Receptive Language in SLI

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Background & Purpose

- Specific language impairment is characterized as poor language ability in the absence of hearing impairment, cognitive impairment, and frank neurological damage (Leonard, 1997)
- While receptive language deficits are a feature of specific language impairment, emphasis has traditionally focused on expressive language deficits most likely due to:
  - Historical bias towards expressive language deficits (Aram & Nation, 1975; Rapin & Allen, 1987)
  - Lack of sensitive receptive language measures (Leonard, 2009)
  - Distinctions between expressive and receptive language disorders (World Health Organization, 2005)
- This study examines receptive language skills in preschool-aged children with and without specific language impairment across three different receptive language measures in order to:
  - Identify each measures' ability to discriminate between children with and without SLI
  - Examine how frequently receptive deficits are documented on the different measures
  - Determine whether receptive deficits tend to be test-specific or are detected with multiple receptive language domains
- By comparing performance on different types of receptive language tests, we aim to illustrate the effect of different tests in the identification of receptive deficits in children with SLI. Our **hypotheses** are:
  - Measures will differ in their ability to discriminate between children with and without SLI and identify receptive deficits
  - Receptive deficits are not limited to the most severe children with SLI, but may instead characterize a majority of these children

Method

Participants

- 39 children (17 girls, 22 boys) with the diagnosis of SLI and 39 age- and sex-matched peers with typical language development (TD group)
  - Native English speakers
  - Passed hearing screening
  - Received a minimum standard score of 75 or higher on the nonverbal scales of the *Kaufman Assessment Battery for Children—Second Edition*, (KABC-II, Kaufman & Kaufman, 2004)
- Children were classified as SLI or TD based on scores from the *Structured Photographic Expressive Language Test-Preschool, 2nd Edition* (SPELT-P2; Dawson, Stout, Eyer, Tattersall, Fonkalsrud, & Croley, 2005)

	SLI(N=39)		TD (N=39)	
	Mean	SD	Mean	SD
Age in months	59.6	6.1	58.9	5.3
Mothers' years of education	14.1	1.6	14.4	2.0
SPELT-2	71.3	13.8	106.0	9.7
KABC-II	98.2	18.2	106.9	14.1

Method (continued)

Task & Materials

- Children were administered three receptive language measures in random order during a preschool summer program
  - Peabody Picture Vocabulary Test-4th Edition (PPVT-4; Dunn & Dunn, 2007)
    - Measures single word lexical knowledge
    - Response format: picture pointing
  - The Grammatical Understanding subtest of the Test of Language Development-Primary, 3rd Edition (TOLD-GU; Newcomer & Hammill, 1997)
    - Measures comprehension of grammaticality of sentences
    - Response format: picture pointing
  - Shirts & Shoes Test (Plante & Vance, 2011)
    - Measures morphosyntactic comprehension of clause types, spatial and temporal terms, and subordinating and coordinating conjunctions.
    - Response format: movement of tokens

Analysis

- The performance of the two groups of children (SLI and TD) on the three receptive tests were examined with separate linear discriminant function analysis for each language test

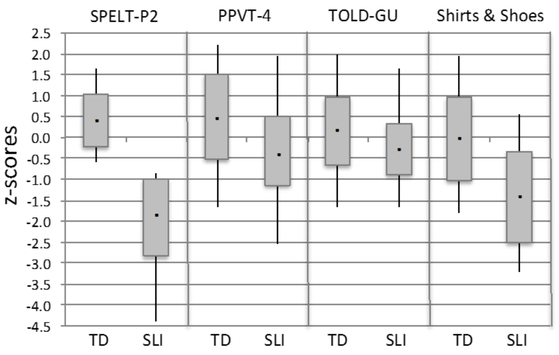
Results

- Significant group differences were found for each receptive language test: for PPVT-4, $F(1, 76) = 14.78$, $p<.001$, $\eta 2=.16$; for TOLD-GU, $F(1, 76) = 6.83$, $p<.05$, $\eta 2=.08$; and for Shirts & Shoes, $F(1, 76) = 34.1$, $p<.0001$, $\eta 2=.31$.

Group Averages and Standard Deviations on Receptive Language Tests

	SLI group		TD group	
Test	Mean	SD	Mean	SD
PPVT-4	95.21	12.25	107.26	15.27
TOLD-GU	9.15	1.86	10.44	2.44
Shirts & Shoes	78.54	16.30	99.18	14.88

Relative distribution of language test scores for Typically-Developing (TD) and Specific Language Impairment (SLI) groups. Test scores were scaled as z-scores (mean =0, SD=1) to permit direct comparison. Boxes indicate +/- 1SD from the participant group mean. Vertical lines indicate the minimum and maximum scores.



Results (continued)

Diagnostic Accuracy Compared to Original SPELT-P2 Classification

Test	Sensitivity	Apparent error rate	Specificity	Apparent error rate	Cut-off score[1]
PPVT-4	69.2%	30.8%	59.0%	41%	101
TOLD-GU	66.7%	33.3%	69.2%	30.8%	10
Shirts & Shoes	69.2%	30.8%	74.0%	26.0%	90

1. Standard scores below the cut score identify impairment.

SLI Classification Overlap Between Measures

- 61 children (78% of all participants) received SLI classification on at least one of the receptive language measures
- 37 children (95% of SLI group) received SLI classification on at least one of the receptive language measures

Children classified by	All Participants		SLI	
	Number	Percent	Number	Percent
1 Test	18	30%	9	23%
2 Tests	21	34%	13	33%
3 Tests	22	22%	15	39%

- Correlations between the performance of all participants on different receptive language tests were moderate (PPVT-4 and TOLD-GU: $r=.62$, $p<.01$; PPVT-4 and Shirts & Shoes: $r=.60$, $p<.01$; TOLD-GU and Shirts & Shoes: $r=.047$, $p<.01$).

Discussion

- Overall, the children with SLI have weaker receptive language skills than the TD children
- No measure achieved the established criterion recommended for clinically-useful specificity and sensitivity for identifying SLI (80% minimum; see Plante & Vance, 1994).
  - Cut-scores that best differentiated the groups were different for the three tests
- The measures did not always identify the same set of children as having receptive deficits
  - Performance differences across measures likely reflect distinct aspects of receptive language tested and response modality differences
- Different performance outcomes may provide local versus global deficit characterizations

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Acknowledgements

Research reported in this poster was supported by NIH-NIDCD under Award Number F31DC014375. Travel was supported by Herbert E. Carter Travel Award and the SRCLD STAR Award. The authors have no disclosures related to the work.