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AUTHOR Telser, Elsa B.; Rutherford, David R.
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ABSTRACT

The word finding skills of a group of 20 stuttering children (5 to 12 years of age) were compared with those of a control group of 20 normally speaking children matched for age and socioeconomic status. The Northwestern Word Latency Test was administered in which each child was shown 46 pictures of common objects. Any picture not named readily on the initial presentation was eliminated from subsequent administrations of the test for that child. Four additional administrations of the remaining pictures in the series were carried out. Fifty-five percent of the Ss were found to have easily demonstrable word finding problems. Older children in both the stuttering and nonstuttering groups named pictures faster than the younger, but the older stutterers were only as fast as the younger nonstutterers. Moreover, young and old stutterers without word finding difficulties did not differ in meaning response time from young nonstutterers. (GW)

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CLINICAL ASSESSMENT OF WORD-FINDING ABILITIES OF STUTTERING AND NONSTUTTERING CHILDREN

ELSA B. TELSER and DAVID R. RUTHERFORD
Northwestern University

The clinical psychologist is often asked to evaluate persons who exhibit stuttering symptoms. When confronted with an individual who exhibits this complicated disorder, they are often unable to fulfill the diagnostic task of adequately assessing the way in which various factors interact to create or intensify the symptom. The present study introduces a test which helps to identify those youngsters among the population of stutterers (and among the population of nonstutterers) who exhibit symptoms of a subtle form of language disorder. These symptoms are manifested in word-retrieval problems.

In recent years, routine testing of stuttering children entering the Northwestern University Speech Clinic has revealed word-finding problems in a very substantial percentage of cases. Prior to this time, only one attempt has been made to study this language skill in stutterers. In 1961, a study reported that 25% of a group of 168 stuttering children demonstrated word-finding difficulties compared with only 3% of a control group of 173 nonstuttering children. The method for determining the presence of a word-finding problem involved comparing the number of object names that a child could *write down* in a given time period, with the number of objects he could *name orally* in the same time span. If he could write more object names than he could speak, a word-finding deficit was presumed. That methodology must be questioned, however, since both the written and oral tasks require symbol retrieval, which we regard as synonymous with "word finding." The task might more appropriately be thought of as a measure of "word writing" versus "word speaking," possibly of value in studying verbal apraxia but not *word finding*, since the recall task seems to be the same in both kinds of verbal behavior.

The present study of word-finding skills in stuttering and nonstuttering children employed the Northwestern Word Latency Test, a picture-naming task previously described in a paper presented to the American Speech and Hearing Association in November 1970. On that test, *S* is first asked to name a series of 46 pictures of common objects (bed, spoon, table, etc.). If he fails to name a given picture or exhibits undue response latency in naming it, the item is eliminated from the test. Using only those pictures that have previously been named rapidly and easily, the series is then administered a second time. When the Word Latency Test is used clinically as a screening measure for word-finding problems, *S* is considered to have normal word-finding skills if he exhibits no more than two response latencies of 3 sec. or greater on the second administration of the picture series. This procedure is based on average response latencies for normally speaking children in the age range of 5½ to 7½ yr. Individuals who exhibit more than two 3-sec. latencies are asked to name the picture series a third, fourth, and fifth time. Those whose word-finding skills are intact will continue to name the pictures rapidly and easily, even on the fifth administration. Persons with word-finding problems find the task increasingly difficult, showing increasing numbers of word lapses, i.e., inability to name a previously named picture. These lapses may range in duration from seconds to a minute or more. When such responses are observed, the individual is questioned about the reason for the delay, and he is designated as having a word-finding problem only when he repeatedly indicates that he recognizes the object, knows its function, but momentarily cannot remember its name. Common explanations are these, "I forgot the name," "I couldn't remember the name for a minute," "I couldn't think of the right word," and even from one 5-yr.-old, "My eyes can't think that fast."

METHOD

In the present study, the word-finding skills of a group of 20 stuttering children ranging in age from 5 to 12 yr. of age were compared with those of a control group of 20 normally speaking children, individually matched for age and socioeconomic status. The two groups were equivalent in verbal intelligence as measured by the Peabody Picture Vocabulary Test, Form B. Quotients for the stuttering group ranged from 95 to 143, and from 91 to 141 for the nonstuttering group. Mean quotients for the stutterers and nonstutterers were 116 and 115, respectively.

As mentioned previously, each child was shown 46 pictures of common objects, one at a time, and any picture not readily named on the initial presentation was eliminated from subsequent administrations of the test for that child. Four additional administrations of the remaining pictures in the series were then carried out. Tape recordings of these responses were made, and the time lapse between the exposure of each picture and the *S*'s spoken response was measured on the write out of a graphic level recorder in units of 1/10 of a sec.

The Word Latency test has been used as a screening measure for word-finding problems since 1960, and whenever its administration to stuttering children is described, the first question asked is "How do you know that the child's delayed response is a word lapse and not a stuttering block?" Stuttering blocks do occasionally occur (surprisingly infrequently, however) and when they do, they can be readily identified by the child's repetition of the initial sound or syllable of the word, showing that the word is in mind or, if the block is a silent one, by his making the initial articulatory contact but uttering no sound. Also, children 5 yr. and older can readily distinguish between a true motor block, i.e., having the word in mind yet being unable to utter it, and a word lapse, forgetting the name of the pictured object. Nevertheless, as a means of assuring that the longer response latencies anticipated in the stuttering group would indeed be indicative of longer word-retrieval time and not slower oral motor response time, those children who were able to read were also shown flash cards on which the names of the pictures were printed. These cards were presented one at a time for a total of five trials, and response latencies for the printed words were measured in exactly the same way as response latencies for the pictured objects.

RESULTS

The average picture-naming responses of the stuttering children were significantly slower than those of the nonstutterers Table 1 of the handout[1] shows that the mean response time for stutterers was slightly over 1 sec., while the nonstutterers had a mean response time of slightly less than 1 sec. The question of whether this represents a difference in oral motor response time is answered in Table 2 of the handout, where the difference in mean response time for word reading for the two groups was only 60 msec., decidedly of no statistical significance. The nature of the differences in picture naming by the two groups can be seen more clearly from the distributions of responses over time and trials shown in Tables 3 and 4 of the handout than from the means in Table 1 of the handout. Interestingly, the response latencies of both groups of *S*s slowed or increased in duration between the first and fourth trials of the picture-naming task, while Table 5 of the handout shows that both groups decreased in mean response time between the first and fourth trials of the word-reading task. This would seem to lend support to the notion that it is symbol-retrieval skill rather than oral motor response time that distinguishes the two groups.

The foregoing data demonstrate differences in certain average performances of groups of stutterers and nonstutterers; to generalize from such group data is abjectly erroneous. Table 6 of the handout shows that 11 of the 20 stuttering children and 3 of the nonstuttering children were classified as having word-finding problems according to the criteria described earlier. When one compares the picture-naming responses of the 9 stutterers without word-finding problems with those of the 17 nonstuttering children without word-finding problems (shown in Table 7 of the handout), the similarities between the two groups are remarkable, but no less so than the similarities between the 11 stutterers with word-finding problems and the 3 nonstutterers with word-finding problems shown in Table 8 of the handout.

There are many other interesting differences between these two groups of children, e.g., those shown in Table 9 of the handout: Older children in both the stuttering and nonstuttering groups named pictures faster than the younger children, but the older stutterers were only as fast as the younger nonstutterers. Again, to avoid the error of generalizing about "all stutterers" vs. "all nonstutterers," Tables 10 and 11 of the handout show that young stutterers without word-finding difficulties do not differ in mean response time from young nonstutterers, and that the same is true for the older stutterers without word-finding difficulty.

[1]Tables 1 through 10, discussed in this investigation, are not included because of space limitations; they will be handed out at the time this paper is presented, and they are available upon request.

DISCUSSION

Most of what is important in the foregoing can be put in one statement. The Northwestern Word Latency Test clearly separates an unselected group of 20 young stutterers into two subgroups, one with normal word-retrieval skills and a second with easily demonstrable word-finding problems. In this particular study, 55% fell in the latter group. Our experience in screening young stutterers in the clinic tends to indicate that the long-term figure is closer to 35%.

The link between deficient word-retrieval skills and the onset of stuttering must still be explored. It seems reasonable to postulate that inconsistent or unreliable word-finding abilities may create apprehension about speech and, with the help of negative parental attitudes, may lead to the learning of approach-avoidance reactions that develop into stuttering. On the other hand, under conditions of verbal stress, a word-finding problem may simply intensify stuttering symptoms that the youngster already manifests. The first hypothesis seems more tenable, and is the basis on which we are proceeding with differential therapy programs incorporating specific remedial language techniques for those stuttering children who are found to have word-finding problems.

Treatment for the child with a word-retrieval problem involves parent counseling and child counseling as well as the management of the fluency problem and the language problem. Parents need to be informed about the relationship of the language problem and its role in creating speech-centered anxiety. They need to see how environmental factors act to create the learned reactions to language problems that are identified as the stuttering symptoms. Finally, they should be guided in ways to help reduce the frustration their child experiences in communication with techniques such as supplying a known word, asking association-producing questions, and accepting functional descriptions for words the child does not readily retrieve.

The child should be given some understanding of his language problem, and some insight into how delays in word recall are reacted to by people in the environment. Stress intensifies the problem, and it is important that the youngster develop self-confidence and a positive self-image to help reduce tension and anxiety. He should be taught ways of coping with his retrieval problem, such as developing his vocabulary, building verbal associations, and practicing rapid naming. While these techniques do not improve retrieval time, they do allow the individual to increase his level of confidence by developing his verbal resources and by learning to relax in stressful situations.

Additional techniques are being developed with the aim of minimizing the penalty of the language disorder while promoting healthy self-concepts and fluent speech. Thus far our experience has shown that the prognosis for children whose stuttering has a language substrate is more positive than the prognosis for youngsters whose nonfluency falls in the "unknown etiology" category.

CLINICAL ASSESSMENT

WORD-FINDING ABILITIES OF STUTTERING AND NON-STUTTERING CHILDREN

Elsa B. Telser, Ph.D.
David Rutherford, Ph.D.

Northwestern University
Evanston, Illinois 60201

American Psychological Association
Honolulu, Hawaii
September 1972

TABLE I

MEAN RESPONSE LATENCIES FOR STUTTERERS AND NON-STUTTERERS ON FOUR TRIALS OF THE NORTHWESTERN WORD LATENCY TEST

	Mean	S.D.	P
Stutterers (N = 20)	1.19 seconds	.41	
Non-stutterers (N = 20)	.96 seconds	.19	< .05

TABLE II

MEAN RESPONSE LATENCIES FOR STUTTERERS AND NON-STUTTERERS ON FIRST AND FOURTH TRIALS OF A WORD-READING TASK

	Mean	S.D.	P
Stutterers (N = 20)	.68	.09	NS
Non-stutterers (N = 20)	.62	.11	

TABLE III

PERCENTAGE OF RESPONSES BY STUTTERERS OCCURRING IN FOUR TIME INTERVAL CATEGORIES ON REPEATED TRIALS OF THE NORTHWESTERN WORD LATENCY TEST

	0.0-0.99 sec.	1.0-1.99 sec.	2.0-2.99 sec.	3.0+ sec.
Trial 1	50.2%	43.1%	3.9%	2.8%
Trial 2	43.2%	47.0%	5.9%	3.9%
Trial 3	45.9%	45.9%	5.2%	3.0%
Trial 4	42.7%	47.3%	6.0%	4.0%

TABLE IV

PERCENTAGE OF RESPONSES BY NON-STUTTERERS OCCURRING IN FOUR TIME INTERVAL CATEGORIES ON REPEATED TRIALS OF THE NORTHWESTERN WORD LATENCY TEST

	0.0-0.99 sec.	1.0-1.99 sec.	2.0-2.99 sec.	3.0+ sec.
Trial 1	61.4%	37.4%	1.0%	0.2%
Trial 2	59.3%	38.3%	1.9%	1.1%
Trial 3	61.9%	36.4%	1.1%	0.6%
Trial 4	56.6%	40.1%	1.9%	1.4%

TABLE V

MEAN RESPONSE LATENCIES ON TRIALS ONE AND FOUR OF A WORD-READING TASK FOR STUTTERERS AND NON-STUTTERERS

	Trial 1		Trial 4		
	Mean	S.D.	Mean	S.D.	P
Stutterers (N = 20)	.70	.09	.67	.09	$< .05$
Non-stutterers (N = 20)	.65	.10	.59	.12	$< .05$

TABLE VI

NUMBER OF STUTTERING AND NON-STUTTERING SUBJECTS CLASSIFIED AS HAVING WORD-FINDING PROBLEMS ON THE NORTHWESTERN WORD LATENCY TEST

	Word-Finding Problem	Normal Word-Finding Abilities	X^2	P
Stutterers	11	9	7.04	$< .01$
Non-stutterers	3	17		

TABLE VII

PERCENTAGE OF RESPONSES ON THE NORTHWESTERN WORD LATENCY TEST GROUPED IN FOUR TIME INTERVAL CATEGORIES FOR STUTTERERS AND NON-STUTTERERS WITH NORMAL WORD RETRIEVAL ABILITY

	Stutterers (N = 9)	Non-stutterers (N = 17)
0.0 - 0.99 seconds	58.0%	59.4%
1.0 - 1.99 seconds	38.7%	37.8%
2.0 - 2.99 seconds	1.3%	2.2%
3.0+ seconds	2.0%	0.6%

TABLE VIII

PERCENTAGE OF RESPONSES ON THE NORTHWESTERN WORD LATENCY TEST GROUPED IN FOUR TIME INTERVAL CATEGORIES FOR STUTTERERS AND NON-STUTTERERS WITH WORD RETRIEVAL DIFFICULTIES

	Stutterers (N = 11)	Non-stutterers (N = 3)
0.0 - 0.99 seconds	35.9%	33.2%
1.0 - 1.99 seconds	50.7%	56.9%
2.0 - 2.99 seconds	7.9%	6.0%
3.0+ seconds	5.5%	3.9%

TABLE IX

MEAN RESPONSE TIMES FOR YOUNGER AND OLDER STUTTERING AND NON-STUTTERING CHILDREN ON FOUR TRIALS OF THE NORTHWESTERN WORD LATENCY TEST

		Mean	S.D.	P
Younger Stutterers	(N=11)	1.35 seconds	.52 seconds	
Younger Non-stutterers	(N=11)	1.04 seconds	.22 seconds*	
Older Stutterers	(N=11)	1.04 seconds	.19 seconds	
Older Non-stutterers	(N=11)	.87 seconds	.12 seconds	

*Difference between means of younger and older non-stutterers significant at .05 level of confidence.

TABLE X

COMPARISON OF MEAN RESPONSE TIME ON FOUR TRIALS OF THE NORTHWESTERN WORD LATENCY TEST FOR YOUNG STUTTERERS WITH NORMAL WORD RETRIEVAL ABILITY AND YOUNG NON-STUTTERERS

	Mean	S.D.	t	p
Stutterers (N = 4)	.99	.05	.11	> .05
Non-stutterers (N = 10)	1.04	.22		

TABLE XI

COMPARISON OF MEAN RESPONSE TIME ON FOUR TRIALS OF THE NORTHWESTERN WORD LATENCY TEST FOR OLDER STUTTERERS WITH NORMAL WORD RETRIEVAL ABILITY AND OLDER NON-STUTTERERS

	Mean	S.D.	t	p
Stutterers (N = 5)	.89	.02	.13	> .05
Non-stutterers (N = 10)	.87	.12		