



False Memory in Children with Specific Language Impairment and Children Who Stutter: A Pilot Study

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Abstract

Previous studies have implicated deficits in vocabulary knowledge in children with specific language impairment (SLI) and children who stutter (CWS). To further explore the similarities and differences of the lexical-semantic systems of these clinical populations, we examined list recall performance in three groups of children: SLI, CWS, and children who were typically developing (TD). The stimuli consist of 12 lists of 8 words selected from Roediger and McDermott (1995). Each list is constructed around a semantic theme that is not itself presented. Preliminary results indicated that the children with SLI showed fewer correct recalls and more errors than the TD children; the performance of the CWS fell in the middle. All children demonstrated a serial position effect such that words at the list-final position were recalled with the highest accuracy and those in the middle were recalled with the lowest accuracy. Comparison of recall errors indicated that the children with SLI had proportionally fewer semantic and phonological intrusions and more unrelated intrusions than the other two groups. These patterns suggested weaknesses in activating both semantic and phonological properties of the lexicon in the children with SLI. The similar error profiles between the CWS and the TD group suggested relatively intact lexical-semantic organization in the CWS group.

Background

Children with SLI have known vocabulary deficits.

➤ Symptoms include: late onset of first words, smaller vocabulary size as compared to age norms, word retrieval difficulties in both spontaneous discourse and confrontation naming tasks, and difficulties generating semantically related word associations (Bishop, 1997; Watkins, Kelly, Harbers, & Hollis, 1995; McGregor, 1997; Sheng & McGregor, 2010, in press).

➤ These deficits have been attributed to under-specified phonological and semantic representations (Lahey & Edwards, 1999; McGregor, Newman, Reilly, & Capone, 2003) and weakly linked semantic networks (Sheng & McGregor, 2010).

CWS were also reported to have weaker vocabulary knowledge than TD peers.

➤ Patterns include: lower scores on tests of vocabulary, smaller lexical diversity (Anderson & Conture, 2000; Hall, 2004; Wagovich & Ratner, 2007), and less specified phonological representations of words (word representations that are holistic rather than segmental) (Anderson, 2009; Byrd, Conture, & Ohde, 2007).

These findings indicate immaturities in the lexical-semantic systems in both groups of children. In the current study we use a false memory paradigm to investigate the organization of the lexical-semantic system among children with SLI, a population who have known linguistic processing deficits, CWS, a population who have subtle linguistic inefficiencies, and children who are TD.

➤ We hypothesize that the SLI and the CWS groups will demonstrate fewer accurate recall and more intrusions (false recalls)

➤ We will explore similarities and differences in the error profiles of the three groups

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Participants

n=4	Age (mos)	Gender	Maternal Education	NVIQ ^a	SPELT ^b	TNL ^c	PPVT ^d	EVT ^e	NWRT ^f	MD ^g
SLI	82.50	3M; 1F	16	99.50	70.33	79.00	91.00	88.50	7.00	6.50
CWS	80.25	4M	16.5	105.00	N/A	98.50	118.25	111.00	8.50	12.50
TD	80.25	3M; 1F	16.25	118.00	109.00	113.50	128.75	124.00	11.33	11.00

Note. a. Matrices section of the Kaufman Brief Intelligence Test – 2nd Edition; b. the Structured Photographic Expressive Language Test-3; c. Test of Narrative Language; d. Peabody Picture Vocabulary Test – 4th Edition; e. Expressive Vocabulary Test – 2nd Edition; f. Non-word Repetition subtest of the Comprehensive Test of Phonological Processing (CTOPP); g. Memory for Digits subtest of the CTOPP.

Stimuli & Coding

Table 1. Sample Stimuli

Critical Unpresented Word	Presented Words
Cold	hot, wet, ice, sick, warm, snow, freeze, weather
Sweet	sour, candy, sugar, tooth, good, taste, pie, cake
High	low, up, tall, sky, kite, over, jump, tower
Mountain	hill, climb, top, valley, bike, ski, goat, steep

The stimuli included 12 lists of 8 words selected from Roediger and McDermott (1995). Each list is constructed around a semantic theme that is not itself presented. All the words in each list have at least one rhyme.

Table 2. Definition of Error Types and Examples

Error Types	Example Responses
Critical Lure - Subjects said critical unpresented word.	COLD: weather, snow, freeze, cold , sick ('Cold' is the critical unpresented word.)
Semantic Intrusion - Response was semantically related to any word from list.	HIGH: tower, jump, sky, up, down ('Down' is categorically related to 'up'.)
Phonological Intrusion - Response had same onset (vowel, consonant, or consonant cluster) and same number of syllables, or rhymed with a word from the presented list.	MOUNTAIN: goat, steep, valley, deep ('Deep' rhymes with 'steep'.)
Semantic/Phon.Intrusion - Response fits criteria for phonological and semantic intrusion.	BREAD: toast, meat , bake, slice ('Meat' rhymes with 'eat' and semantically related to 'food'.)
Unrelated - Response did not fit any of the above criteria, as judged by researchers.	SOFT: touch, sin, 'moke', loud
Previous List - Response was a word from a list presented previously within the same session.	SWEET: pie, cake, taste, tooth, fast ('Fast' was presented in the list prior to 'SWEET' and is not phonologically or semantically related to any words in this list.)
Repetition - A correct response was repeated within the recall period for a particular list.	SLEEP: peace, nap, bed, dream, bed (Although the first response of 'bed' was coded as correct, the next production was coded as a repetition.)
Word form - Response was a different form of a presented word.	COLD: weather, snow, freeze, hot, froze , ice ('Froze' is the past tense form of 'freeze'.)

Results

Figure 1. Mean number of correct recalls and recall errors

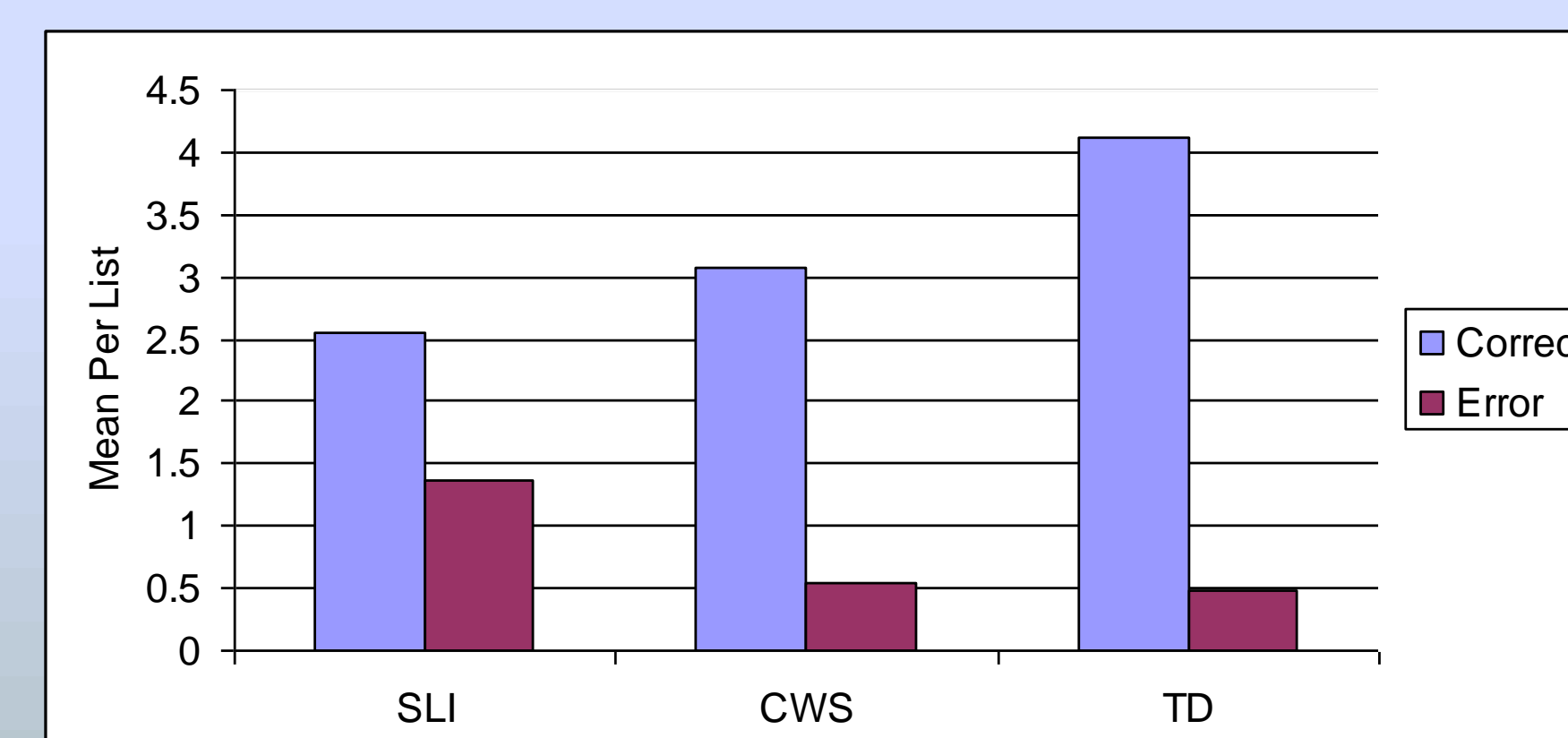


Figure 2. Recall accuracy by serial position

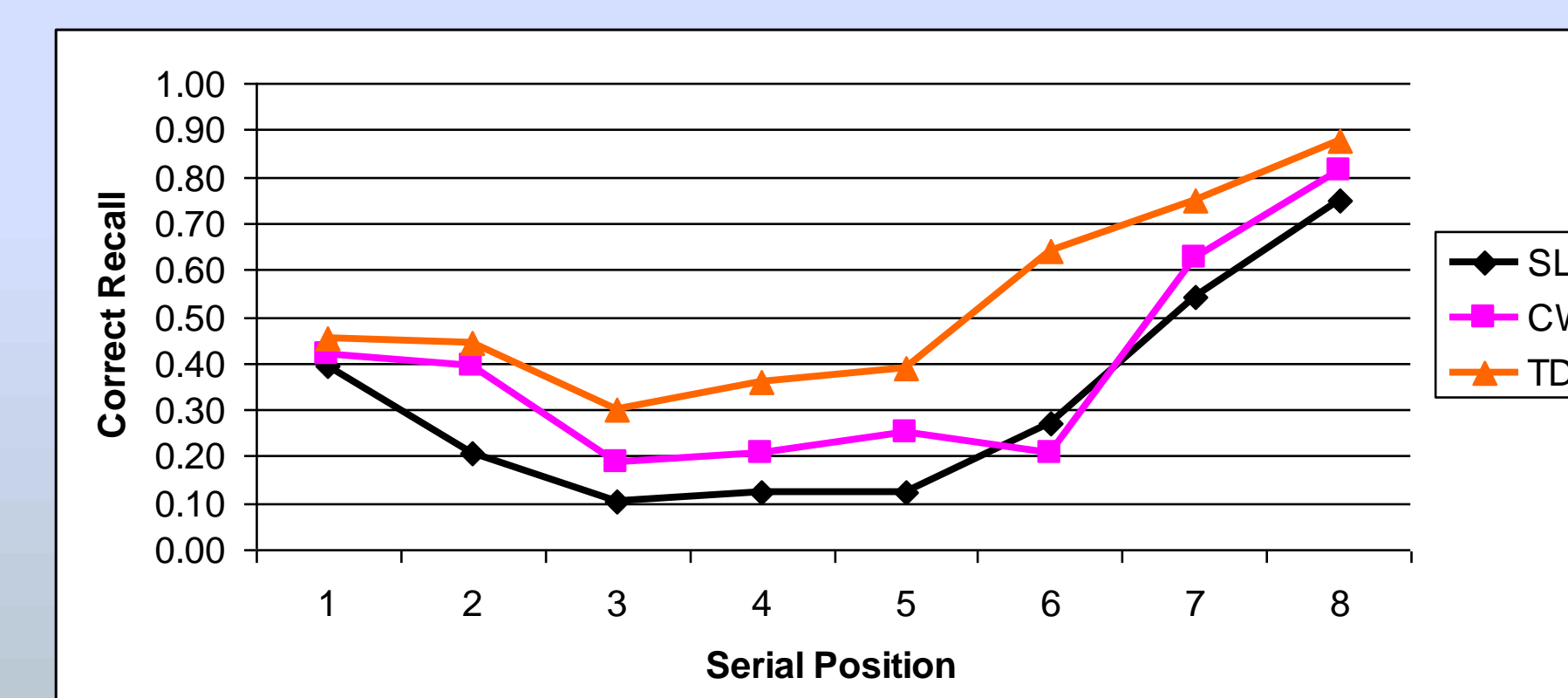
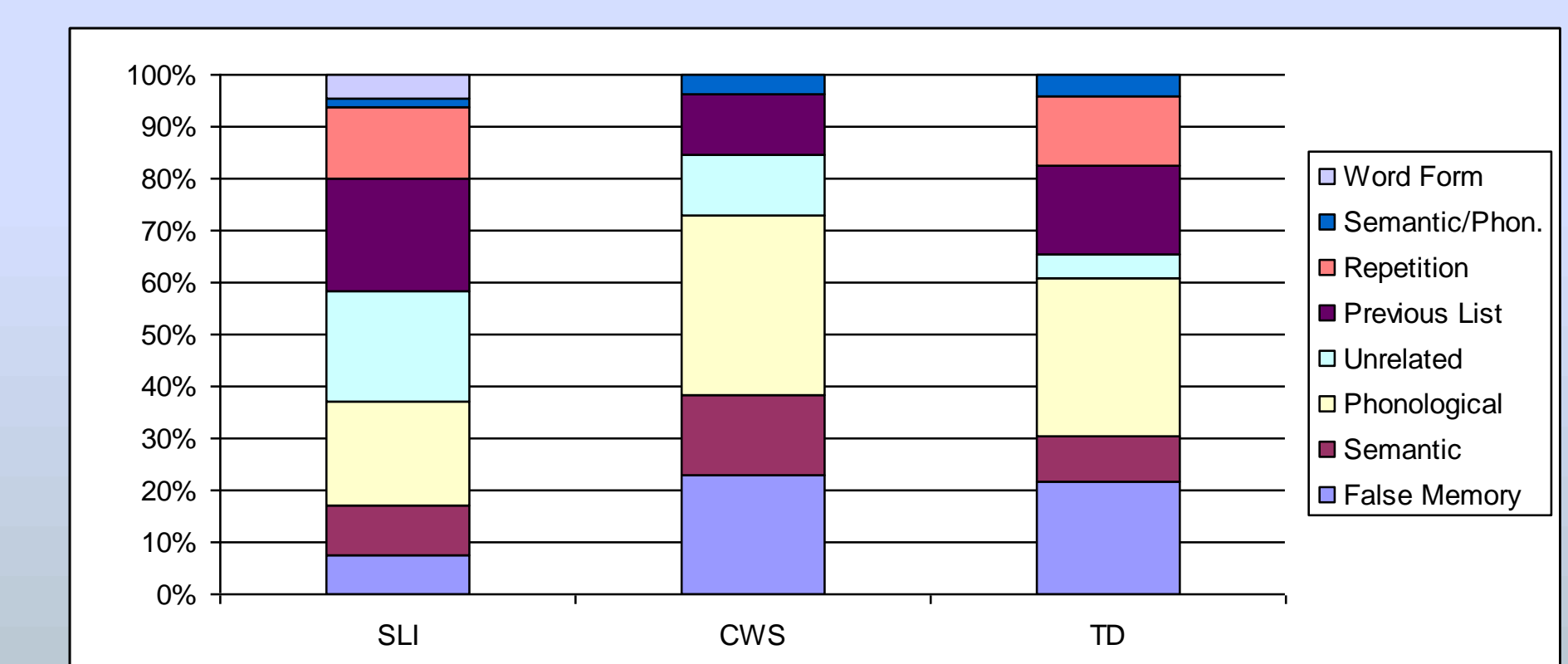


Figure 3. Distribution of recall errors



Children with SLI had fewer correct recalls and more recall errors than the TD group; performance of the CWS fell in the middle.

There was a serial position effect for all children: words at the list-final position were recalled with the highest accuracy; words at the list-middle position the lowest accuracy.

Compared to the CWS and the TD groups, children with SLI made proportionally fewer semantic and phonological intrusions and more unrelated intrusions in this recall task.

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Conclusion & Future Steps

Consistent with previous studies

➤ Children with SLI were less accurate in list recall. Their distinct error profiles suggest less activation of semantically and phonologically similar words and immaturities in lexical-semantic connections (Lahey & Edwards, 1999; McGregor et al., 2002; Sheng & McGregor, 2010).

➤ The CWS demonstrated more subtle difficulties with accurate recall, especially for words in the list-middle positions. Error profiles were largely similar between the CWS and the TD group, indicating relatively intact lexical-semantic organization.

Futures Steps

- Increase sample size to 20 per group
- Explore the relationships between standardized test performance and list recall performance