

COMPREHENSION OF POSSESSIVE AND CONTAINER PHRASES IN CHILDREN WITH SLI

Poster Session Presented at the 2000 ASHA Convention – November 2000

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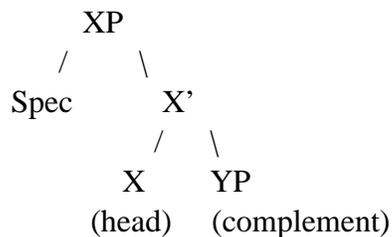
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INTRODUCTION

Children with SLI show a variety of language difficulties, but it is generally agreed that their syntax/grammar is more affected than other language components. More specifically, research on their language production shows marked delays in their acquisition of grammatical morphemes, especially those associated with the verbal system, while the nominal system is mostly intact (Rice and Oetting, 1993; Rice, Wexler and Cleaver, 1996).

Most research studies of children with SLI concentrate on spontaneous language production and do not assess their comprehension of these forms. Therefore, we cannot be certain that their underlying linguistic system is affected. In addition, because English grammatical morphemes concentrate on the verbal system (e.g. agreement and tense morphemes marked on the verb) and the nominal system is morphologically poorer, studies of English language production will likely find more difficulties with the verbal system.

Current linguistic theory (X-bar theory) states that all phrases follow the same structure. So that a phrase XP (whether it's part of the verbal system, e.g., IP or the nominal system, e.g., DP) will have the structure:



So, at least structurally, there is no reason why the IP should present more problems than the DP. A discrepancy might be possible due to “features” contained within each phrasal category: IP contains agreement and tense features, DP contains agreement only. According to Rice and Wexler (1996), children with SLI do not recognize Tense as an obligatory feature, so the deficit is in the IP only. Clahsen (1989) argues that their difficulty lies in a lack of specification of agreement features that are present in both the DP and IP.

An intact adult grammar contains lexical (LC) and functional categories (FC), which are fully developed for feature specification and structural hierarchy. Features are contained within specific structural positions, so full feature specification should be the last to develop in children (hierarchical structures and functional categories must be in place). Therefore, depending on their developmental stage, children with SLI may show delays because:

1. they have not acquired full hierarchical structures and therefore cannot have full feature specification or;
2. they have acquired full hierarchical structures but still do not have full feature specification.

Case theory states that all NP's must be Case marked. In the IP, nominative Case is assigned to spec of IP by agreement features contained in the head I, while in the DP, genitive Case is assigned to the possessor by agreement features contained in the head D. Both types of assignment rely on spec-head agreement. Researchers have long noted that children with SLI seem to have no difficulty with determiner-noun plural agreement (e.g., Rice and Oetting, 1993), which is a case of head-head agreement. If the feature "agreement" is not a problem in the DP, then perhaps the difficulty children with SLI show with the possessive 's is related to a lack of specifier position in their DP's, which prevents them from obtaining spec-head agreement to assign genitive Case to the possessor.

The present investigation focused on the status of the nominal functional category, DP, in children with SLI and their normally developing peers. It used comprehension tasks to arrive at a possible structure available to children with SLI and their peers based on their interpretation of carefully selected Noun Phrases. It also used spontaneous language production data to determine whether similar conclusions could be achieved using production and comprehension data.

METHOD

10 subjects participated in each of 3 groups:

SLI

- ages 4;9 to 5;5 (mean = 5;0).
- passed a hearing screening at 25 dB (500, 1K, 2K, 4KHz).
- passed the Articulation subtest of TOLD2-P.
- obtained a non-Verbal IQ score of at least 90 on the Columbia Mental Maturity Scale (CMMS).
- received a z-score of -1.14 or lower on the Syntax Quotient composite of TOLD2-P.
- had no history of neurological, behavioral, or emotional difficulties.

LM(Language Matches)

- ages 3;7 to 4;5 (mean = 3;11).
- passed a hearing screening at 25 dB (500, 1K, 2K, 4KHz).
- passed the Articulation subtest of TOLD2-P.
- obtained a non-Verbal IQ score of at least 90 on the CMMS.
- scored within one standard deviation from the mean on the Syntax Quotient composite of TOLD2-P (if age > 4 years).
- passed school-wide speech-language screening.
- each subject matched to one SLI subject by MLU (+/- .2).

AM(Age Matches)

- ages 4;7 to 5;7 (mean = 5;2).
- each subject matched to one SLI subject by age (+/- 2 mos).

A spontaneous language sample containing at least 140 utterances was obtained from each SLI and LM subject to determine their Mean Length of Utterance in morphemes (MLU), and for analysis of language production.

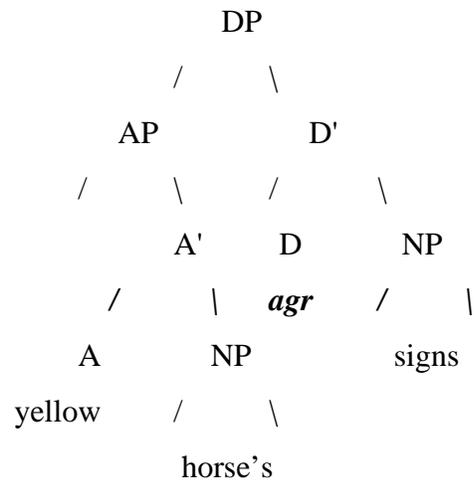
TASK 1 - ADJECTIVE + POSSESSION PHRASE

In phrases such as, "the yellow horse's signs"

yellow modifies horse and not signs, giving the following bracketing paradigm

[[yellow horse]'s signs]

and the structural representation:



where *agr* assigns genitive Case to the whole AP "yellow horse".

This task used a modified version of a procedure used by de Villiers' et al. (1996) to test phrases such as "the two bears' signs". Children were presented with the following toys and instructions:

First set-up: One red horse and one yellow horse. Each had the following in front of his house:

4 signs (2 red, 2 yellow)

4 feathers (2 red, 2 yellow)

4 chairs (2 red, 2 yellow)

Subjects were presented with Miss Piggy in a toy car and they were told, "Miss Piggy is not a very good driver. She keeps running into things when she drives, I'm gonna tell you what she runs into and you make her do it".

Pre-test for instructions and plural understanding:

Miss Piggy knocked over the red chairs

Miss Piggy knocked over the signs

Test items:

- i) Miss Piggy knocked over the red horse's chairs
- ii) Miss Piggy knocked over the yellow horse's sign
- iii) Miss Piggy knocked over the red horse's feathers

Second set-up: One big duck and one small duck. Each had the following in front of his house:

4 trees (2 big, 2 small)

4 horns (2 big, 2 small)

4 mailboxes (2 big, 2 small)

Test items:

- i) Miss Piggy knocked over the big duck's trees
- ii) Miss Piggy knocked over the little duck's horns
- iii) Miss Piggy knocked over the big duck's mailboxes

In the example stimulus “the yellow horse's signs”, subjects could respond by:

- 3. assigning the adjective “yellow” to the possessor (a correct response) by knocking over all of the yellow horse's signs;
- 4. assigning the adjective to the objects by knocking over all the yellow signs belonging to both horses;
- 5. assigning the adjective to both the possessor and the object by knocking over only the yellow signs belonging to the yellow horse; and
- 6. other unrelated responses.

RESULTS

PROPORTION OF RESPONSES ACCORDING TO ASSIGNMENT OF ADJECTIVE

Assigned adjective to:

GROUP	POSSESSOR	OBJECT	BOTH	OTHER
SLI	.41	.26	.18	.13
LM	.53	.11	.18	.16
AM	.93	.02	.03	.01

Paired t-tests showed significant differences in the number of correct responses provided by LM as compared to AM subjects ($t=-3.27$, $p=.0048$) and by SLI as compared to AM subjects ($t=-4.97$, $p=.001$). No significant differences were found between SLI and LM. Both SLI and LM subjects seemed to treat these phrases as if they were ambiguous, such as is the case in the phrase “big dress sale”, where we don't know if the event is a sale of big dresses or a big sale of dresses. This interpretation is only possible if they can't reliably recognize that 's is a Case marker and that “yellow horse” occupies spec of DP. Task 2 provides further insight into this question.

TASK 2 - COMPOUND V. POSSESSION OR CONTAINER PHRASES

This task was designed to determine whether subjects were willing to interpret 2-noun series as compound nouns, so that Case theory would not be violated in interpreting possession and container phrases.

The first part of this task assumes that possessors must be case marked with 's by agreement features in D, therefore two-noun strings (without 's) must be interpreted as compounds by adults. A child who does not recognize 's as a Case marker will randomly interpret two-noun strings as either compound or possessor constructions whether or not the 's is present:

Part 1: Compound versus possessive

Subjects were presented with 2 contrasting pictures and were asked to "point to the picture that goes with what I say."

- | | | |
|----|--------------|----------------|
| 1) | flower dress | flower's dress |
| 2) | cat mug | cat's mug |
| 3) | bear pillow | bear's pillow |
| 4) | bunny cookie | bunny's cookie |
| 5) | girl bottle | girl's bottle |
| 6) | monkey mask | monkey's mask |
| 7) | dog mitten | dog's mitten |
| 8) | duck brush | duck's brush |

The second part of this task was designed to determine whether subjects are sensitive to the dummy "of" preposition, whose only function in a phrase is to assign Case. It is commonly inserted in "container expressions" and its absence forces a compound interpretation in adults.

Part 2: Compound versus container

Subjects were presented with 2 contrasting pictures and were asked to "point to the

contrasts, LM subjects produced the possessive 's in spontaneous speech much more frequently (96%) than SLI subjects (48%). To investigate whether individual children in each group had difficulty with this form both productively and receptively, Pearson correlations were performed on the proportion of correct responses for "possession versus compound" comparisons and proportion of use of possessive s in obligatory contexts in spontaneous speech.

SLI subjects' production rate of possessive 's correlated highly with correct responses for "possession versus compound" ($r=.70$, $p=.023$), indicating that SLI children with higher ratios of production of possessive 's in spontaneous speech also had higher ratios for its comprehension. For LM subjects, this correlation did not quite reach significance ($r=-.59$, $p=.07$), but it was in the inverse direction of that observed in SLI subjects, i.e., LM subjects with higher ratios of production in spontaneous speech tended to have lower ratios of comprehension. This result is most likely due to LM subjects' high rate of correct production of the possessive 's, rather than to any specific correlation between production and comprehension.

Normally developing 5-year olds (age matches) were very accurate in discriminating between possessives and containers and their contrasting compounds. SLI subjects and their language matched peers performed at chance levels when presented with the contrasting pairs. LM subjects were significantly better than SLI subjects in discriminating between possessives and compounds, but they were still allowing a compound interpretation to possessives at high levels.

DISCUSSION

When presented with an adjective modifying a possessor such as in the phrase "the yellow horse's signs", both SLI and LM subjects allowed the adjective to modify the noun "signs", suggesting that they optionally interpret the possessive phrase "horse's signs" as a type of compound noun. In a forced choice task, again both SLI and LM subjects optionally interpreted two-noun sequences as compound constructions, whether or not they contained the possessive 's or the dummy preposition *of*.

Because in about half of the time both groups were able to give adult interpretation to these phrases, it seems clear that they can fit two-noun strings in separate NP's and not only in compound constructions. Such ability would suggest that both groups can project full DP's (including specifier position) so that no NP would remain Caseless. Though children with SLI showed this optionality both in comprehension and production, their language matches did so only in comprehension as they were highly accurate in providing possessive 's in spontaneous language production. Such discrepancy suggests that LM subjects are at a more advanced stage: When they are producing their own possessive phrases, ambiguous interpretation is not possible and Case marking is obligatory. In the case of children with SLI, the optionality is apparent in both production and comprehension possibly due to a limitation in their ability to project fully

hierarchical phrases (in this case the DP) regardless of their own interpretation. Clearly, children with SLI show difficulty not only with the verbal system but also with the nominal system.

Further research is clearly necessary to determine if the productive and comprehensive difficulties of children with SLI are related to a structural deficit in their grammar. Results from this study suggest that this may be a promising line of research and that examination of both production and comprehension should be pursued.

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