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ABSTRACT

To investigate organizational strategies of educable mentally retarded (EMR) and normal boys, the performance of 30 normal boys (mean IQ 105.1) and 30 EMR boys (mean IQ 69.9), ages 7-12 years, was compared on various free recall learning tasks. Three measures of input organization employed were category clustering, associative clustering, and subjective organization. Subjects were presented with five stimulus lists of 12 words each, and were given 12 trials on each list. Results showed that EMR boys demonstrated less category clustering and recall than normal boys on the categorized list, and less associative clustering and recall on a stimulus list composed of high-associative paradigmatic noun pairs. Difference in recall between the groups on a stimulus list of high-associative syntagmatic word pairs was significantly less than the difference in recall on a list of high-asscciative paradigmatic noun pairs. EMR boys also exhibited significantly less recall than normal boys on stimulus lists of low-associative paradigmatic and low-associative syntagmatic word pairs. (Author/KW)

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INPUT ORGANIZATIONAL STRATEGIES OF EDUCABLE MENTALLY RETARDED AND NORMAL BOYS IN FREE RECALL VERBAL LEARNING

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Several theorists have emphasized the importance of organizational processes in human learning and memory. Considering the significance of the strategies used to process information, it is possible that the inferior learning and short-term memory performance characteristic of retarded children may be due to faulty or inefficient organization of stimulus input. Although this position has been supported (Spitz, 1966), the nature of the organizational deficit in EMR children remains to be determined. The present study attempted to qualitatively analyze organizational strategies of EMR and non-retarded children in processing verbal input. The investigator focussed on a recent model of language behavior of EMR and non-retarded children (Semmel, 1967, 1969) as a guide for exploring the nature of verbal recoding in EMR and normal children.

According to Semmel's position, there is a qualitative difference in the organizational strategies used by EMR and non-retarded children in processing verbal stimuli. Retarded children primarily employ "sequential-associative" strategies, while "sequential-associative" and "hierarchical" strategies seem to be synchronized in normal children. Of the two, sequential-associative strategies are relatively more primitive since they develop as the child experiences associations between linguistic units in a language environment. Hierarchical grammatical and semantic strategies are more abstract, frequently taking the form of rules governing the permissible relationships between linguistic units. Because the generality of such strategies makes them more powerful tools for generating and processing language, they are probably related to more proficient language behavior than are

EC 031 608

sequential-associative strategies.

Eight specific hypotheses derived from this theoretical position were tested through a comparison of the performance of normal and EMR boys of equal CA on various free recall learning tasks. Three separate associative clustering, and subjective organization. It was predicted that EMR boys would demonstrate significantly less recall and clustering (both category and associative clustering) than normal boys of similar age on verbal free recall tasks in which the items were organized into a number of conceptual categories or similar grammatical classes. Similarly, EMR boys were expected to display relatively inferior recall performance on verbal recall tasks composed of low-associative or semantically "unrelated" items. On the other hand, EMR boys were expected to show a high degree of associative clustering, and reveal their best recall performance (relative to normal boys) with verbal stimuli demonstrating both high-associative and sequential relationships. In addition, EMR boys were expected to emit fewer paradigmatic free word-associations than normal boys of equal CA on a free word-association task.

The subject population consisted of two groups of thirty normal and thirty EMR boys randomly selected from two elementary public schools in an urban, working class neighborhood. Table I presents the characteristics of the subjects used in this study. Each S was presented with five separate stimulus lists each composed of twelve verbal items. One list contained three words from each of four mutually exclusive conceptual categories. The remaining four lists were composed of six word pairs, and differed in the degree of associative strength and in the grammatical form class of their items. The five lists are presented in Table 2. Each S was given twelve successive learning trials on the five lists. The position of words within each list was different on each of the twelve trials. The order of presentation of the five lists was randomized among the two groups of subjects and the

five testers who administered the lists. Subjects were tested individually and were administered the five recall lists at separate testing sessions through tape recordings. A twenty item free W-A task was administered to all Ss as soon as testing on the five stimulus lists was completed.

The results supported all eight predictions. EMR boys elicited significantly fewer paradigmatic responses than normal boys of equal CA on the twenty-word free W-A task. EMR boys demonstrated significantly less category clustering and free recall than normal boys of equal CA on the categorized list. In addition, category clustering was significantly related to total recall in each group to a similar degree. EMR boys demonstrated significantly less associative clustering and recall than normal boys of equal CA on a stimulus list composed of high-associative paradigmatic nouns. Paralleling the results for category clustering, both groups demonstrated a significantly positive correlation between associative clustering and total recall. The difference in free recall between EMR and normal boys of equal CA on a stimulus list composed of high-associative syntagmatic word pairs was significantly less than the difference in recall between the groups on a list composed of high-associative paradigmatic noun pairs. Furthermore, EMR boys demonstrated the same degree of associative clustering as normal boys on the high-associative syntagmatic list, and revealed their best recall performance relative to normal boys on this list.

EMR boys demonstrated significantly less recall than normal boys of equal CA on stimulus lists composed of low-associative paradigmatic noun pairs and low-associative syntagmatic word pairs. However, EMR boys demonstrated significantly more subjective organization than normal boys on each of the low association lists when a modified method of scoring subjective organization was used. Neither group exhibited a high positive

correlation between subjective organization and total recall performance. EMR boys did display a moderately high and significant negative correlation between subjective organization and total subjective organization scores between the two groups did not differ significantly. In addition, normal boys exhibited a significant positive correlation between subjective organization and total recall on each of the low association lists. However, subjective organization was not significantly related to total recall in EMR boys on either list.

Both groups have relatively few categorical and irrelevant extralist intrusions on the categorized list. However, over the four paradigmatic and syntagmatic lists, EMR boys introduced a significantly greater number of irrelevant intrusions in their total recall than normal boys. Both groups produced more intrusions on stimulus lists with low-associative rather than high-associative word pairs. Total recall for the five stimulus lists was negatively related to extralist intrusion scores in each group.

EMR boys made significantly more repetitions of correctly recalled words on the categorized list than normal boys. However, there were no statistically significant differences in the number of repetitions made between the two groups over the four paradigmatic and syntagmatic lists. Repetition scores for each list were negatively related to total recall performance for normal boys and positively related to total recall for retarded boys. For both groups, repetitions of correctly recalled words were generally more numerous than the number of extralist words introduced during recall.

The results were examined in relationship to Semmel's language model and to the literature concerning both free recall verbal learning and mental retardation. It was concluded that the investigation lends additional support to Semmel's view of the language behavior of EMR and non-retarded children. Non of the evidence appeared to be in direct

conflict with this view. It appears reasonable to conclude that this investigation lends additional support to Semmel's view of the language of EMR and non-retarded children. None of the evidence appeared to be in direct conflict with this view. It may be concluded that there is a qualitative difference in the organizational strategies used by EMR and non-retarded children in processing verbal stimuli. Retarded Ss primarily employ "sequential-associative" strategies, while "hierarchical" (i.e., semantic and grammatical) strategies seem to be synchronized in non-retarded children. The generality of hierarchical strategies appears to make them associated more with proficient language behavior -- free recall verbal learning in this case -- than are sequential-associative strategies. The findings stand in opposition to Bateman and Wetherall's (1965) contention of a short-term sequential memory deficit in mentally retarded individuals. Rather, the results provide strong evidence that retarded children use primarily "sequential-associative" strategies in processing language.

TABLE 1

CHARACTERISTICS OF THE TWO GROUPS

(N = 30 per group)

Variable		EMR Group	Normal Group
CA (Months)	Mean	115.27	117.00
	SD	15.36	15.37
	Range	88 - 145	87 - 145
I.Q.	Mean	69.90	105.10
	SD	6.50	9.10
	Range	58 - 78	90 - 118

TABLE 2

CATEGORIZED LIST

Categories			
Fruits	Animals	Articles of Clothing	Vehicles
apple	lion	coat	train
banana	tiger	sweater	car
orange	bear	pants	truck

FREE RECALL WORD LISTS

High Associative Paradigmatic (H-P)		Low Associative Paradigmatic (L-P)	
table	chair	sheep	hill
girl	boy	flower	fruit
hand	fingers	milk	cake
mother	father	balloon	fun
bread	butter	door	wall
dogs	cats	city	river
High Associative Syntagmatic (H-S)		**Low Associative Syntagmatic (L-S)**	
bird	fly	fish	cook
toy	play	boat	go
water	drink	man	walk
bed	sleep	soft	sand
green	grass	black	hat
sugar	sweet	cold	floor