DOCUMENT RESUME

ED 113 876 EC 080 110

AUTHOR Wiig, Elisabeth H.; Semel, Eleanor M.
TITLE Language Production Deficits in Learning Disabled Adolescents.
PUB DATE 75
NOTE 16p.; Paper presented at the International Federation of Learning Disabilities (Second International Scientific Conference, Brussels, Belgium, January 3-7, 1975)

EDRS PRICE MF-$0.76 HC-$1.58 Plus Postage
DESCRIPTORS *Cognitive Development; Exceptional Child Research; *Expressive Language; *Language Ability; *Learning Disabilities; Secondary Education; *Speech Skills

ABSTRACT

Evaluated were language production deficits in 32 learning disabled (LD) adolescents. Ss were administered a battery of subtests containing tasks sensitive to language production difficulties in cognition, convergent and divergent production of semantic units, word retrieval, and retrieval of syntactic structures. Results indicated that speech characteristics of LD Ss were close to normal except that phrase length was short and the simple declarative grammatical form was disproportionately used. Other findings showed that LD Ss were significantly deficient in the ability to retrieve accurate verbal opposites, to label pictorial presentations, to name foods, to formulate sentences, and to define words. Results suggested that oral language problems and productive language deficits in younger LD children may persist into adolescence. Findings also suggested a relationship between productive language deficits and delays in development of cognition and retrieval of verbal and syntactic elements. (DB)

LANGUAGE PRODUCTION DEFICITS IN LEARNING DISABLED ADOLESCENTS

Elisabeth H. Wiig and Eleanor M. Semel

Boston University

Learning disabled children have been reported to exhibit oral language problems, characterized by deficits in oral syntax, name and word finding difficulties, and reductions in "verbal fluency" (Bannatyne, 1971; Johnson & Myklebust, 1967; Kass, 1962; Lerner, 1971; Orton, 1937; Rabinovitch, 1959; Vogel, 1974). As possible bases, Johnson and Myklebust (1967), Johnson (1968) and Myklebust (1964) have suggested that learning disabled children retain narrow word meanings, remain concrete and limited in imagery, and exhibit retrieval, sentence formulation, and motor encoding problems. Bannatyne (1971) has related some of the oral language deficits associated with learning disabilities to reduced accuracy and speed of verbal associations and availability of verbal labels.

Recent research has focussed on some aspects of the productive language abilities of learning disabled children (Bartel et al., 1973; Vogel, 1974). There remained, however, a scarcity in investigations which further explored the nature and extent of productive language deficits associated with learning disabilities. Accordingly, a test battery was selected from existing tests of aphasia (Goodglass & Kaplan, 1972; Schuell, 1965) and of learning aptitude (Baker & Leland, 1959). It contained tasks considered sensitive to various language production difficulties in areas such as cognition and convergent and divergent production of semantic units, word retrieval, and retrieval of syntactic structures.

The experimental test battery contained the following subtests: (1) Verbal Opposites (Detroit Tests of Learning Aptitude),

(2) Visual Confrontation Naming (Boston VA Test), (3) an adaptation of the Fluency of Controlled Association subtest (Boston VA Test), (4) Producing Sentences (Minnesota Test for Differential Diagnosis of Aphasia), and (5) Defining Words (Minnesota Test for Differential Diagnosis of Aphasia). In addition, speech characteristics in conversation were rated using the Rating Scale Profile of the Boston VA Test (Goodglass & Kaplan, 1972).

The Verbal Opposites subtest requires accurate naming of antonyms in response to stimulus words such as "brother," "deep," and "expand." The standard test is untimed and testing begins at a basal level. In this study the total response time to ceiling, i. e., five items failed in succession, was added to obtain a measure of speed and testing was started at Item 1.

The Visual Confrontation Naming subtest requires retrieval of verbal labels in response to pictorial presentations of objects, letters, geometric forms, actions, numbers, and colors. In this study the subjects were required to name all pictorial stimuli in rapid succession. Errors were recorded and the total response time measured in seconds.

The Fluency of Controlled Association subtest requires retrieval and naming of as many members of the class Animals as possible within 60 seconds. This subtest was expanded to require naming of class members in three classes, Foods, Animals, and Toys. The additional classes were selected to provide a range in the possibilities for spontaneous grouping (associative clustering) of class members.

The Sentence Production subtest requires that a grammatical

sentence be formulated which incorporates a stimulus word. The stimulus words were "coat," "new," "want," "have," "after," and "belongs." In the present study, the number of agrammatical sentences were scored and the mean word length of each grammatical sentence and the response lag were also measured to assess the complexity of responses indirectly and the speed of formulation.

The Defining Words subtest requires accurate, but comprehensive definitions for the words "robin," "apple," "return," "different," "bridge," "continue," "history," "material," "decide," and "opinion." The definitions were judged by reference to a dictionary.

The Rating Scale Profile of Speech Characteristics requires that six aspects of conversational or expository speech be rated on a seven point scale. The characteristics rated were: (1) Melodic Line (sentence intonation pattern which normally extends over an entire sentence), (2) Phrase Length (the number of words in the longest uninterrupted run of words), (3) Verbal Agility (ease and accuracy of phoneme sequence articulation), (4) Grammatical Form (sentence structure), (5) Paraphasia in Running Speech (word substitutions and insertions of semantically erroneous words and circumlocutions), and (6) Word Finding (the capacity to evoke concept names and provide informational content.

The experimental test battery was administered to 32 learning disabled adolescents, eight females and twenty four males. They ranged in age from 12 yr. 5 mo. to 16 yr. 4 mo. WISC Full-Scale IQs ranged from 87 to 129 (M = 99) and mean grade scores on the

Metropolitan Achievement Tests were 4.7 for Reading, 4.1 for Language, and 4.2 for Mathematics. All exhibited academic retardation of at least one and one half grades in two or more academic areas, normal auditory acuity and articulatory ability, and Peabody Picture Vocabulary scores were within ± 3 mos. of CA. Controls were 32 academically achieving adolescents matched for sex, age, grade level, and IQ.

Comparison of the ratings of speech characteristics indicates that the learning disabled adolescents scored close to normal on all characteristics other than phrase length and grammatical form (Table 1). Their longest phrases contained an average of five words and the sentences were simple declarative with a few exceptions. Five of the learning disabled adolescents rated consistently low on the speech characteristics. They used atypical intonation patterns and produced simple declarative sentences with word substitutions, circumlocutions and an excess of low information words (something, somebody, sometime, somewhere). They also scored lowest on the Verbal Opposites, Controlled Association, and Word Definition subtests.

(Insert TABLE 1 about here.)

Comparisons of the performances on the various subtests of the experimental test battery indicated that the academically achieving adolescents performed significantly better than the learning disabled adolescents on all but two subtests (Table 2).

(Insert TABLE 2 about here.)

On the Verbal Opposites subtest, the learning disabled adolescents showed a significant reduction in the ability to retrieve

accurate verbal opposites. In comparison, the academic achievers performed within age expectations. The learning disabled adolescents also used longer mean response time per item, suggesting reduced speed of retrieval of verbal labels for opposites. Mean response lags of similar durations (ranging from 2.5 to 15 sec.) have been reported for adults with acquired left parieto-occipital lesions (Luria, 1973, p. 158). The learning disabled adolescents made substitution errors on qualitatively easier items. As an example, responses to "brother" (item 4) were frequently "son" instead of "sister." This suggests ability to identify the abstract category to which a stimulus word belonged, but inability to retrive or identify the exact opposite. Verbal paraphasias similar to those exhibited by the learning disabled adolescents are characteristic of adult aphasics with left temporal, parieto-occipital, or parieto-occipital-temporal lesions (Goldstein, 1948; Goodglass & Kaplan, 1972; Luria, 1966, 1973).

On the Confrontation Naming subtest, the learning disabled adolescents exhibited significant reductions in the accuracy and speed with which they labeled the pictorial presentations. They made 67 word substitutions, 39 omissions, and 2 perseverative errors while the achievers made only word substitution errors. Denckla (1974) has reported similar deficits in the accuracy and speed with which younger dyslexic children named pictured objects. Younger dyslexic children tended to circumlocute, a response not observed in the learning disabled adolescents, and to make associative word substitutions similar to those observed in the present learning disabled adolescents. These findings suggest the presence

of subtle dysphasia in association with some specific learning disabilities.

On the Controlled Association subtests, the learning disabled adolescents named significantly fewer foods than the academic achievers. They did not employ obvious grouping strategies to facilitate recall, but tended to name foods at random shifting from one category to another. In comparison, the academic achievers employed obvious associative clustering strategies, grouping the foods by category or in relationship to meals. Both groups showed similar associative clustering tendencies for animals and seemed to name toys at random. These findings suggest that the differences resulted from reduced spontaneous semantic categorization by the learning disabled adolescents. Therefore, they do not contradict previous reports that learning disabled children develop linguistic categorization rules at expected ages (Bartel et al., 1973).

On the Sentence Production test, the learning disabled adolescents exhibited reductions in the speed and accuracy with which they formulated sentences. Agrammatical sentences formulated with the stimulus word "after" accounted for 11 of their 19 errors. The remaining agrammatical sentences were formulated with the word "belongs." All but four of their grammatical sentences were simple declarative and 68 sentences were started with the pronoun "I." Only three sentences contained a subordinate clause and one was an interrogative. In contrast, the controls produced a total of 27 sentences which contained co-ordinated and subordinated clauses (complex sentences), two interrogative sentences, and two negative sentences. They started 32 sentences with the pronoun "I." The

response lags may have been caused by internal rehearsal of the stimulus words as suggested by the fact that two learning disabled adolescents rehearsed the stimuli overtly during the delay. The delays may also reflect inability to retrieve an appropriate syntactic structure when given the syntactic and semantic constraints imposed by the stimulus word.

The learning disabled adolescents were also significantly poorer at defining words than the academically achieving controls. They frequently provided a function to define a noun. As examples, "apple" and "history" were often defined as "something you eat" and "something you learn in school," respectively. At other times, they provided a derivation such as "decision" to define a word such as "define." The five relatively abstract words "bridge," "history," "material," "decide," and "opinion" were all defined incorrectly by 22 of the learning disabled adolescents, but by only two of the academic achievers. The definitions given by the learning disabled adolescents suggested abstraction of limited, concrete aspects of the concepts while abstract, general aspects were overlooked.

The present findings suggest a relationship between productive language deficits in learning disabilities and (1) delays in the development of specific aspects of cognition and convergent and divergent production of semantic units and (2) reductions in the retrieval of verbal labels and syntactic structures (Goldstein, 1948; Goodglass & Kaplan, 1972; Guilford, 1967; Luria, 1966, 1973; Schuell, 1965). These findings support previous observations of oral language problems in children with learning disabilities

(Bannatyne, 1971; Johnson & Myklebust, 1967; Kass, 1962; Lerner, 1971; Orton, 1937; Rabinovitch, 1954; Vogel, 1974). They also suggest that productive language deficits associated with learning disabilities may persist into adolescence.

Productive language deficits have implications for academic achievement in reading, writing, and arithmetic, among others. It has been stressed that the successful acquisition of reading and writing depends upon adequate oral language (Johnson & Myklebust, 1967). The present results therefore suggest a need for early screening and identification of productive language deficits and emphasis on language production abilities in the educational management of the learning disabled child and adolescent.

The productive language deficits observed in the present learning disabled adolescents may be related to previously observed difficulties in language processing associated with learning disabilities (Wiig & Semel, 1973, 1974; Vogel, 1974). One can subdivide the information storage process into three parts: (1) the act of storing, (2) the holding of information in storage, and (3) the retrieval of information. Each of the parts of the process may provide a source of impairment or error. Reduced comprehension of language, e. g., linguistic structures, linguistic concepts requiring logical operations, etc., may interfere with the act of storing and consequently with the availability of information (semantic or syntactic) for retrieval. In this vein, deficits in the accuracy and speed of convergent and divergent production of semantic units, confrontation naming, and sentence

formulation may reflect receptive language problems in learning disabilities.

REFERENCES

Baker, H. J., & Leland, B. Detroit Tests of Learning Aptitude. Indianapolis: Test Division of Bobbs-Merrill, 1959.

Bannatyne, A. Language, reading, and learning disabilities. Springfield: Charles W. Thomas, 1971.

Bartel, N. R., Grill, J. J., & Bartel, H. W. The syntactic-paradigmatic shift in learning disabled and normal children. J. Learning Disabilities, 1973, 6, 59-64.

Denckla, M. B. Naming of pictured objects by dyslexic and non-dyslexic "MBD" children. Paper presented at the Academy of Aphasia, 1974.

Goldstein, K. Language and language disorders. New York: Grune & Stratton, 1948.

Goodglass, H., & Kaplan, E. The assessment of aphasia and related disorders. Philadelphia: Lea & Febiger, 1972.

Guilford, J. P. The nature of human intelligence. New York: McGraw-Hill, 1967.

Johnson, D. J., & Myklebust, H. R. Learning disabilities: educational principles and practices. New York: Grune & Stratton, 1967.

Johnson, D. J. The language continuum. Bulletin of the Orton Society, 1968, XVIII, 1-11.

Kass, C. E. Some psychological correlates of severe reading disability. Unpublished doctoral dissertation. Univ. of Illinois, 1962.

Lerner, J. Children with learning disabilities. Boston: Houghton Mifflin, 1971.

Luria, A. R. Higher cortical functions in man. New York: Basic Books, 1966.

Luria, A. R. The working brain. New York: Basic Books, 1973.

Myklebust, H. R. Learning disorders: psychoneurological disturbances in childhood. Rehabilitation Literature, 1964, 25, 354-360.

Orton, S. T. Reading, writing, and speech problems in children. New York: Norton, 1937.

Rabinovitch, R. D. Reading and learning disabilities. In S. Arieti (Ed.) American handbook of psychiatry. New York: Basic Books, 1959.

Schuell, H. Minnesota Tests for Differential Diagnosis of Aphasia. Minneapolis: Univ. of Minnesota Press, 1965.

Vogel, S. A. Syntactic abilities in normal and dyslexic children. J. Learning Disabilities, 1974, 7, 47-53.

Wiig, E. H., & Semel, E. M. Comprehension of linguistic concepts requiring logical operations by learning disabled children. J. Speech Hearing Research, 1973, 16, 627-637.

Wiig, E. H., and Semel, E. M. Logico-grammatical sentence comprehension by adolescents with learning disabilities. Perceptual Motor Skills, 1974, 38, 1331-1334.

TABLE 1. Ratings of Speech Characteristics in Conversation by 32 Learning Disabled and 32 Academically Achieveing Adolescents.

Speech Characteristic	Learning Disabled		Achievers	
	Mean	Range	Mean	Range
Melodic Line	6.34	4 - 7	7	-
Phrase Length	5.22	3 - 7	7	-
Articulatory Agility	6.34	3 - 7	7	-
Grammatical Form	4.94	4 - 7	7	-
Paraphasia in Running Speech	6.13	2 - 7	7	-
Word Finding	4.22	2 - 7	4*	-

* 4 denotes 'information proportional to fluency.'

TABLE 2. Summary of Test Performances by 32 Learning Disabled and 32 Academically Achieving Adolescents.

Test	Mean	Range	SD	χ^2
Verbal Opposites:				
Age Scores (Raw Scores):				
Learning Disabled	11-1 (44.5)	9-0 - 15-0 (30 - 60)	1-9 (6.81)	13.13***
Achievers	14-6 (58.0)	9-9 - 17-9 (36 - 76)	1-7 (5.79)	
Response Time per Item (Sec.):				
Learning Disabled	4.8	1.9 - 13.3	1.89	5.70*
Achievers	3.9	1.2 - 8.2	0.62	
Confrontation Naming:				
Errors:				
Learning Disabled	3.38	0 - 11	2.60	9.57**
Achievers	0.84	0 - 4	1.09	
Total Response Time (Sec.):				
Learning Disabled	53.34	32 - 85	12.06	4.13*
Achievers	43.78	27 - 69	7.49	
Controlled Association:				
Foods (No. in 60 sec.):				
Learning Disabled	18.66	8 - 28	4.46	5.70*
Achievers	23.16	14 - 30	4.60	

TABLE 2. Continued.

Test	Mean	Range	SD	χ^2
Animals (No. in 60 sec.):				
Learning Disabled	18.00	8 - 26	3.90	0.95
Achievers	18.75	13 - 28	3.43	
Toys (No. in 60 sec.):				
Learning Disabled	11.09	5 - 19	3.07	0.95
Achievers	13.03	5 - 23	4.44	
Sentence Production:				
Errors:				
Learning Disabled	0.59	0 - 3	0.76	-
Achievers	0	-	-	
Mean Word Length:				
Learning Disabled	4.80	3.1 - 6.2	0.99	4.13*
Achievers	6.05	4.4 - 10.8	1.49	
Mean Response Lag (Sec.):				
Learning Disabled	3.12	0.5 - 12.6	2.45	4.13*
Achievers	1.70	0.1 - 3.6	0.87	
Word Definition:				
Errors:				
Learning Disabled	5.31	2 - 8	1.52	20.32***
Achievers	2.02	0 - 5	1.01	

* p .05; ** p .01; *** p .001.