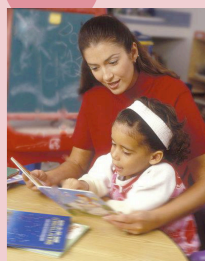# Preschool Early Literacy Indicators (PELI): Initial Reliability and Validity

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Introduction

Early childhood research provides sound evidence that the foundations of literacy are established prior to children entering elementary school (e.g., Cadima, McWilliam, & Leal, 2009). Given the recent emphasis on research-based reading instruction and the need to help students develop literacy skills as early as possible in their education, researcher have begun to look at the need for a responsive system of early literacy education in preschool (Greenwood et al., 2011). Within a responsive, outcomes-driven model of early literacy and language instruction, early childhood educators require an assessment tool to universally screen students and identify those that may need additional support acquiring early literacy and language skills. An appropriate tool should also work to monitor progress of students receiving intervention. The Preschool Early Literacy Indicator (PELI) is an experimental measure that has been developed for use in an Outcomes-Driven model of early education to universally screen all students in preschool programs, progress monitor students identified as needing intervention, and inform individual and system-wide instructional practices.

The PELI is comprised of test items assessing four early literacy subskills: Alphabet Knowledge, Phonemic Awareness, Vocabulary and Oral Language, and Comprehension. These skills were chosen based on research showing these early literacy skills are important foundational pre-reading skills as well as developmentally appropriate instructional themes (Neuman & Carta, 2011; Lonigan & Shanahan, 2009). All test items are presented in a storybook format that centers around a central theme that also reflects the story portion of the assessment (e.g., On the Farm, What's for Dinner?). The storybook format is designed to be familiar and comfortable for the child, and includes print awareness components recognizable to many young children, such as authors names, page numbers, a cover, and a title page. Suggested wording is given for all test items, however the instructions are not required to be said verbatim given the need for assessors to adjust their language and expectations to young children's developmental level and be responsive to child behavior and needs (Sandall, McLean, & Smith, 2000).

The PELI has been piloted with preschool-aged children from 2.5 to 6 years of age. Administration time is between 5 and 12 minutes.

Purpose and Research Questions

The purpose of this study was to examine the reliability and validity of the PELI. The research questions were: (1) What is the alternate-form reliability for the PELI?; (2) What is the inter-rater reliability of the PELI? (3) What is the concurrent criterion-criterion related validity of the PELI with other early literacy screening assessments and standardized measures of early reading skills?
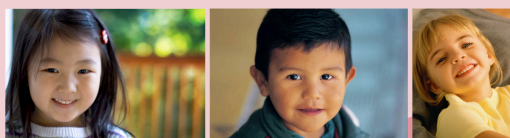
Method

Participants

The research questions were answered by two separate studies. For the reliability study, all 3- and 4-year-old students enrolled in two preschool programs in the Pacific Northwest were invited to participate. Both sites were private preschool programs; one was also a community placement for Head Start qualified students. For the validity study, 107 4- and 5-year-old students enrolled in Head Start programs in the Pacific Northwest participated. Data were collected during the 2009-2010 school year. In both studies, students received English-language instruction, including instruction of pre-reading skills. The study populations included children with disabilities and English language learners.

Measure and Procedures

Experimental Measure: PELI
The experimental Preschool Early Literacy Indicator is an untimed measure that assesses four foundational early literacy skills. Each skill is assessed using multiple methods in order to be sensitive to developing skills.
Alphabet Knowledge. During the Alphabet Knowledge (AK) section, children are asked to identify as many upper-case letters as possible on a page that includes all 26 letters in random order. Students naming at least 16 letters are also shown a similar page of lower-case letters. Letters are printed in an early reader font.
Phonemic Awareness. Two strategies are used assess phonological awareness on the PELI. Both tasks assess the skill at the phoneme level. In the first task, students are asked to produce a "little bit" of a one-syllable word. The second task asks students to select one of three words that goes in a story after being given the first sound.
Vocabulary & Oral Language. Vocabulary and Oral Language is assessed using three strategies on the PELI. The first asks students to name pictures of common items relating to the theme of the story (i.e., fork, present, and candle for a story about a birthday party). Following completion of the picture naming task, the examiner then selects three of the words named by the student and asks him/her to tell everything he/she can about the item. In the final tasks, students are asked to retell a simple story that was read during the assessment.
Comprehension. A series of comprehension questions are asked during the administration of the PELI and are designed to capture students' ability to infer, predict, and recollect details of a simple story. Questions require a range of comprehension skills from simple (i.e., What was the story about?) to complex, (i.e., being able to guess which kind of pet a family will adopt based on their discussion of likes and dislike in the story).

Standardized Assessments of Early Reading
The validity study also utilized three standardized measures of early reading skills. The Clinical Evaluation of Language Fundamentals: Pre-K (CELF Pre-K), the Peabody Picture Vocabulary Test (PPVT), and the Test of Preschool Early Literacy (TOPEL).
Other Measures
Individual Growth and Development Indicators (IGDIs). Three IGDI subtest of phonological awareness and three subtests of vocabulary were also used in the validity study. In the Rhyming subtest, students must select the word that rhymes with a target word provided by the assessor from three options pictured on a large note card. A similar procedure is used during the Alliteration subtest, where students are asked to identify the word that starts with the same sound as the word provided. A third subtest of phonological awareness, Sound Blending, asks students to produce a word by combining two parts presented by the assessor. In the first vocabulary subtest, Which One Doesn't Belong, students identify which of three words does not belong, using knowledge of categorization to identify the correct picture. The Definitional Vocabulary subtest has students answer a forced choice question about a word pictured. The last vocabulary subtest, Picture Naming, has students give the names of pictured items.
Dynamic Indicators of Basic Early Literacy Skills (DIBELS). The final measure used during the validity study was Letter Naming Fluency (LNF), one of the DIBELS indicators. LNF is a fluency-based task where students identify as many upper- and lower-case letters printed on an 8 ½ by 11 sheet of paper as possible in one minute.
Procedures. In the reliability study, all participants were administered the five PELI forms within a two-week period. Approximately 60% of test administrations were shadow scored to calculate inter-rater reliability. All assessors were undergraduate and graduate students trained by the first author. In the validity study, students were assessed three times yearly (fall, winter, and spring) by trained data collectors as part of a federally-funded research consortium, the Center for Response to Intervention in Early Childhood (CRTIEC).

Results

Table 1: Descriptive Statistics of PELI Subtests

PELI Subtest	Beginning of year M	Beginning of year SD	Beginning of year n	Middle of year M	Middle of year SD	Middle of year n	End of year M	End of year SD	End of year n
AK	10.00	14.36	131	17.45	17.77	115	20.22	18.42	107
PA	6.86	1.88	131	7.50	1.83	115	8.11	1.90	107
Comp	8.89	4.58	131	10.24	4.36	114	9.14	3.90	107
VOL	17.04	5.17	131	19.13	5.93	114	18.74	5.23	107

Note. AK = Alphabet Knowledge, PA = Phonemic Awareness, VOL = Vocabulary/Oral Language, Comp = Comprehension.

Table 2: Inter-Rater Reliability of PELI Subtests and Total Score

PELI Subtest	Form 1 (n=22)	Form 2 (n=23)	Form 3 (n=11)	Form 4 (n=10)	Form 5 (n=10)	Overall (n=76)
AK	.99	.99	.99	.99	.99	.99
PA	.99	.99	.99	.96	.97	.99
VOL	.99	.98	.99	.97	.98	.98
Comp	.98	.99	.98	.98	.91	.98
Total	.99	.99	.99	.99	.99	.99

Note: All correlations are statistically significant at the p < .001 level.

Table 3: Alternate Form Reliability of PELI Total Score

Form	1	2	3	4	5
1	-	.91	.89	.92	.89
2		-	.94	.90	.91
3			-	.91	.91
4				-	.92
5					-

Note: Correlations are based on subjects with pair-wise complete data. All correlations are statistically significant at the p < .01 level. AK range = .96 - .99, PA range = .84 - .95, VOL range = .64 - .85, Comp range = .56 - .79. n = 32.

Table 4: Concurrent Correlations with Standardized Norm-referenced Tests of Language and Early Literacy

PELI Subtest	CELF Sentence Structure	CELF Word Structure	CELF Expressive Vocabulary	CELF Total	PPVT	TOPEL Print Knowledge	TOPEL Phonological Awareness
AK	.03† (74)	.21* (74)	.22† (74)	.19† (74)	.47 (79)	.75 (85)	.34*** (85)
PA	.63 (74)	.63 (74)	.47 (74)	.69 (74)	.39 (79)	.05† (85)	.24* (85)
Comp	.44 (74)	.67 (74)	.60 (74)	.69 (74)	.52 (79)	.44 (85)	.31*** (85)
VOL	.46 (74)	.54 (74)	.72 (74)	.68 (74)	.54 (79)	.39 (85)	.35*** (85)

Note. Correlations are based on subjects with pair-wise complete data. The number with pair-wise complete data is reported in parentheses. Unless otherwise noted, correlations are statistically significant at the p < .001 level. *** p < .005, ** p < .01, * p < .05, † Not significant.

Table 5: Concurrent Correlations with IGDIs and DIBELS LNF

PELI Subtest	Phonological Awareness Rhyming	Sound ID	Alliteration	Sound Blending	Vocabulary Definitional Vocabulary	Which one?	Picture Naming	DIBELS LNF
AK	.14†	.41	.17†	.19†	.29	.19*	.20*	.84
PA	.34	.28***	.03†	.38	.29	.26***	.25***	.27***
Comp	.36	.21*	.15†	.26*	.52	.43	.54	.30
VOL	.28***	.27***	.18*	.21*	.56	.40	.58	.32

Note. Correlations are based on subjects with pair-wise complete data. Sample sizes were between 104 and 131 for all correlations with the exception of Sound Blending which had a sample size between 84 and 96. Unless otherwise noted, correlations are statistically significant at the p < .001 level. *** p < .005, ** p < .01 * p < .05, † Not significant.

Descriptive statistics for the first three PELI forms, administered fall, winter, and spring, are reported in Table 1. Growth was consistent for the Alphabet Knowledge and Phonemic Awareness subtests. Mean scores on the Vocabulary/Oral Language and Comprehension subtests increased from beginning of year to end of year, then experienced a slight decrease from middle of year to end of year.

Inter-rater reliability is reported in Table 1 and alternate-form reliability is reported in Table 2. Inter-rater reliability was strong across all PELI subtests. Alternate form reliability for the PELI Total Score is reported in Table 3. Strong correlations were observed for the PELI Total Score, and both the Alphabet Knowledge and Phonemic Awareness subtests. While still statistically significant, the Vocabulary/Oral Language and Comprehension subtest correlations were notably lower.

Table 4 reports concurrent criterion-related correlations between the PELI subtests and the CELF, PPVT, and TOPEL standardized measures. Significant correlations were noted between PELI subtests and standardized measures assessing similar domains, such as PELI Alphabet Knowledge and TOPEL Print Knowledge (.75) and PELI Vocabulary/Oral Language and CELF Expressive Vocabulary (.72). Strong correlations between PELI Alphabet Knowledge and DIBELS Letter Naming Fluency (.84), PELI Vocabulary/Oral Language and IGDI Vocabulary (.56) were also noted. While not as strong, a significant correlation was seen between PELI Phonemic Awareness and IGDI Sound Blending (.38) (correlations reported in Table 5).

Discussion

Overall, the results these studies support the use of the PELI as a screening assessment that can be used to identify preschool children that may need additional support acquiring early literacy skills. Further research is needed to determine the utility of the PELI as a progress monitoring measure that can be used on a more frequent basis to measure growth. Based on these results, revisions will be made to the forms to increase the alternate form reliability and make the measures more sensitive to growth (particularly Vocabulary/Oral Language and Comprehension).

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On The Farm

at the Beach

What's for Dinner

Preschool Early Literacy Indicators

Dynamic Measurement Group