrument Second Edition (KDI-2) was administered to each child individually by various school personnel including: the Kindergarten teacher (myself), the school principal, teacher aides, the physical education teacher, the speech pathologist, a reading tutor, and the school nurse. The test is designed to be completed with students who are four to six years old. This version of the KDI test is computer scored so that the newest normative data can be readily applied. The KDI-2 used the results of ten research studies to redevelop and improve upon the original version (Miller, 2000). For this assessment students visited eight stations in approximately 35 minutes to complete the thirteen subtests of the 200 item test. The KDI-2 consists of the following sections as shown in Table 1 below.

Test Section	Description of Tasks
Body Awareness	Drawing a picture of a person with body parts
Concept Mastery	Displaying knowledge of basic concepts such as left/right
Form/Letter Identification	Identifying basic shapes (ie. circle) and fifteen upper and lowercase letters
General Information	Answering questions about facts preschoolers are typically exposed to such as "What is ice when it melts?"
Gross Motor Skills	Performing skills related to physical coordination such as jumping, skipping, hopping, catching, etc.
Memory for Sentences	Recalling words/sentences of increasing length in order
Number Skills	Displaying basic mathematics concepts such as counting to ten
Phonemic Awareness	Answering cues with a logical completing rhyme such as "The light is very ___."
Verbal Associations	Relating to verbal reasoning skills such as "Coffee is hot, ice cream is ___."
Visual Discrimination	Perceiving similarities and differences in various shapes
Visual Memory	Recalling previously observed shapes, letters, or words
Visual-Motor Integration	Demonstrating fine motor skills by drawing increasingly complex shapes
Vocabulary	Knowing specific words such as "What is a pencil?"

Table 1. Elements of the KDI-2 Kindergarten Screening Assessment

Kindergarten Reading Achievement Test

At the end of their kindergarten year, all students take Renaissance Learning's™ STAR Early Literacy test in order to assess their reading skills prior to entry into first grade. It is a computer-based test that is taken individually for students in grades preschool through third. It has undergone over fifteen independent research studies and is continually updated with new normative statistical data through internet resources. STAR Early Literacy has been compared to and exceeded in accuracy of results several similar style assessments such as the DIBELS, Dynamic Indicators of Basic Early Literacy Skills (Hogan, McBride, Milone, Shakrani, & Ysseldyke, 2010).

At my school, the students take the test one-on-one with a reading tutor. This allows for assistance with any technical computer difficulties (such as using the mouse to answer the questions) as well as providing a quiet working environment. The test format is both auditory and visual consisting of seven literacy skill areas. The reading skills being assessed by STAR Early Literacy are shown below in Table 2.

Reading Skill	Example of Task
General Readiness	Identifying letters
Graphophonemic Knowledge	Recognizing letter sounds
Phonemic Awareness	Blending sounds to make words
Comprehension	Understanding words, sentences, and paragraphs
Phonics	Identifying short vowel sounds
Vocabulary	Identifying antonyms and synonyms Matching words and pictures
Structural Analysis	Finding and building words

Table 2. STAR Early Literacy Assessment Components

An overall reading literacy classification is determined from the seven skill sections. The classification types are: Early Emergent Reader, Late Emergent Reader, Transitional Reader, and Probable Reader. When the Kindergarten students are assessed in May, the majority of them fall in the Transitional Reader category.

Procedures

A correlation test was run between the thirteen subtest scores as well as the total score of the KDI-2 screening assessment and the total score of the STAR Early Literacy exam in order to find if a positive correlation was present among the forty-three participants' data.

Findings

After running correlations between the KDI-2 subtests and the STAR Early Literacy total test score, a positive correlation was found with all thirteen KDI-2 subtests as well as the total KDI-2 test score. As this research included 43 participants, Pearson's Correlation Coefficient Table shows that when the degrees of freedom are 40, correlations greater than .490 are considered statistically significant at the .9995 level. The total score of the KDI-2 screening assessment, not one of the thirteen subtests, had the strongest correlation with the STAR Early Literacy test at 0.73 as shown in Table 3 below.

KDI-2 Test Section	Correlation Coefficient
KDI-2 Total Test Score	0.72958
Body Awareness	0.498804
Concept Mastery	0.422463
Form/Letter Identification	0.501053
General Information	0.55937
Gross Motor Skills	0.317826
Memory for Sentences	0.628522
Number Skills	0.494856
Phonemic Awareness	0.489241
Verbal Associations	0.675731
Visual Discrimination	0.588979
Visual Memory	0.48276
Visual-Motor Integration	0.378345
Vocabulary	0.503452

Table 3. Correlation of KDI-2 Subtests and STAR Early Literacy Test

The two highest contributing KDI-2 subtests in regards to their correlation were Memory for Sentences and Verbal Associations. The KDI-2 subtests of Body Awareness, Form/Letter Identification, Number Skills, General Information, Visual Discrimination, and Vocabulary are also statistically significant as their correlations are greater than .490. As suggested by the data, the KDI-2 subtests of Concept Mastery, Gross Motor Skills, Phonemic Awareness, Visual Memory, and Visual-Motor Integration do not have a strong correlation with the STAR Early Literacy test.

My findings did not follow along with the literature I had read. I was extremely surprised to learn that it was the total score of the KDI-2 assessment that had the highest correlation with the STAR Early Literacy test score. I had expected to see the subtest of Form/Letter Identification have the highest correlation based on its predominance in the research studies I encountered. I was not sure why letter identification did not have a higher correlation in my study. I speculated it may have had to do with my higher than average ESL population. Almost all of my outlying data points were from students who fell into

this category. Also the normative data to which my students were compared consisted of predominately Caucasian, English-speaking children (Miller, 2000).

I decided to run a new correlation with the KDI-2 total scores and subtests and the STAR Early Literacy results that excluded students who were known to be ESL to see if there were any significant differences in the results. While most of the KDI-2 subtests stayed at relatively the same correlation, there were a few noticeable differences. As this second correlation test only included 34 participants, Pearson's Correlation Coefficient Table shows that when the degrees of freedom are 30, correlations greater than .554 are considered statistically significant at the .9995 level. The KDI-2 subtest of Form/Letter Identification increased its correlation value from 0.50 to 0.59 when ESL student data was removed. The correlation with Number Skills decreased as it moved from 0.49 to 0.39 and the correlation Visual Memory increased as it changed from 0.48 and 0.56 as shown highlighted in Table 4 below.

KDI-2 Test Section	All Participants Correlation Coefficient	Non-ESL Participants Correlation Coefficient
KDI-2 Total Test Score	0.72958	0.73204
Body Awareness	0.498804	0.509457
Concept Mastery	0.422463	0.445426
Form/Letter Identification	0.501053	0.590419
General Information	0.55937	0.573791
Gross Motor Skills	0.317826	0.225165
Memory for Sentences	0.628522	0.623239
Number Skills	0.494856	0.389315
Phonemic Awareness	0.489241	0.50517
Verbal Associations	0.675731	0.683993
Visual Discrimination	0.588979	0.572777
Visual Memory	0.48276	0.560527
Visual-Motor Integration	0.378345	0.356436
Vocabulary	0.503452	0.504598

Table 4. Correlation of KDI-2 Subtests with All Participants and Only English Speaking Participants and STAR Early Literacy Test

Also of note is that Gross Motor Skills, which already had the lowest correlation value, dropped even further from 0.32 to 0.23 when only English speaking students' data was included. These results are more in line with the literature, but still leave concern as to why Form/Letter Identification was not the primary correlating subtest.

I had to critically analyze my assessment materials to consider why the two KDI-2 subtests of Memory for Sentences and Verbal Associations had the highest correlation

with the STAR Early Literacy scores regardless of whether or not the ESL students' data was included. As these two subtests did not match the findings of similar studies I came across in my literature review, I had difficulty in deciphering how they ranked so highly. It was upon a more careful consideration of the style and format of the STAR Early Literacy test that I came to some conclusions. As the STAR Early Literacy assessment is taken on the computer, it has the ease of advancing the test-taker to a more difficult task depending on how the questions are answered. For example, if the student gets five alphabet identification questions correct, the test will move on to a more complex skill. The KDI-2 subtests of Memory for Sentences and Verbal Associations require greater critical thinking skills than simply naming letters or numbers. It is likely that these two subtests best correlate with the types of thinking necessary for doing well on the STAR Early Literacy assessment.

Conclusions

As an educator, I must constantly seek out the best methods of instruction and assessment in order to provide the highest quality educational experience. It is necessary to remember that when working with non-reading, non-writing young children alternate forms of traditional assessment techniques are required so as to best gauge their abilities. In my research, I was hoping to find a correlation from the Kindergarten screening data so that I would be able to better identify students who would most benefit from reading interventions from the onset of their schooling. I have found in my classroom that the earlier reading interventions are started with a child, the more quickly and likely that child is to make grade level expectations and standards. In early childhood classrooms, timely interventions are critical to promoting success in young students.

Future Research

Something that I had not previously considered was how much of the KDI-2 assessment was given verbally. When you compare a student who only knows English to another student who only knows Spanish on a primarily verbal assessment given in English, the student who has the advantage is clear. Only one of the research studies that I came across acknowledged that it included students who did not speak English as a first language. I would recommend that future research extend upon the idea of gathering more authentic information from early childhood students who would be considered ESL. If possible, the Kindergarten screening assessment should be given two times—the first time in the child's home language and the second in English. The native language assessment would provide the standard Kindergarten screening results to be used by the school. The English Kindergarten screening assessment would give the teacher a measurement of the child's comprehension of the English language by providing a direct comparison. I have found that most children at this age typically manage to learn a second language (English) very quickly, but there are always some who will have difficulties. That is why teachers need to keep searching until they find what methods work best for each student.

Based on the results of this study, the total score of the KDI-2 Kindergarten screening assessment did positively correlate with the results of the STAR Early Literacy reading achievement test. Now knowing that the KDI-2 total score so closely relates to the STAR Early Literacy test, I can use this knowledge to better assist me in analyzing the Kindergarten screening data for classroom and individual student lesson planning in order to provide the best tools for reading success. It will allow me to better help students throughout the implementation of early reading interventions.

For my incoming Kindergarten students who do not score well on the KDI-2 screening assessment, the first task to undertake would be to interview the parents. The parents would be able to provide essential background information on the Kindergartener as well elaborate upon the child's comprehension of literacy skills. If the Kindergartener did not understand the screening assessment as a result of not being familiar enough with the English language, the child would need to be retested on their literacy skills at regular intervals throughout the school year. This would allow the child time to be exposed to regular, daily use of English in a whole language environment. However, if it is determined that the Kindergartener did not do well on the assessment because of a deficiency in literacy skills, it would be more appropriate to provide this child with small group intervention instruction. This should be done for both English language learners as well as native English speaking students who lack essential pre-reading skills. The variegated grouping will offer the English language learners additional social practice opportunities while keeping them integrated with their classmates. The small group intervention instruction will afford the Kindergarteners who scored low on the KDI-2 screening assessment the chance to have the same equal access to reading as their better prepared peers.

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