

# Fourth Grade Reading Outcomes in Kindergarten Children with Language Impairments

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## Introduction

Numerous studies have documented that children with developmental language impairments often develop reading disabilities in the early school years (Aram & Nation, 1980; Bishop & Adams, 1990; Catts, 1993). The present investigation was undertaken to further explore the reading outcomes of children with language impairments (LI). We identified a large group of children with LI in kindergarten and examined their language, phonological processing, nonverbal IQ, and reading achievement in kindergarten, 2<sup>nd</sup> and 4<sup>th</sup> grades. This poster reports on the 4<sup>th</sup> grade reading outcomes and factors related to these outcomes.

## Method

Participants were a sub-sample of a representative group of children who took part in an epidemiologic study of children with LI (Tomblin et al., 1996). In kindergarten, 208 children with LI and 268 with typical language development were identified. Children with LI performed at least 1.25 SD below their age-expected mean on at least 2 of 5 composite measures, including vocabulary, grammar, narration, expressive language, or receptive language. Children with LI were further sub-grouped into those with specific language impairments (SLI; nonverbal IQ >87) and those with nonspecific language impairments (NLI; nonverbal IQ ≤87). Children with normal language (N) had nonverbal IQs greater than 87. All children spoke English as their primary language, and had no history of sensory deficits, mental retardation, autism, or neurological disorders. Table 1 displays the tests or experimental tasks employed over the course of this investigation.

Table 1. Test battery administered in this investigation.

	K <sup>a</sup>	2 <sup>nd</sup>	4 <sup>th</sup>
<b>Language</b>			
TOLD2-P	X		
Narrative story task	X		
CELF-III		X	X
PPVT-R		X	X
CREVT		X	X
Narrative production task		X	X
<b>Phonological Processing</b>			
Deletion task	X	X	X
Rapid naming of animals task	X	X	X
<b>Nonverbal Abilities</b>			
WPPSI (Block Design, Picture Completion)	X		
Wechsler Intelligence Scale for Children-III		X	
<b>Letter Identification</b>			
Woodcock Reading Mastery Tests-Revised	X		
<b>Reading Comprehension</b>			
Woodcock Reading Mastery Tests-Revised		X	X
Gray Oral Reading Test-III		X	X
Diagnostic Achievement Battery-2		X	X

## Findings

### Question 1:

How do kindergarten children with NLI, SLI, and normal language compare on 4<sup>th</sup> grade reading achievement (reading comprehension composite scores)?

- Children with NLI had significantly lower scores than did kindergarten children with SLI, who in turn, had significantly lower scores than did the normal control group (see Table 2).
- Approximately 84% of children with SLI and 97% of children with NLI scored below the mean of our locally-normed sample (see Figure 1).
- 35.9% of kindergarten children with SLI and 63.7% of children with NLI could be classified as reading disabled in 4<sup>th</sup> grade, using a commonly accepted criterion for RD (<-1 SD; see Figure 2).

### Question 2:

Do poor readers with a history of SLI and NLI differ in type of reading disability?

- Poor readers were classified into subgroups based on the Simple View of Reading (Catts & Kamhi, 1999; Gough & Tunmer, 1986; See Figure 3).
- Children with SLI more often showed a dyslexic profile than children with NLI, who most often displayed an LLD profile. This difference was due, in part, to the fact that children with NLI more often maintained their language deficits into the 4<sup>th</sup> grade.

### Question 3:

What factors best distinguish children with LI who have good reading outcomes from those with poor reading outcomes?

- Table 3 shows that in kindergarten the factor that best distinguished children with good vs. poor outcomes was nonverbal IQ. This finding is consistent with differences observed in the reading outcomes of SLI vs. NLI groups.

Beyond kindergarten, language ability best differentiated those with good vs. poor outcomes. A related finding, not shown here, indicated that the amount of language gain from kindergarten to 4<sup>th</sup> grade was closely related to reading achievement. Children who made the greatest gains in language composite score over the four-year span had the highest reading achievement.

Table 2. Reading comprehension composite score

	SLI	NLI
Normal	SLI	NLI
N=268	N=117	N=91
Mean (SD)	Mean (SD)	Mean (SD)
101.9 (12.4)	87.2 (12.6)	78.8 (14.7)

Figure 1  
Reading comprehension score distribution

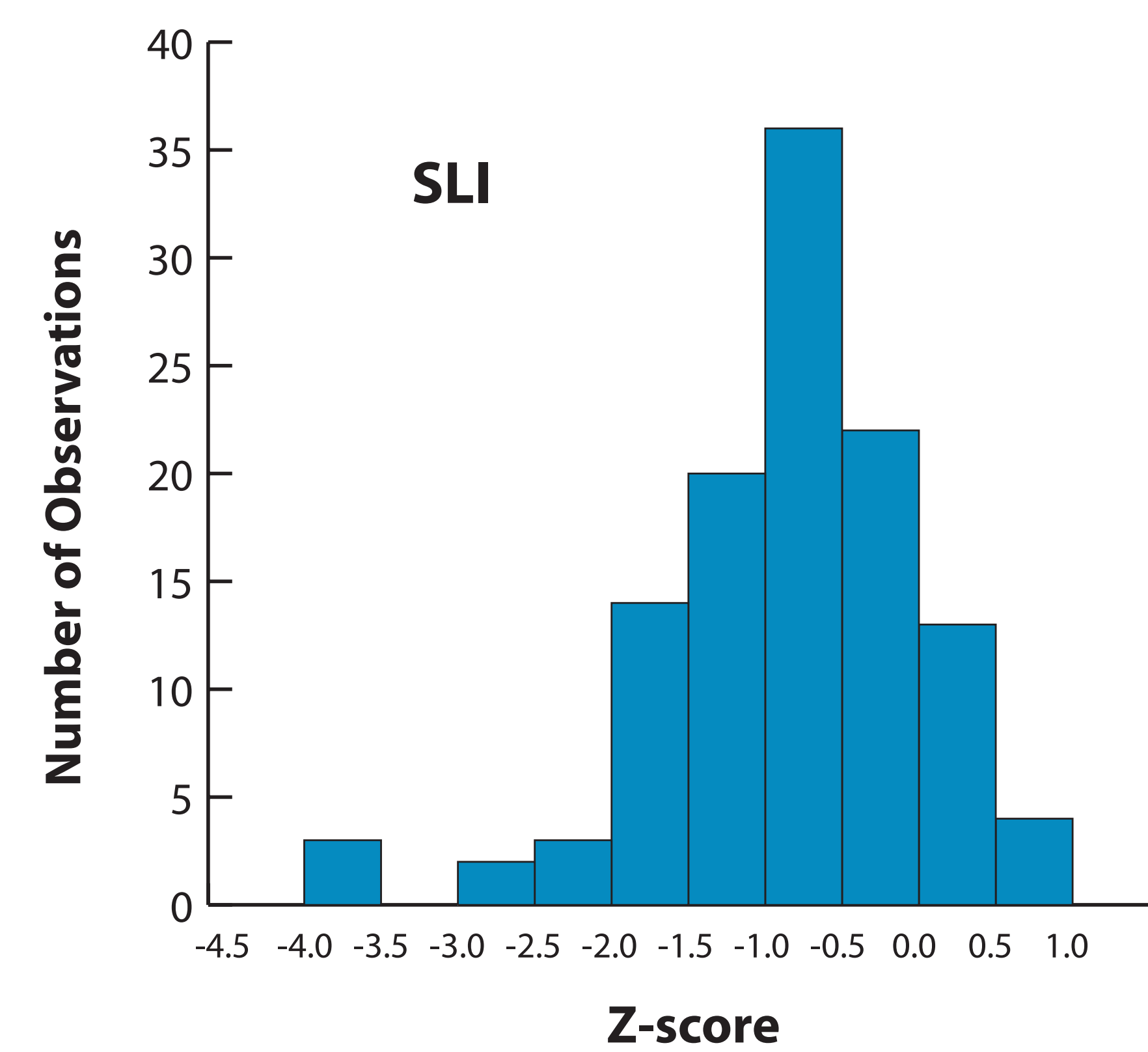


Figure 2  
Percentage of children in each group meeting the criterion for reading disability in 4th grade

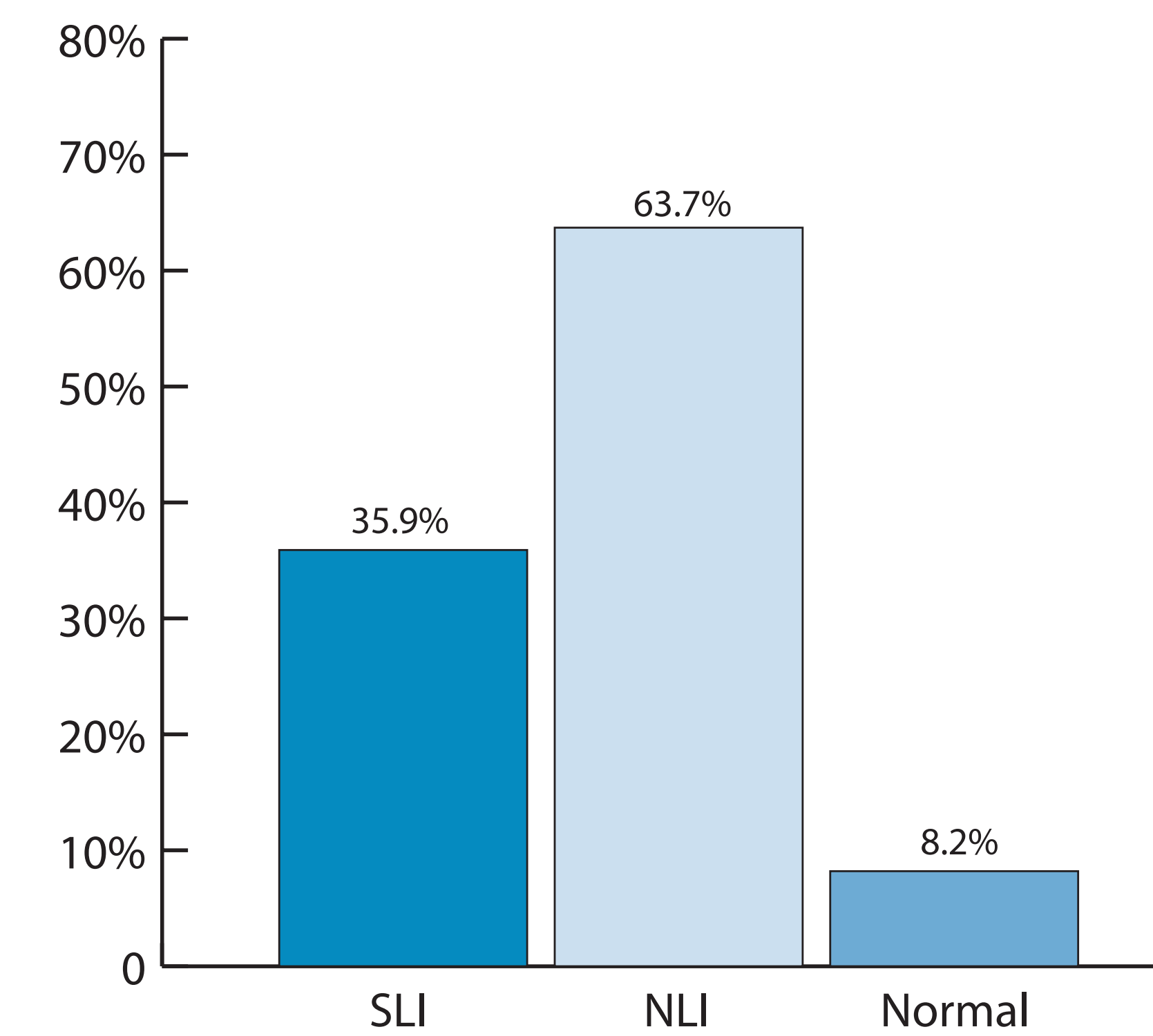
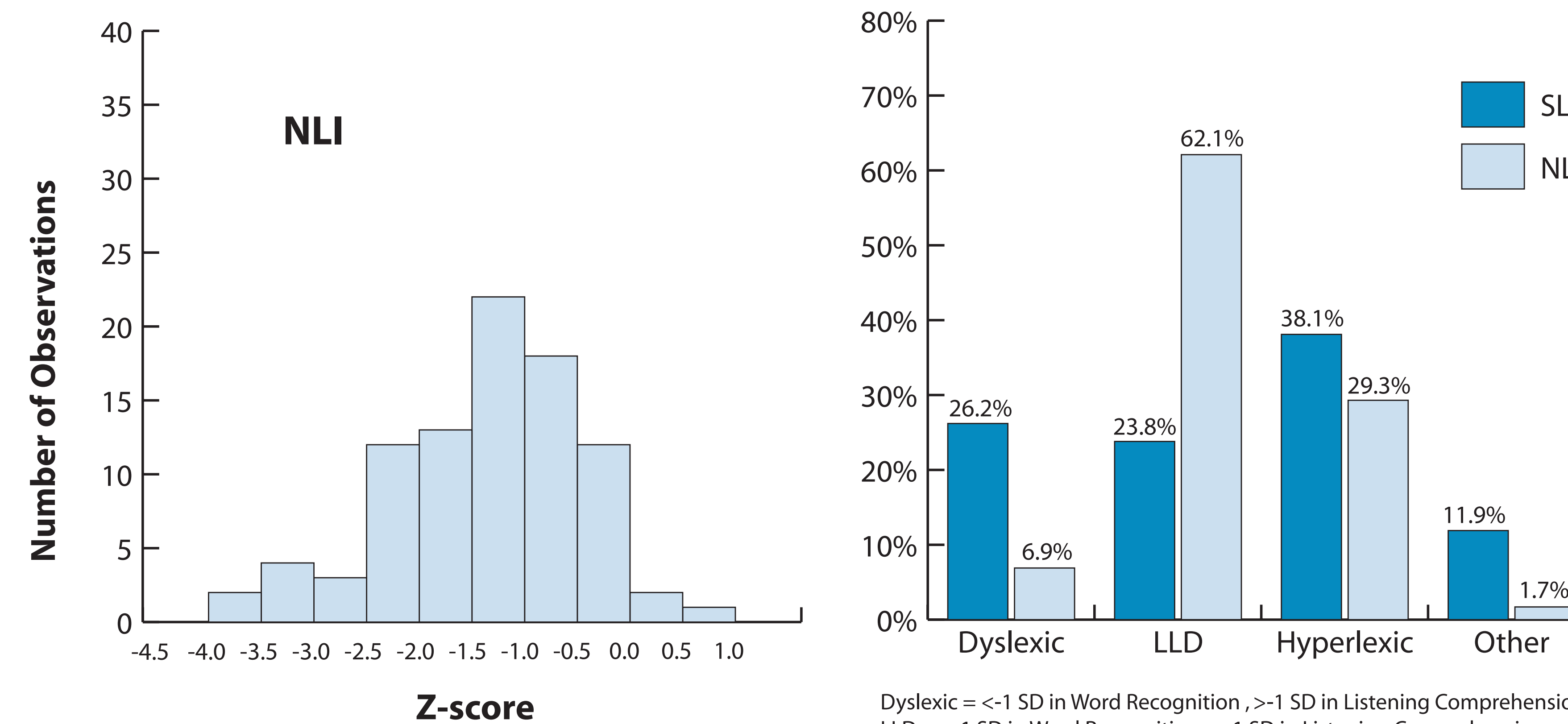


Figure 3  
Percentage of SLI and NLI poor readers in subgroups based on simple view of reading



Dyslexic = <-1 SD in Word Recognition, >-1 SD in Listening Comprehension  
LLD = <-1 SD in Word Recognition, <-1 SD in Listening Comprehension  
Hyperlexic = >-1 SD in Word Recognition, <-1 SD in Listening Comprehension  
Other = >-1 SD in Word Recognition, >-1 SD in Listening Comprehension.

Word Recognition – Woodcock Reading Mastery Tests  
Listening Comprehension – PPVT, CELF-III

Table 3. Scores of good and poor readers on measures administered in kindergarten, 2<sup>nd</sup>, and 4<sup>th</sup> grades.

	Good Readers N=31		Poor Readers N=100*	
	Mean (SD)	Mean (SD)	Effect size	
<b>Kindergarten</b>				
Nonverbal IQ	97.2 (13.7)	83.4 (14.9)	.88**	
Language	79.0 (5.6)	73.2 (7.1)	.81**	
Phono Awareness	88.9 (10.3)	83.3 (6.9)	.69**	
Rapid Naming	93.7 (12.4)	84.7 (15.1)	.60*	
Letter Id	100.3 (13.1)	89.9 (13.8)	.73**	
<b>Second Grade</b>				
Language	91.6 (88.8)	75.6 (11.1)	1.27**	
Nonverbal IQ	93.4 (11.4)	82.8 (13.8)	.76**	
Phono Awareness	95.1 (12.0)	79.0 (20.7)	.79**	
Rapid Naming	94.4 (13.4)	84.8 (19.7)	.51	
<b>Fourth Grade</b>				
Language	95.5 (6.9)	73.7 (13.1)	1.45**	
Phono Awareness	99.5 (9.1)	79.4 (25.6)	.82**	
Rapid Naming	94.2 (16.1)	83.6 (19.1)	.56*	

\* Good readers scored above the 40<sup>th</sup> percentile, poor readers scored below the 16<sup>th</sup> percentile (i.e., <-1 SD).

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