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AUTHOR Bookbinder-Brown, Susan J.; Dimmick, Kenneth D.
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ABSTRACT

Previous studies dealing with the age at which children acquire constituent order preferences have been in conflict. This study was designed to determine if children with normal language development demonstrate constituent order preferences as early as age three and one-half, or a mean age of four years, one month. To test this competency, an imitation task was presented to 15 subjects. Four constituent order sentence types were used: subject-verb-object (SVO), subject-object-verb (SOV), object-verb-subject (OVS), and object-subject-verb (OSV). Subjects exhibited fewer errors, shorter repetition times, and shorter lag times on well-ordered sentences than on permuted sentences, demonstrating constituent order preferences at this early age. (Author)

The Acquisition of Major Constituent Order Rules in English

Susan J. Bookbinder-Brown
San Diego State University
Department of Speech Pathology
San Diego, California 92115

Present place of employment:
Cajon Valley School District
189 Roanoke Road
El Cajon, California 92020

Kenneth D. Dimmick
Professor, San Diego State University
Department of Speech Pathology
San Diego, California 92115

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Acquisition of Major Constituent Order Rules

Susan J. Bookbinder-Brown, 4734 Edgeware Road, San Diego, CA 92116

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Susan J. Bookbinder-Brown and Kenneth D. Dimmick

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ABSTRACT

Previous studies dealing with the age at which children acquire constituent order preferences have been in conflict. This study was designed to determine if children with normal language development demonstrate constituent order preferences as early as age three and one-half, or a mean age of four years, one month. To test this competency, an imitation task was presented to fifteen subjects. Four constituent order sentence types were used: subject-verb-object (SVO), subject-object-verb (SOV), object-verb-subject (OVS), and object-subject-verb (OSV). Subjects exhibited fewer errors, shorter repetition times, and shorter lag times on well-ordered sentences than on permuted sentences, demonstrating constituent order preferences at this early age.

THE ACQUISITION OF MAJOR CONSTITUENT ORDER RULES IN ENGLISH

Research indicates that a child's knowledge of major constituent order is fundamental to his overall language development (Marks and Miller, 1964). While knowledge of constituent order is clearly derived from linguistic experience, it has not been established at what age normal children demonstrate this competency. Previous elicited-imitation studies (Scholes, 1969; Rodd and Braine, 1970; and Love and Parker-Robinson, 1972) that tested constituent order preferences in young children have yielded conflicting evidence regarding the time of onset of this competency.

Scholes (1969) found his least linguistically mature group (median age 3 years, 9 months) to make an equal number of errors when imitating grammatically and ungrammatically ordered sentences. In contrast, his most linguistically mature group (median age 4 years, 11 months) made over twice as many errors on ungrammatical as on the grammatical sentences. He concluded that knowledge of constituent order is amassed gradually by children, and is firmly established by approximately age 5.

Rodd and Braine (1970) and Love and Parker-Robinson (1972) found evidence of constituent order preferences in children's imitations by age 2 years, 6 months (Rodd and Braine) and age 4 (Love and Parker-Robinson) respectively.

The present study differs from the previous studies in terms of four experimental controls which had not been utilized in combination before. These were the screening of all prospective subjects (Ss) for normal syntax development; the selection of appropriate vocabulary, subject matter, and sentence structure for the preschool child; the provision of contextual

support during the imitation procedure; and the limitation of stimulus sentence length.

The experimental task involved the repetition of sentences composed in four different constituent orders: Subject-Verb-Object (SVO), as in "Snoopy wants to find some food"; Subject-Object-Verb (SOV), as in "George two front teeth has"; Object-Subject-Verb (OSV), as in "Cookies Snoopy likes to eat"; and Object-Verb-Subject (OVS), as in "A hot dog wants to eat George."

If normal three and four-year-old children have acquired a knowledge of the dominant constituent order in English (SVO), they should make fewer imitation errors on correctly ordered sentences than on permuted sentences. If they have not yet attained this competency, one would expect them to perform equally well on all four constituent order groups. Further, if this competency does exist, one might expect the Ss' repetition speeds and response latencies to be shorter on well-ordered sentences than on permuted sentences.

PROCEDURE

Fifteen Ss between the ages of 3 years, 6 months and 4 years, 5 months were selected to participate in the study. The children either attended a preschool or day care center, or were children of friends of one of the authors. Selection was based upon their scores on the Northwestern Syntax Screening Test (NSST). All Ss achieved the rank of 50th percentile or greater on the receptive and expressive portions of the test combined.

The NSST presentation was modified in order to sustain the interest of this age group. The test pictures were cut out and mounted on felt squares in order that the black and white drawings were bordered in

colored felt. The examiner used a 12" x 12" burlap board as a story board and mounted the felt-backed picture stimuli, item by item, in the same relative position as they appear on the pages of the NSST loose-leaf binder. Apart from the colorful mounting, the test was administered under standard conditions. The screening test was completed in one or two sessions, depending upon the attention span of the child.

Sentence Stimuli

The stimuli consisted of 28 sentences ranging in length from 3 to 6 words. The sentences had a mean length of 5.1 words per utterance. The 28 sentences were divided equally among the four constituent order groups: SVO, SOV, OSV, and OVS. Each of the four constituent order groups contained the same syntactic constructions and approximately the same total number of words.

The choice of these four constituent orders was based on Paula Menyuk's (1969) discussion of children's violations of orderings in strings. SVO represents the dominant constituent order in English. SOV represents the dominant order in numerous languages other than English. OSV, though not generally a dominant order in any of the world's languages, was the primary violation of constituent ordering observed by Menyuk. OVS is neither a dominant order, nor is it a violation of syntax that has been documented in children's language.

Beyond constituent order considerations, the sentences were formulated to include vocabulary and subject matter common to the preschool age child (Gates, 1935). Four-fifths of the words used to make up the stimulus sentences were among the top 500 words contained in Gates' list of reading vocabulary for the primary grades. (Gates' words were chosen on the basis

of their relevance to young children's communication needs.) In terms of grammar and sentence structure, all sentences were in the present tense and all were of the Subject-Verb-Object type before permutation.

Based upon the finding by Slobin and Welsh (1968) that imitation with contextual support represents a truer estimate of children's linguistic competencies than imitation without such support, contextual support was provided for the sentence stimuli to be imitated. Support was achieved through the use of two puppets, worn by the examiner and S, that are commercially available in the Level I Peabody Kit (Dunn and Smith, 1966). The puppets were the subjects of all stimulus sentences and were used to reinforce the meaning of the sentences whenever possible.

Methods

Each subject was presented with the experimental task individually in a quiet room. The child was seated near a Wollensak 3-M cassette tape recorder (model 4300) and allowed to put on one of the two puppets while the examiner put on the other puppet. The child was introduced to the imitative nature of the task with the following instructions: "I'm going to have my puppet say something. I want you to have your puppet say the same thing." A familiarization task, consisting of the following four sentences, was then presented;

Say:

1. "This is a dog."
2. "A dog this is."
3. "This is a dragon."
4. "A dragon is this."

During the familiarization task, a second presentation of the stimulus

sentence was given if the child reversed the order or omitted any of the words. In such instances the author would say, "No, say just what I say: (repeat stimulus)." The familiarization task was taped and played back immediately to acquaint the child with the function of the tape recorder, and to further "motivate" him or her to participate in the experiment.

When the child was acquainted with the procedure, the examiner started the tape and began presenting the sentences in live voice. The order of presentation was such that no two consecutive sentences used the same constituent order. The sentences were read with normal intonation for an English statement.

Scoring

The children's taped imitations were scored in terms of four types of errors: Deletion, addition, replacement, and metathesis. These categories, identical to those used by Scholes (1969), were defined by him as follows:

Deletion errors are those cases where some word or words in the model are omitted in the imitation. Addition errors are cases where some word or words not in the model occur in the imitation. Replacement errors are those cases where some word or words in the model are replaced by some word or words in the imitation. The words must be obviously related in terms of lexical classes or meaning to be scored as replacements. Metathesis errors are cases where the order of some words in the model have been changed in the imitation (1968).

In addition, two "time" measures were used to evaluate subjects' responses. The first was designated as total response latency per constituent order, and was defined as the amount of time between the close of

the stimulus presentation and the onset of the subject's imitation for each constituent order group. The second "time" measure, identified as the total repetition time per constituent order group, was the sum of the subject's repetition times for the seven sentences of each constituent order group. This measure was calculated from the first word of the child's imitation to the final word. The timed events were measured with a Hanhard Amigo/Tristop stop watch that is accurate to 1/10 second.

The experimental task took between 10 and 15 minutes to complete. If a child failed to respond to a given stimulus, the investigator would first prompt the child by asking, "Can you say that?" If there was still no response, the stimulus was repeated until the child ventured a response. On an item for which more than one stimulus was given, the response latency was calculated from the end of the first stimulus to the beginning of the child's response, minus the time required for additional stimulus presentations.

RESULTS

A major question of this study was, do three and four-year-old Ss possess a knowledge of English constituent order that would differentially affect their error rate during imitation of the four constituent orders? The data were evaluated by the Wilcoxon matched-pairs, signed-ranks test (Siegel, 1956). As shown in Table 1, subjects' error rates during imitation of SVO constituent order sentences were significantly lower than error rates during imitation of SOV, OSV, and OVS sentences. This was significant beyond the .005 level of confidence in all cases. The data suggest that three and four-year-old Ss have far greater accuracy repeating sentences in the dominant constituent order of their language, SVO, than in non-dominant orders.

A second question of this study involved the effect of this competence

upon sentence repetition time per constituent order group. A set of Wilcoxon analyses indicated that Ss required significantly less time to imitate SVO constituent order sentences than to imitate sentences utilizing the three permuted orders. Confidence levels for SVO shorter repetition time was .005 compared with SOV and OSV, and .025 for SVO compared with OVS (Siegel, 1956). Table 1 contrasts Ss' total repetition times by constituent order group.

A final series of Wilcoxon tests examined the influence of the four constituent orders on total latency of response per constituent order. Results indicated that total response latencies for SVO sentences were significantly shorter than response latencies for SOV, OSV, and OVS sentences. This was true at the .01 level for SVO compared with SOV, and at the .05 level in the cases of SVO compared with OSV and OVS (Wilcoxon and Wilcox, 1954). A comparison of Ss' total response latencies per constituent order group is presented in Table 1.

Results of the three sets of Wilcoxon analyses give strong evidence of young children's knowledge of English constituent order. Both the scant number of errors produced and the short repetition times and response latencies required to reproduce SVO sentences underscore the competence of young children in predicting and efficiently processing well-ordered English sentences.

DISCUSSION

This study controlled a number of variables uncontrolled in previous studies. It involved 15 Ss, a number larger than in any previous study. It included the screening of Ss for normal syntax development, which neither Scholes (1969) nor Rodd and Braine (1970) did; because no inferences about the linguistic competencies of normal children can be made without first

Table 1
 Summary of Children's Responses in Terms of Errors,
 Latencies, and Repetition Rates for **BEST COPY AVAILABLE**
 Four Constituent Orders

	Constituent Orders			
	SVO	SOV	OSV	OVS
Total Errors for All Ss per Constituent Order	9	127	65	42
Total Latency Times for All Ss per Constituent Order (in seconds)	218.4	297.3	259.8	173.5
Total Repetition Times for All Ss per Constituent Order (in seconds)	215.6	265.8	263.9	233.1

gathering data from children with normal language. Thirdly, it provided contextual support to the Ss during the imitation task, in accordance with Slobin and Welsh's finding (1968) that contextual support yields the truest estimate of children's linguistic competencies. And finally, it utilized sentence stimuli in which the vocabulary, subject matter, and sentence structure were well within the repertoire of the preschool child. (This was a departure from Scholes' study, in which at least some of the sentences involved the passive transformation, a structure not regularly seen in the preschool child's expressive corpus.)

In light of these controls, the authors feel justified in asserting that English constituent order rules are present earlier than a previous study (Scholes, 1969) indicated. Our Ss, age 3-6 to 4-5, mean age 4-1, demonstrated this knowledge as early as age 3-6, upholding the results of Love and Parker-Robinson (1972), and Rodd and Braine (1970). The age range of our Ss did not extend as low as did Rodd and Braine's, so we are unprepared to state if two and one-half year olds also have this competency. In any case, our data suggest that the age of onset of constituent order rules, 3 years, 6 months (or earlier), is significantly lower than the age reported by Scholes (1969) of approximately 5 years.

This discrepancy may have resulted from Scholes' choice of sentence stimuli. Although he did not report the exact composition of his sentences, the one example which he did present made use of the passive transformation. A review of the Northwestern Syntax Screening Test results on the 15 Ss chosen for this study showed that over half the passive items on the NSST were missed by this population of "normal" subjects. If this transformation is not stabilized in young children's competencies, then it is reasonable to expect that they would have had as much trouble imitating it

as imitating its permutations.

Another finding of this study was that the children exercised grammatical rules besides those of constituent order in processing the sentence stimuli. One such rule that appeared to be operative in this age group involved subject-verb number agreement. Given a sentence like

"HIS HANDS HAS TO WASH GEORGE (OVS stimulus),"

many subjects altered the verb "has" to make it agree in number with "hands," the word occupying the subject position of the sentence: For example,

"His hands have to wash George."

This evidence of the subject-verb number agreement rule in young children's grammars is consonant with Keeney and Wolfe's (1972) finding that 3 and 4 year olds use this rule expressively, and tend to spontaneously correct sentences that violate it during imitation.

Another grammatical rule that nearly all the Ss utilized was the possessive form. Given a stimulus like:

"GEORGE HIS EYES CAN HIDE (SOV stimulus),"

most Ss produced the following type of imitation:

"George's eyes can hide."

This replacement strategy, beyond documenting young children's knowledge of the possessive, gives support to Menyuk's hypothesis regarding children's tolerances for order violations in sentences. After studying children's spontaneous usage of constituent order, Menyuk (1969) formulated the following hypothesis to explain which permutations were acceptable to them and which were not: ". . . Subject + Verb with Object position optional." She felt that subject-main verb proximity was essential to the preservation of meaning and that this rule dictated which permutations were

to be found in children's spontaneous speech and which were not. In this study, by presenting the Ss with SOV sentences, the authors created a set of stimuli in violation of this rule. Confronted by these aberrations, the Ss tended to alter them to conform to Menyuk's rule.

As valid as Menyuk's observations appear in the case of SOV imitations, they do not deal with the possibility that children process in terms of form class order rather than constituent order. In this study the permuted order OVS, which conserved the same form class sequence as SVO, i. e., NP+VP+NP, proved the easiest of the permuted orders for the Ss to imitate accurately. This is consonant with Scholes' finding (1969) that ". . . anomalous sentences are as easy to imitate correctly as meaningful ones. . . ." Repetition and response latency times were still significantly longer for OVS than SVO sentences. However, these time differences may be accounted for in that the children often had to apply the additional noun-verb number agreement rule to rectify the utterances. A more definitive study of children's ordering preferences needs to be done to distinguish between constituent order preferences and form class order preferences.

SUMMARY

Previous studies dealing with the age at which children acquire constituent order preferences have been in conflict. This study was designed to determine if children with normal language development demonstrate constituent order preferences as early as age three and one-half, or a mean age of four years, one month. The data conclusively demonstrate constituent order preferences at this early age.

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