



Screening for Early Literacy Delays in Preschool Children



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Background

Children develop early literacy skills in the preschool age that are predictive of their later reading abilities.⁽¹⁾ Screening for early literacy delays in the preschool years allows for early intervention, prior to school entry. Such screenings conducted in select preschools and thus are not universally accessible to all preschool-aged children. Prior to school entry, all children do visit their primary care physician. Therefore, the 4-year-old Well Child Care (WCC) visit presents the ideal opportunity for universal literacy screening.

In previous studies, the principal investigator developed two screening measures for this purpose, which will be validated in this study:

- Early Literacy Screener (ELS): This is a 5-item parent questionnaire for 4 and 5-year-old children designed to predict the risk of later reading failure.⁽²⁾
- Early Literacy Skills Assessment Tool (ELSAT): This is a 10-item picture book-based clinician-administered assessment for 4-year-old children that predicts risk of later reading failure.⁽³⁾

Specific Aims

The aim of this study is to validate the ELS and ELSAT against standard reference measures of language and early literacy (Peabody Picture Vocabulary Test [PPVT], Get Ready to Read-Revised [GRTR-R], and Comprehensive Test of Phonological Processing-2 [CTOPP-2]) and home literacy environment (Stim-Q Preschool) in multiple community-based preschool sites.

Methods

- We plan to recruit 150 four-year-old children and their parents before testing the tools in a clinical setting. For this 8-week portion of the project, we recruited 17 children from 3 UCLA-associated preschools: University Village, the Fernald Child Development Center, and the Kreiger Early Child Care Center. In the future, children and their families will be recruited from the LA Unified School District (LAUSD), as well as from partnerships with Head Start preschools.
- Written, informed consent was obtained from participating families. Parents who consented were asked to fill out an initial questionnaire that asks about patient and family characteristics, demographic information, and previous diagnosis of developmental delay or neuro-disability in their child. Parents will be compensated for their time with a \$20 gift card.
- Children were assessed using the ELSAT and the three reference measures (PPVT, GRTR-R, and CTOPP-2)
- The children were tested individually in an isolated area away from distractions in their preschools. The ELSAT and the CTOPP2 were administered to all children by a single examiner. A second trained research assistant administered PPVT and a third trained research assistant administered the GRTR-R. No direct feedback or praise will be provided to the children during the testing, except for reminders to stay on task, as needed. The testing was completed in a single sitting and children were given a sticker when they completed the testing.
- Results of each child's performance in the reference measures will be shared with their parents along with information about resources for those who score below the average range on any one of the reference measures.

Inclusion Criteria:

- Only 4-year-old children from families that speak English as their primary language will be eligible since the test measures are only available in English.

Exclusion Criteria:

- Children with a prior diagnosis, per parent report, of a known developmental disability that precludes their active participation in the assessments will be excluded.

Power analysis:

- Based on our previous studies, with an expected failure rate of 35%, a sample size of 150 will provide a margin of error less than 15% for sensitivity and specificity for ELS such that the 95% confidence interval (CI) will be (0.80, 0.94) and (0.35, 0.63) respectively.
- For the ELSAT, with an expected failure rate of 40%, a sample size of 150 will provide a margin of error less than 11% for sensitivity and specificity of ELSAT such that the 95% CI will be (0.84, 0.96) and (0.60, 0.82) respectively.

Statistical Analyses:

- For this portion of the study, correlations of ELSAT with PPVT, GRTR-R and CTOPP-2 were computed. We will also examine the correlation of the ELS vis-à-vis the reference measures. When the data collection is complete, we will generate Receiver Operating Characteristic (ROC) curves and corresponding sensitivities and specificities and area under the curve (AUC) will be calculated for different cut-off scores, for the ELS and ELSAT separately.

Results

- The results presented below represent our initial pilot data from 17 children. The mean age of the study sample was 55.8 months (S.D. 5.9). There were 9 girls (53%) in the sample.
- The mean scores in the ELSAT and all reference measures are shown in Table 1. The correlations between the ELSAT and reference measures are shown in Table 2.

Table 1. Mean scores in the ELSAT and all reference measures (n=17)

Measure	Mean (S.D)
ELSAT (Max score 10)	7.5 (2.9)
PPVT (Standard score)	128.4 (13.2)
GRTR-R (Standard Score)	104.1 (11.3)
CTOPP-2 (Composite Score)	114 (9.1)

Table 2. Correlations between ELSAT and reference measures

Pearson's Correlation ELSAT	PPVT	GRTR-R	CTOPP-2
	0.6	0.8	0.4

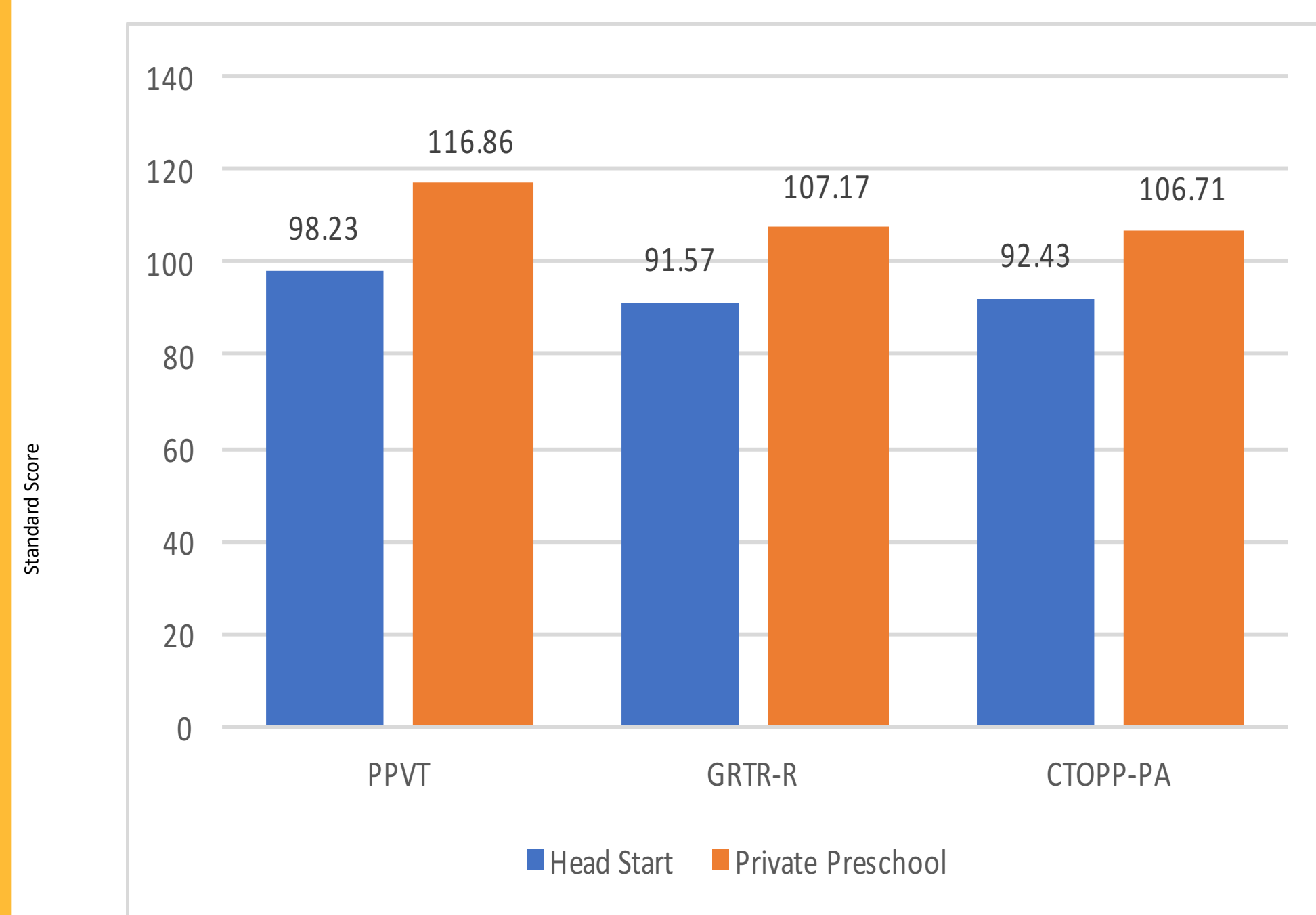
Preliminary Data

Children have varying levels of early literacy skills at kindergarten entry.⁽⁴⁾ About 40% of children enter kindergarten one or more years behind their peers, and this gap widens over time.^(4,5) By third grade, about 33% are reading below grade level.⁽⁶⁾ The cost of trying to remediate these delays far exceeds the cost of early identification and intervention.⁽⁷⁾

In a previous study,⁽³⁾ the principal investigator found that children from private preschools (n=35) significantly outperformed children in Head Start preschools (n=61), highlighting the language and literacy gap that exists in children from lower socio-economic backgrounds, prior to entering school. (Figure 1)

A number of factors influence the child's reading readiness at school entry, such as the home literacy environment,⁽⁸⁾ quality of parent engagement,⁽⁹⁾ maternal education,⁽¹⁰⁾ poverty and other elements of toxic stress,⁽¹¹⁾ the child's physical and emotional health and development, and exposure to quality preschool education.⁽¹²⁾

Figure 1.⁽³⁾ Literacy gap between children from private preschools versus children from Head Start preschools



PPVT: Peabody Picture Vocabulary test
GRTR-R: Get Ready to Read-Revised
CTOPP-PA: Comprehensive Test of Phonological Processing-Phonemic Awareness

Figures

Figure 2. Peabody Picture Vocabulary Test (PPVT)



Figure 3. Peabody Picture Vocabulary Test (PPVT) Sample

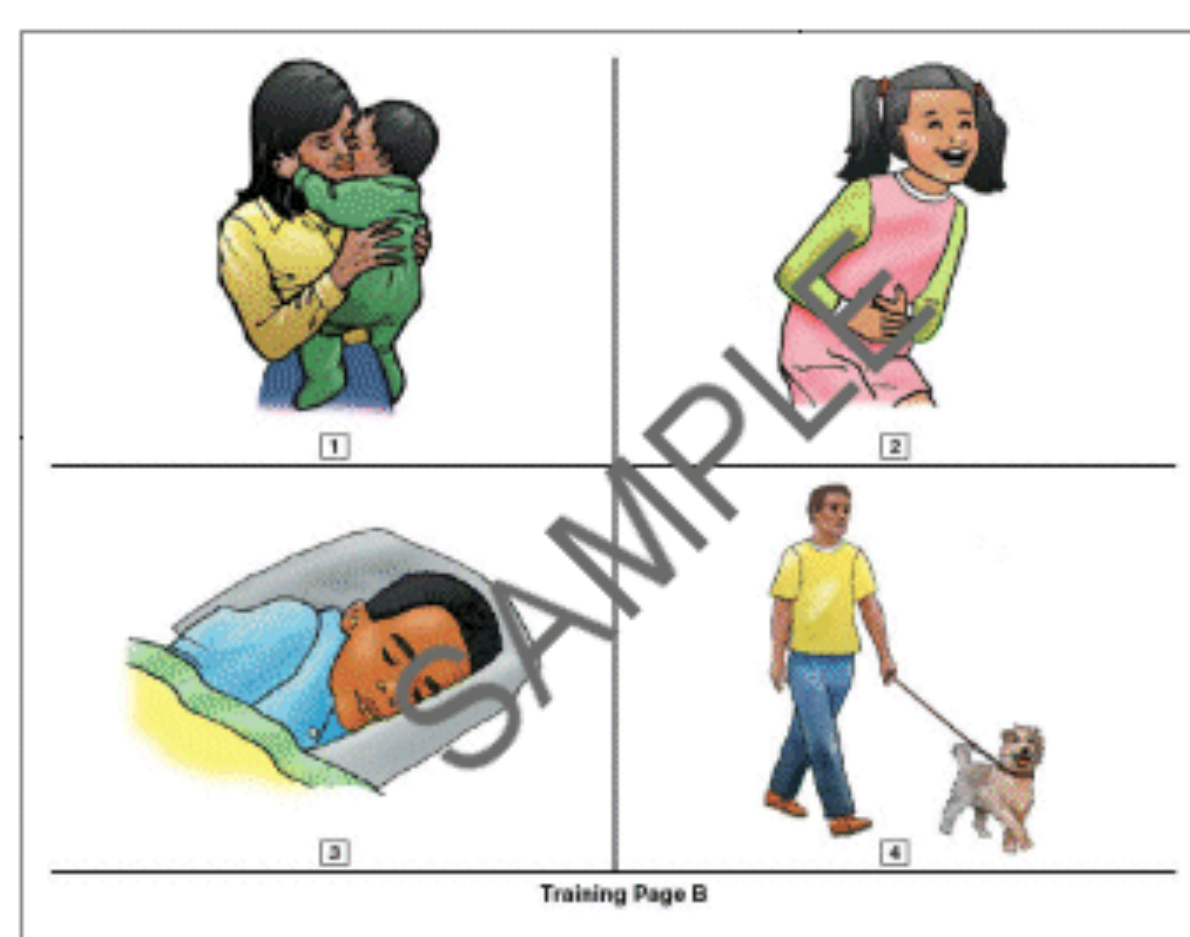


Figure 4. Comprehensive Test of Phonological Processing 2 (CTOPP2)

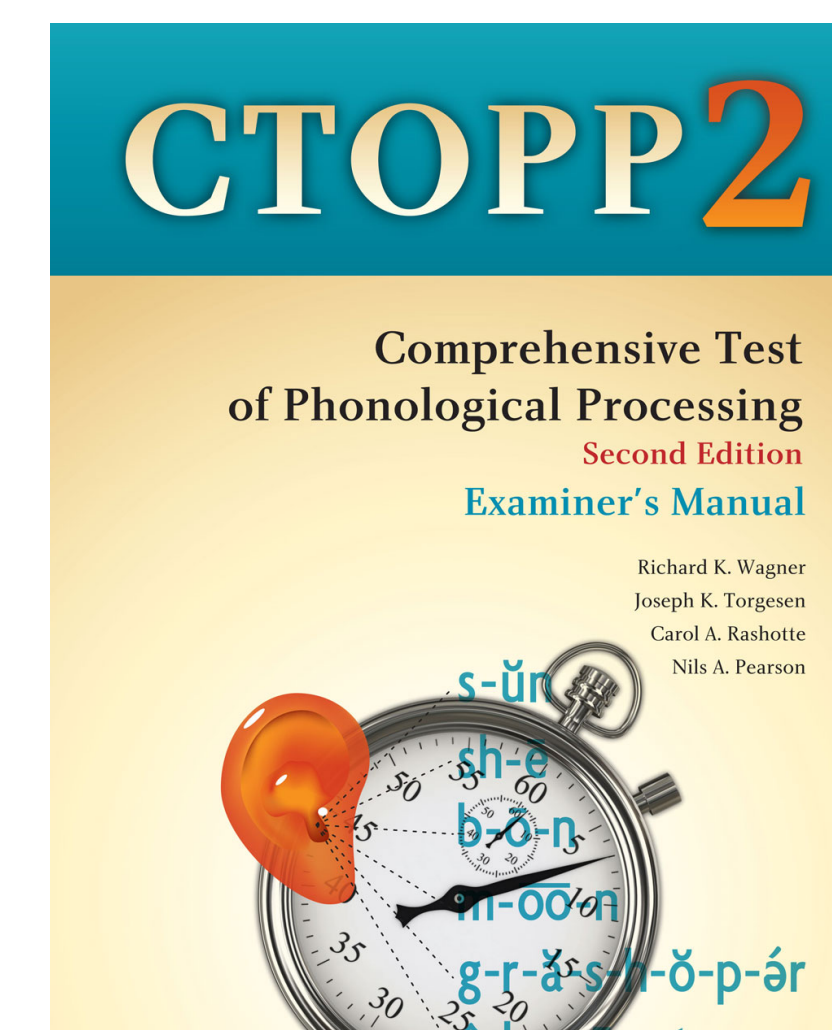


Figure 5. Comprehensive Test of Phonological Processing 2 (CTOPP2) Scoring Sheet



Figure 6. Book used in association with the ELSAT

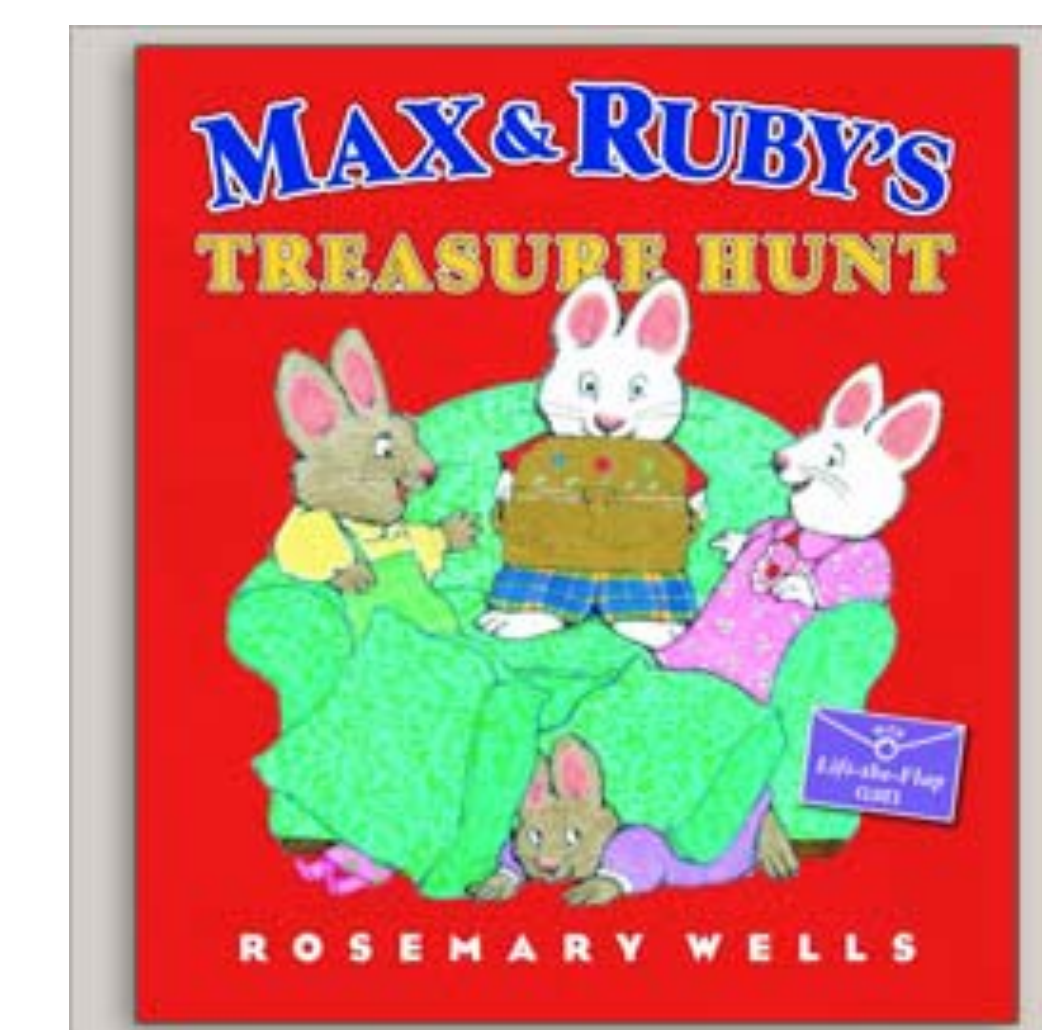


Figure 7. 10-item Early Literacy Skills Assessment Tool (ELSAT)

1.	Show me the name of the book.	
2.	Which line do I read last?	
3.	What is this letter?	R
4.		Y
5.		S
6.		m
7.	Letter sound association	What sound does this letter make (point to H)?
8.		What sound does this letter make (point to S)?
9.	Rhyming	What word rhymes with 'stout'?
10.	Word segmentation	Say the word 'downstairs' without saying 'down'

Discussion and Conclusion

Our preliminary results from this sample are similar to our previous findings, with the ELSAT showing strong correlation with the GRTR-R and the PPVT and modest correlation with the CTOPP-2. Given that our current sample is from a higher socio-economic group, future studies incorporating children from middle and lower income groups will be important for observing how they perform on the ELSAT in comparison to our present representative group.

As a result, the 10-item ELSAT shows promise as a brief, practical screening tool for early literacy delays in preschool children. After successful completion of this project, our next steps will be to study the feasibility and validity of these tools in clinical practice and conduct a randomized controlled trial of literacy screening versus usual care in primary care pediatric settings. We also plan to perform a longitudinal follow-up of children assessed with the ELS and ELSAT and determine the predictive validity of these measures.

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