



COMPREHENSION OF SELECTED LINGUISTIC CONSTRUCTIONS BY  
NORMAL 36 TO 66 MONTH OLD CHILDREN AND 72 TO 144  
MONTH OLD MENTALLY RETARDED CHILDREN

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Language assessments of children and adults have been predicated upon test scores that enables a practitioner to profile relative strengths and weaknesses in verbal and nonverbal language. Useful as they were, these efforts failed to explain or describe how an individual used verbal language. Linguistics has provided Speech Pathology with the vehicle for combining objective indices of verbal and nonverbal language with descriptions of how spoken language is used. However, this new means of adding precision to language evaluations and subsequent therapy is not without problems, the major one being an absence of a standard for acquisition of selected linguistic constructions (Bellugi, 1968). This study was conducted to obtain normative data on how children understand the following three aspects of spoken language: (1) left to right word patterns, (2) word regularities, (3) word relationships. Ten different syntactic constructions were selected in order to test the deep and surface relationships among the various elements.

Subjects

The data was gathered from 75 children in nursery schools in Lincoln, Nebraska. The children were divided into six month intervals, ranging from 36 to 66 months. Five boys and five girls at intervals of 42, 48, and 66 months, ten boys and ten girls at 54 and 60 months, three boys and two girls at the interval of 36 to 41 months were tested. Criteria for the selection of children were chronological age within two months of the established six months intervals, absence of any known emotional, neurological, or sensory (visual problems correctable by glasses were acceptable) problems, teacher affirmation that the child's language performance was comparable to that of similar age children. In addition, 62 educable and trainable mentally retarded children (37 males and 25 females) with chronological ages varying from 72 to 138 months were given the same tasks.

Each of the 137 subjects was required to demonstrate comprehension of the different linguistic constructions by manipulating

small objects in a specific manner. Words used for all test items were selected from word frequency lists showing them to be within the expected vocabulary of a preschool child. Furthermore, the clinician identified each key item as it was presented. The following directions were given to all children:

"I am going to show you some toys. These toys can do many things. I will show you what they do. When I ask you to show me, you do what I have done. Are you ready?"

At that point, two demonstration items were presented. Upon satisfactory completion of the demonstration items, each child then was told:

"I am going to say something that the toys can do. I want you to make the toys do what I say."

Each stimulus item then was presented aurally and the child was required to give a nonverbal response (manipulation of the objects). Verbalization was discouraged.

### Stimuli

Only those items pertaining to the immediate sentence were presented and arranged in a manner that provided no situational cues. Twenty examples of each of the following syntactic construction were presented:

- 1 Action Constructions required the child to understand the relationship between subject and object of an active transitive verb.

The dog chased the horse  
The horse chased the dog

- 2 Singular-Plural Noun Inflection required the recognition of the plural morpheme in nouns.

Give me the car  
Give me the cars

- 3 Singular-Plural Verb Inflection required the child to understand the relation between singular-plural subjects and the verb.

The girl walks  
The girls walk

- 4 Passive Constructions required understanding of the notion of deep structure object roles and their relationship to the surface word order of the passive sentences

The horse is chased by the dog  
 ~The dog is chased by the horse

- 5 State Constructions required the child to comprehend that the noun was in a state described by the adjective or past participle in the sentence. While all of these sentences had some form of "be," half of them had other auxiliaries such as "can," and "have "

The baby is covered  
 The dress is clean

- 6 Negative State Constructions required the comprehension of a negative state signaled by negative morpheme "not" attached to the auxiliary

The baby is not covered  
 The dress is not clean

- 7 Negative Contractions required the contraction of negative morpheme "not" in the above stated constructions

The baby isn't covered  
 The dress isn't clean

- 8 State Constructions with Negative Affix were a test for the child's understanding of negative prefix "un-" added to the adjective or past participle describing a state

The baby is uncovered  
 The dress is unclean

- 9 Negative State with Negative Affix required the child to interpret the co-occurrence of the negative morpheme attached to the auxiliary with the negative affix, prefixed to the adjective or past participle

The baby is not uncovered  
 The dress is not unclean

- 10 Negative Contraction with Negative Affix required the understanding of contraction form of the negative morpheme attached to the auxiliary verb in the presence of a negative affix

The baby isn't covered  
The dress isn't unclean

### Results

The intent was to use that information for clinical comparisons. However, the results of the study lead to some interesting observations about the nature of language learning and the relevance of the linguistic theory proposed by Chafe (1970). For the normal children, simple central tendency data was obtained at each age level (Table 1)

Table 1 Mean percentage correct scores for the normal children according to age level on each syntactic construction (N=75)

<u>Sentence Type</u>	<u>Age in Months</u>					
	<u>36</u>	<u>42</u>	<u>48</u>	<u>54</u>	<u>60</u>	<u>66</u>
1) Action Constructions	82	80	94	98	100	99
2) Singular/Plural Noun Inflection	84	85	92	95	100	100
3) Singular/Plural Verb Inflection	78	78	84	93	96	100
4) Passive Constructions	45	58	73	76	82	86
5) State Constructions	91	92	99	98	99	99
6) Negative State Constructions	78	79	95	96	95	95
7) Negative Contractions	67	58	86	94	95	97
8) State Contractions with Negative Affix	46	45	57	47	67	64
9) Negative State with Negative Affix	15	11	24	26	33	40
10) Negative Contractions with Negative Affix	23	13	20	26	33	49

The trend of increasingly higher scores with older children was obvious. Also, it can be seen that a hierarchy of apparent difficulty existed, in which the easiest items were state constructions followed by singular/plural noun inflection. The most difficult items were the negative state with negative affix. The following specific comments are made about Table 1.

Children at all age levels comprehend the action constructions well. They understand the relationships between a verb and its agent and patient.

Children at the age levels tested had high comprehension for the notion of noun plurality as signalled by /s/ and /z/. However, this performance, the comprehension for inflectional endings, did not carry over to verbs until the children were 54 months of age.

Passive constructions were among the most difficult to comprehend for all of the normal children. In contrast, understanding of state constructions usually is achieved by children 36 months of age. It is noteworthy that the subjects might have performed even better if the auxiliaries, such as can and have, were eliminated from the stimuli.

Comprehension of the negative state was comparable to understanding of state constructions by the time children were 48 months of age. Interestingly, comprehension of the negative constructions also reached a reasonably high level (86 per cent correct) at the same time. However, the younger children (36 and 42 months) did show some apparent difficulty with the constructions.

State constructions with the negative affix un- were understood between 45 and 67 per cent of the time by children at all of the age levels tested. It was interesting to note that children 60 months correctly responded to between 12 and 14 of the 20 sentences, but college trained adults considered only 10 of the 20 sentences as acceptable. Certainly this argues for a closer examination of the test stimuli, and might mean that comprehension is dependent upon factors other than recognizing surface structure relationships.

The central tendency scores reported in Table 1 show that, predictably, children could comprehend only a small number of negative state with negative affix sentences. The difficulty understanding these constructions probably was related to interpreting the un- affix in relation to the words to which it was added, and

to the complexity of the selected linguistic constructions. Contrary to a commonly accepted belief that contractions are very complex grammatical structures, the data in Table 1 shows children understood the negative contraction with negative affix sentences as well or better than the negative state with negative affix sentences.

A direct comparison between the percentage of correct scores earned by the normal preschool children and the mentally retarded subjects is misleading because of the variations in chronological ages between the two groups. Table 2, below, presents data that shows the range of chronological ages of the mentally retarded children. It should be noted that the normal preschool children ranged in age from 36 to 71 months.

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Table 2 Number of mentally retarded subjects according to their chronological ages

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<u>Chronological age in months</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>
72 - 84	9	5	14
85 - 97	10	7	17
98 - 103	8	4	12
108 - 115	5	4	9
118 - 122	4	1	5
124 - 142	1	4	5
Total	37	25	62

Range 72 - 142 months  
 Mean 114 months

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Extensive chronological age differences created ambiguity when attempting to interpret the data, until the mentally retarded

subjects were grouped according to their respective mental age levels (Table 3)

Table 3 Number of mentally retarded subjects according to mental age levels

<u>Mental age in months</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>
36 - 42	10	10	20
43 - 49	5	3	8
50 - 56	10	9	19
57 - 63	8	3	11
64 - 70	4	-	4
Total	37	25	62
Range	36 - 66 months		
Mean	49 months		

Table 3 shows that despite the wide chronological age variation (72 - 142 months) the mentally retarded subjects could be grouped reasonably well by mental ages. The range actually was highly comparable to the chronological ages of the normal children. It is important to recognize that no effort was made to determine if the higher mental age levels were associated with the chronologically older retarded children. Using the mental age groupings, as shown in Table 3, the mean percentage of correct responses to each linguistic construction was determined (Table 4). The data show (Tables 1 and 4) that the retarded children generally paralleled the performance of the normal preschool children, but at a noticeably slower rate. The lag in comprehension of the selected linguistic constructions among the retarded children apparently was not a uniform phenomenon, since several types of sentences were consistently easier to understand. This pattern was similar to the one noted for the normal subjects. The greatest percentage score differences between the two populations occurred when the test sentences had unusual subject-verb-object order and when transformations were made.

Table 4 Mean percentage correct scores for the mentally retarded children according to mental age level on each syntactic construction (N = 62)

<u>Sentence Types</u>	<u>Age in Months</u>				
	<u>36-42</u>	<u>43-49</u>	<u>50-56</u>	<u>57-63</u>	<u>64-70</u>
1) Action constructions	53	64	80	93	99
2) Singular/plural noun inflection	53	68	71	86	93
3) Singular/plural verb inflection	49	58	73	85	96
4) Passive constructions	51	47	65	81	94
5) State constructions	39	54	51	53	71
6) Negative state constructions	33	48	62	79	81
7) Negative contractions	19	25	31	34	50
8) State contractions with negative affix	10	15	25	47	81
9) Negative state with negative affix	12	22	19	24	24
10) Negative contractions with negative affix	11	21	17	21	15

A striking fact observed was that when the mentally retarded children reached the mental age equivalent of 57 months or older their performance approximated that of the normal preschool children of a comparable chronological age. This was the most notable for the action constructions, singular/plural noun inflections, singular/plural verb inflections, and passive constructions. State constructions, which were easiest for all normal children, unexpectedly were difficult even for the 64-70 month group of mentally retarded children.



### Discussion

The data indicates that the simplest syntactic construction for normal children to comprehend is the State Construction, next is what we have called the Action Construction. The sentences used for plural-singular constructions were aimed at testing the comprehension of the plural morpheme in nouns, but it should be recognized that they involved the simultaneous comprehension of Imperative Constructions. Sentences dealing with plural verb inflection contained intransitive verbs and thus required the understanding of the notion of agent or actor.

The sequence for easier comprehension of the selected linguistic construction samples by this study were State, Action, Noun Inflection, Verb Inflection. This hierarchy is discussed in the linguistic theory proposed by Wallace L. Chafe (1970), in his book, Meaning and the Structure of Language. Chafe claims that the total human conceptual universe is dichotomized into two major areas of verbs and nouns. The verb, which is the central element of the sentence, embraces states and events. State verbs hierarchically come before the other types of verbs. When a verb is not a state it is a process and/or action. The construction types 1, 2, 3, 4, 5, fall into Chafe's State (type 5), Action (type 3), and Process-Action (type 1), and state constructions (type 5) were the most readily comprehended by all children. Negative State (type 6) followed closely after Active Constructions (type 1), and singular-plural Noun Inflection (type 2). The mean scores for the rest of the constructions were relatively low, even for the older children.

When the other linguistic constructions were evaluated it was observed that the data was in accord with the observations that Passives were acquired later than Active sentences. An obvious question that arises is why do children do so much poorer on passives when they comprehend the transitive verb constructions (type 1 constructions) very well. Re-stated, the question is why should they have difficulty with this pattern, especially if there is no meaningful difference between the passive and active forms of the same sentence? If the process of language learning is viewed from a non-behavioristic point of view, it is seen that grammar is a set of rules that match sounds and meaning. Children acquire these rules in a sequence. The more basic rules needed for matching of meaning to sounds are learned first. If we subscribe to Chafe's ideas that rules dealing with semantic notions of verbs are developed earliest, (i.e., state, process, action, etc.) and these verbs influence the function and selection of any accompanying nouns,

(i e , patient, agent, etc ), other rules, such as tense agreement in verbs, are developed later as are optional stylistic rules. It can be conjectured that either the semantic content of these later developed rules are not as essential, or there are alternative methods available to children for matching the semantic element to sound patterns. This study provided two examples of later developing rules, Passive and State Construction with Negative Affix

Passive transformations, contrary to accepted belief, do have a semantic content. Chafe (1970, p. 219) explains that the meaningful difference between active and passive sentences has to do with the semantic notions of old and new information. However, it is obvious that children can convey the same information through the use of other rules of grammar at their disposal, namely, the phonological rule of STRESS. The syntactic construction used in passives need not be learned as early as other basic rules. This we believe could account for the poor performances on the Passive Constructions (type 4).

Another noteworthy fact was the generally low mean scores for State Construction with Negative Affix sentences (type 8). Several explanations for this fact are possible. Slobin (1971) suggested that affixes are learned at a later stage of acquisition. This might be the case with the negative prefix un-. However, in this case, we should recognize two different factors: (a) the semantic content of the prefix, and (b) the co-occurrence restriction between the prefix and the word to which it is added. It is the latter restrictions that seem to have given us the low scores. Semantically speaking, prefix un- negates the word to which it is added and creates an antonym. But syntactically it could be added to a set of special words. Depending on the reaction of children to the semantic factor or to the morphological restriction, they will score differently. A most interesting aspect about this study was that most children reacted to the semantic content of the prefix. The children could accept and interpret the sentences with un- with greater frequency than adults. It is a fact of language that there is more than one way of saying

Your zipper is open

for example,

Your zipper is unzipped

Likewise, it is semantically reasonable to agree, as children did, that another way of saying

The box is light,

is

The box is unheavy

Most adults reacting to the non-semantic factors, namely the co-occurrence restriction between un- and heavy, did not accept the alternative method

The mentally retarded subjects demonstrated a continuing pattern of acquisition but at an appreciably slower rate of language maturation. Perhaps the notably higher per cent correct scores on certain sentence types reflected that these children had greater familiarity with certain linguistic constructions, as a consequence of limited experience and restricted environments. In addition, consideration needs to be given to the possibility that the retarded children were limited in their ability to process the more complex linguistic structures. This would indicate that the nature of a task, as it relates to the subject and the immediate environment, is important.

The above observations, namely the fact that children reacted to semantically relevant elements of language, leads to the conclusion that Speech Pathologists and psycholinguists should redirect their research efforts toward understanding the semantic structure of language used by children. This would be of paramount importance when structuring language intervention programs.

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