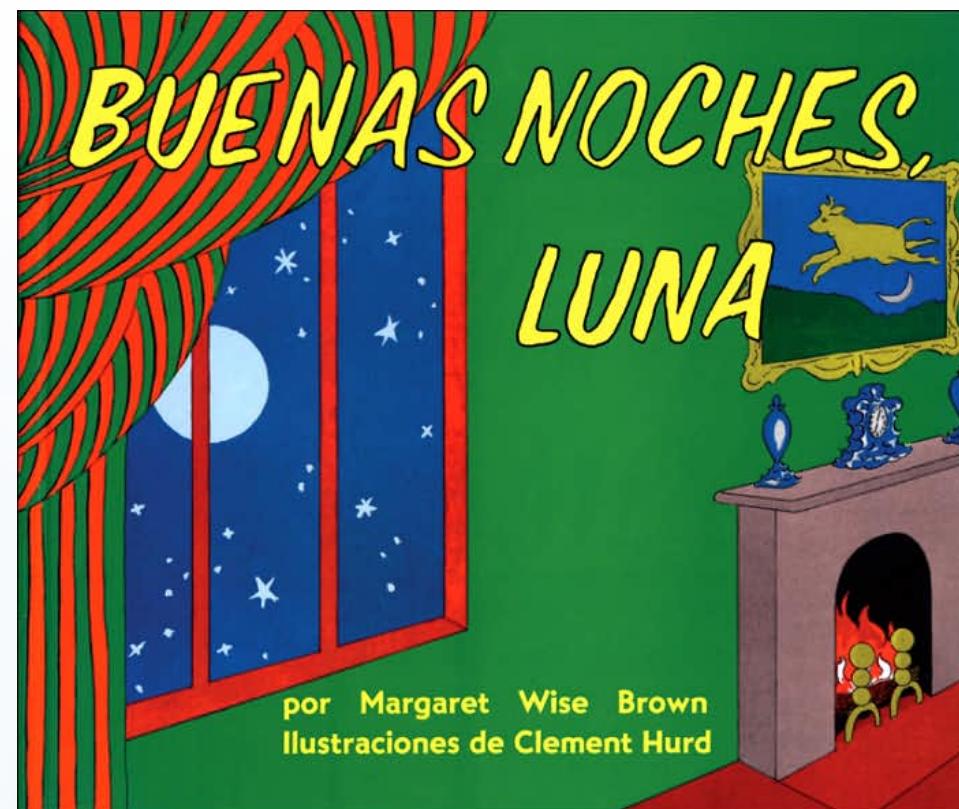


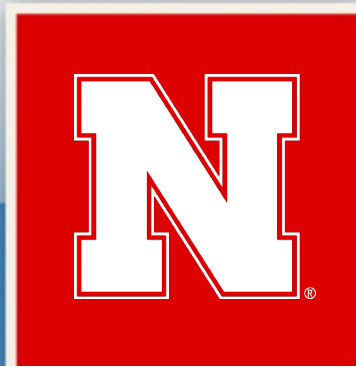
# The Simple View of Mathematics? Shared Predictors of Reading Comprehension and Mathematics for Language-Minority Children

J. Marc Goodrich & Jessica M. Namkung



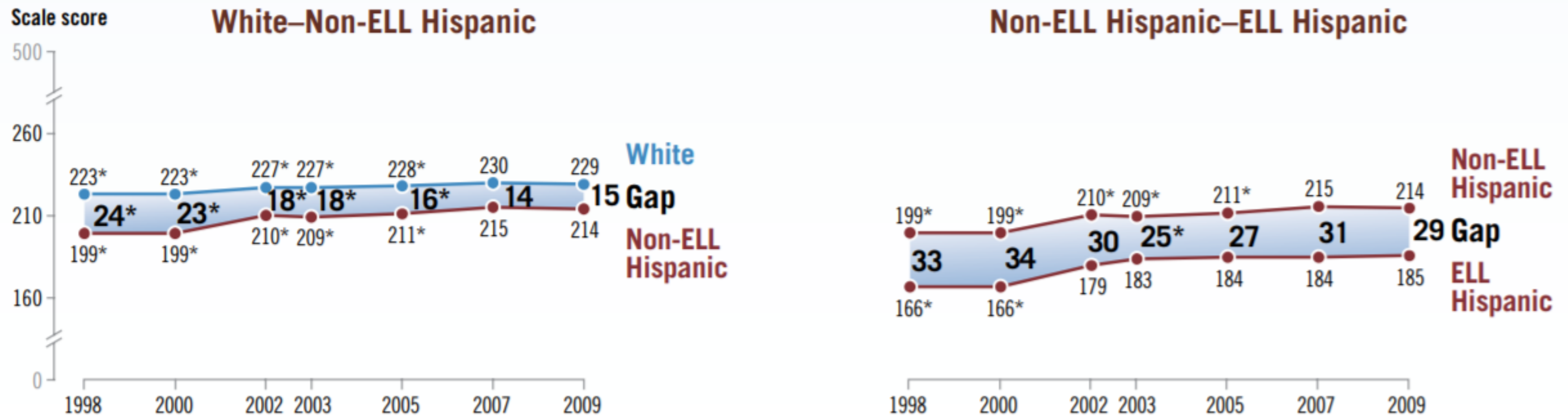
## Language-Minority Children

- Any child who speaks a language other than English at home
- Focus on Spanish-speakers for this study
- Lower reading and math achievement than monolingual students  
(Hemphill et al., 2011)
- Lower English language skills than monolingual students (Hoff, 2013)



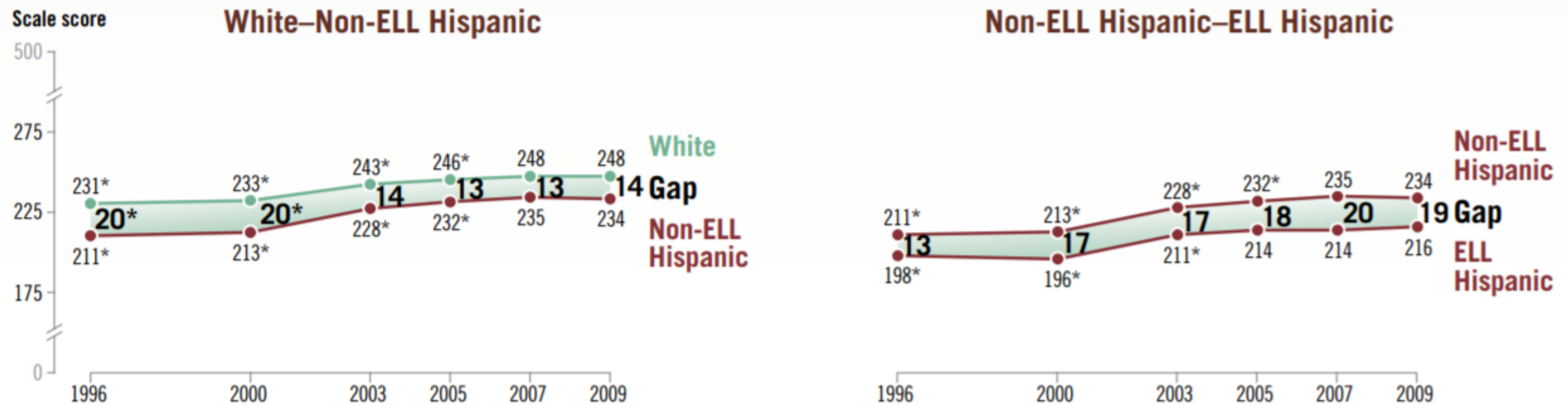
# Language-Minority Children

**Figure 23. Reading achievement score gaps between Hispanic and White public school students at grade 4, by English language learner status: Various years, 1998–2009**



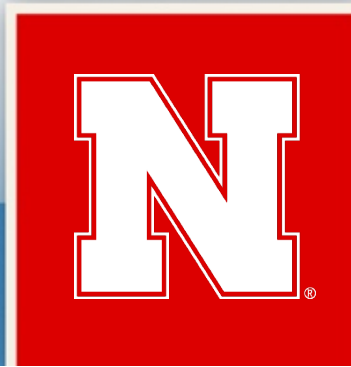
# Language-Minority Children

**Figure 11. Mathematics achievement score gaps between Hispanic and White public school students at grade 4, by English language learner status: Various years, 1996–2009**



## Simple View of Reading

- Reading comprehension can be expressed as a mathematical equation
- $\text{Decoding} \times \text{Language Comprehension} = \text{Reading Comprehension}$



# Mathematics Assessment

- Calculations
- Word problems

Addition Tables : 8 & 9

9	9	9	9	9
<u>+0</u>	<u>+1</u>	<u>+2</u>	<u>+3</u>	<u>+4</u>

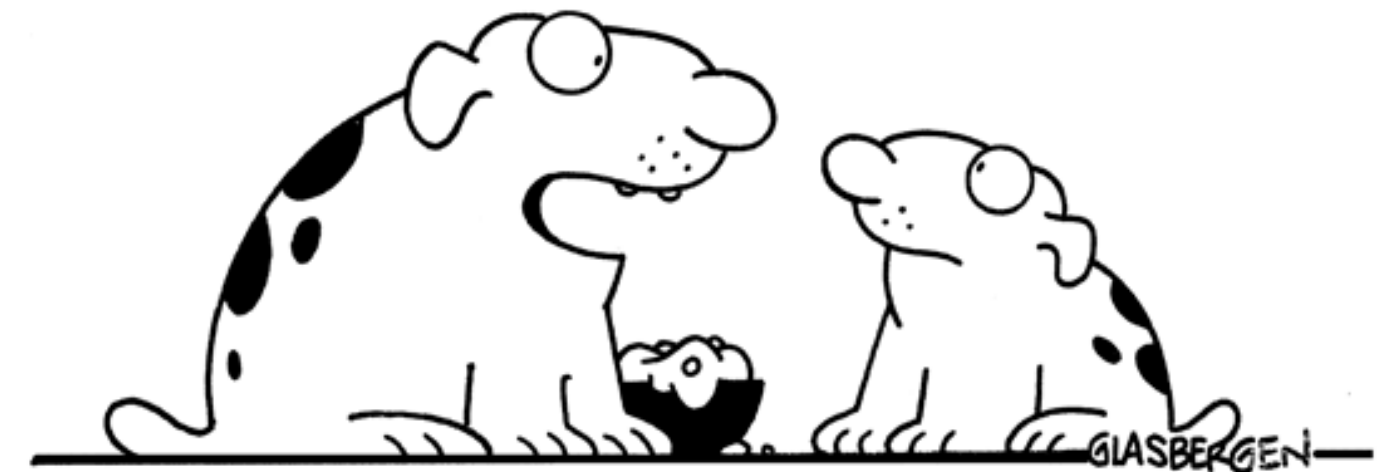
9	9	9	9	9
<u>+5</u>	<u>+6</u>	<u>+7</u>	<u>+8</u>	<u>+9</u>

8	8	8	8	8
<u>+0</u>	<u>+1</u>	<u>+2</u>	<u>+3</u>	<u>+4</u>

8	8	8	8
<u>+5</u>	<u>+6</u>	<u>+7</u>	<u>+8</u>

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**DOG MATH**



**“If I have 3 bones and Mr. Jones takes away 2,  
how many fingers will he have left?”**



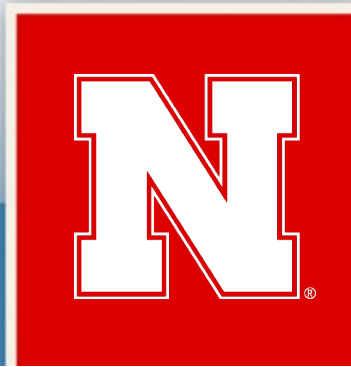
## Research Questions

- Is the simple view of reading relevant for Spanish and English reading comprehension of language-minority children?
- Do Spanish skills contribute to English reading comprehension (and vice versa)?
- Do measures of word-problem solving serve as a proxy for reading comprehension?



## Methods

- 72 Spanish-speaking children in 1<sup>st</sup> and 2<sup>nd</sup> grade
- 55.6% female, ranged in age from 75 to 108 months
- Completed four subtests of Woodcock-Johnson Achievement Tests and Woodcock-Muñoz Pruebas de Aprovechamiento
- Letter-Word Identification, Picture Vocabulary, Passage Comprehension, Applied Problems



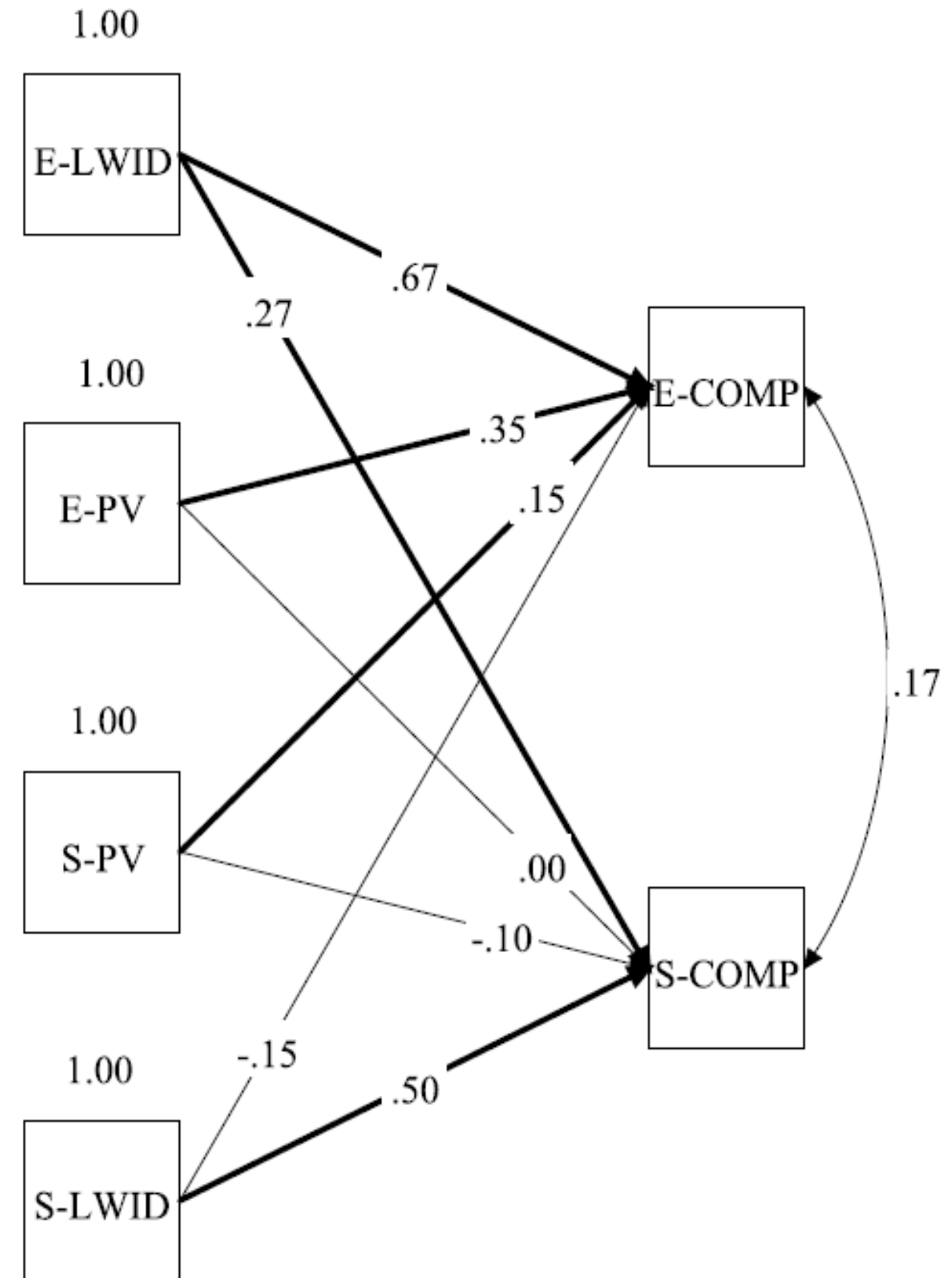
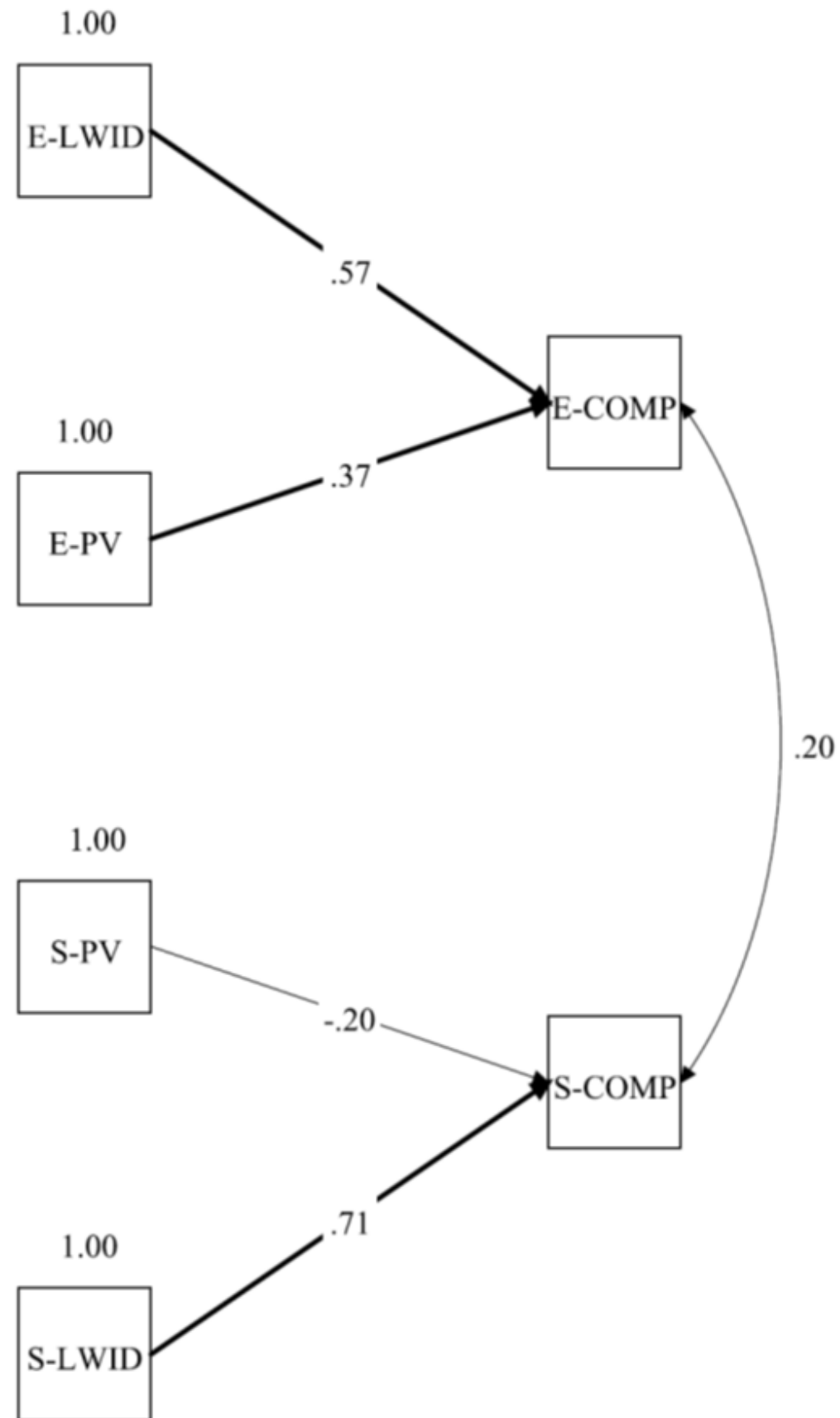


# Results – Descriptives

	Mean	(SD)	Min	Max
<b>English</b>				
LWID	104.39	10.73	80	134
PV	83.50	8.03	65	101
PC	92.48	10.19	59	110
AP	95.96	10.91	69	116
<b>Spanish</b>				
LWID	79.31	20.12	37	133
PV	65.04	20.57	24	107
PC	71.28	20.77	20	108
AP	89.21	14.29	45	117



# Results – RQ1



# Results – RQ2

Figure 3a

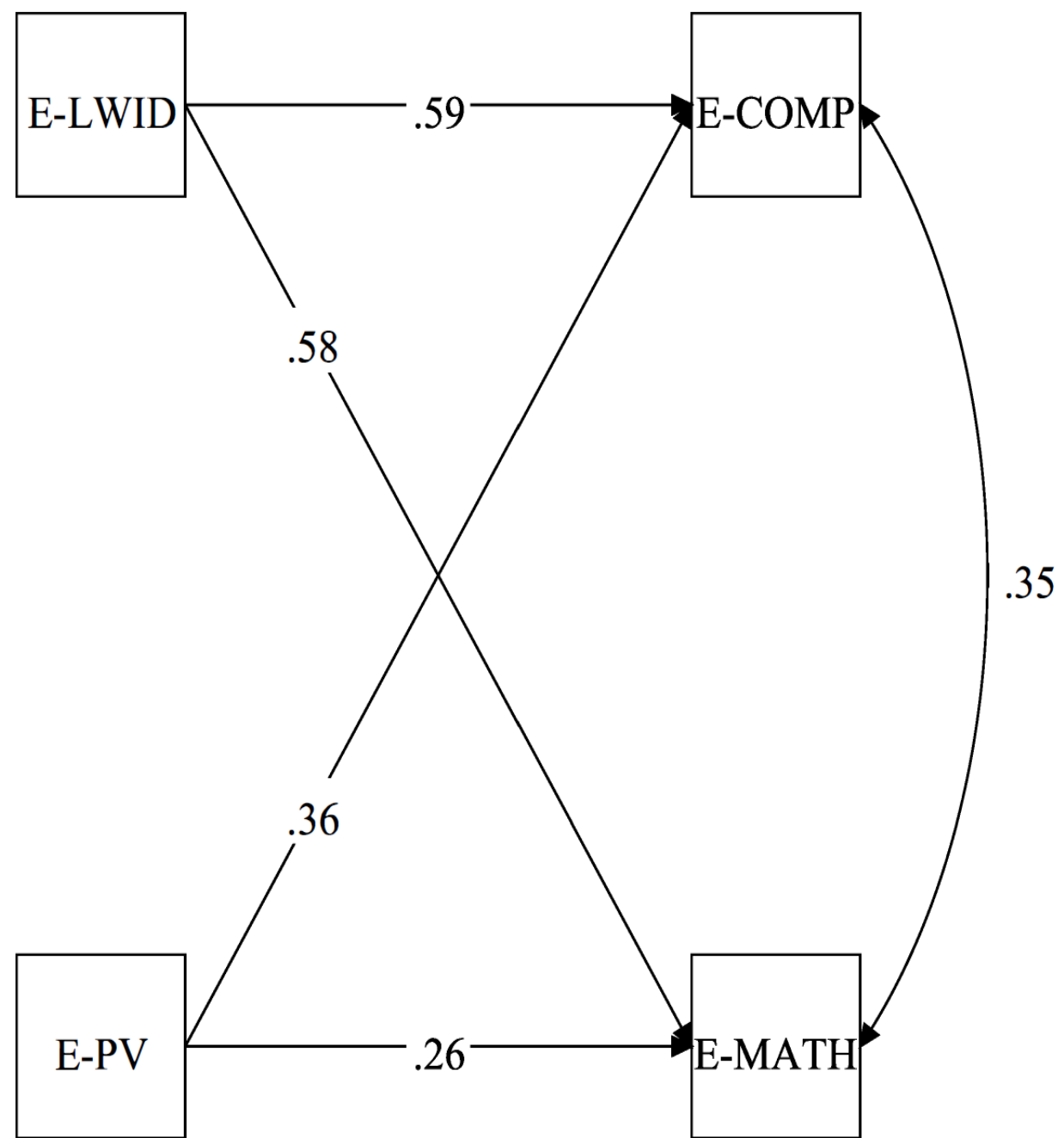
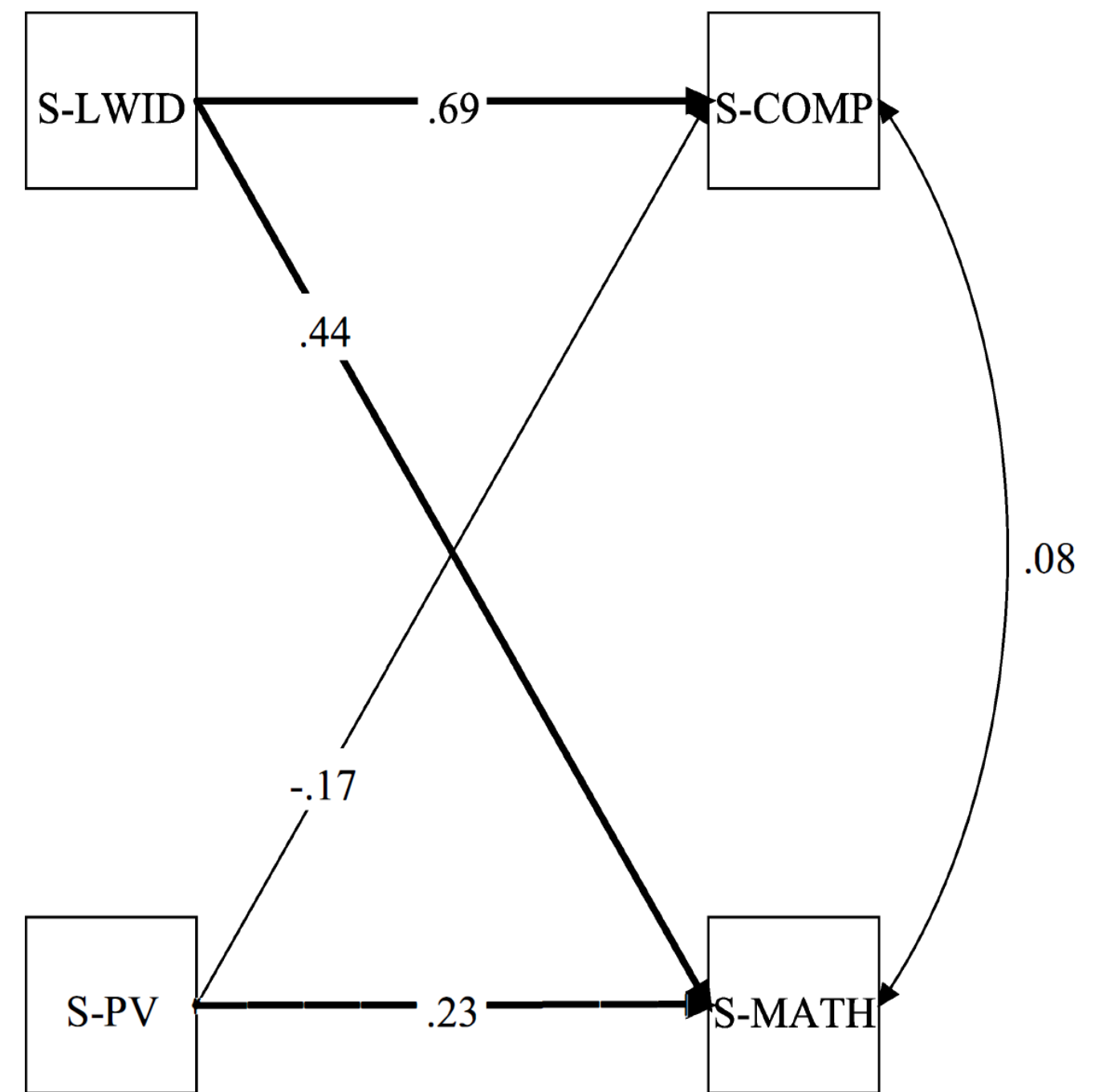
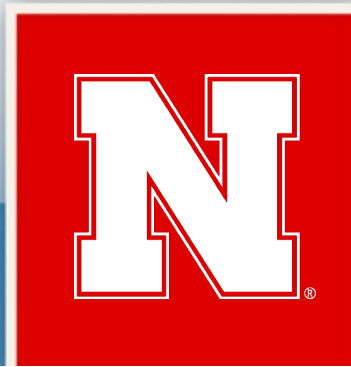


Figure 3b



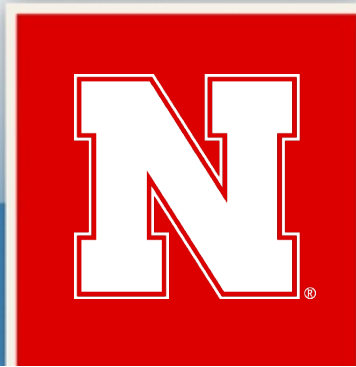
## Discussion & Implications

- English may be language-minority children's stronger language
- Supporting skills in L1 can make a positive contribution to reading comprehension in L2



## Discussion & Implications

- Assessments of word-problem solving skills may not be the best mathematics assessments for young language-minority students
- Support for language skills should be integrated into early mathematics instruction to ensure language-minority students do not fall behind



Thank you!

