Perceptual and Motor Skills, 1984, 58, 221-222.

SEGMENTATION ABILITIES OF DYSLEXICS AND NORMAL READERS

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Summary.—Dyslexics (15 boys, 12 girls, 6 to 9 yr.) were not poorer than normal readers (13 boys, 11 girls, 6 to 9 yr.) in segmenting tone sequences but much poorer in segmenting speech.

While several authors have pointed out that dyslexics are unable to segment speech explicitly into phonetic units (e.g., Savin, 1972), no comparison has been provided of the segmentation of speech and non-speech sounds, and in the first case of syllabic and phonetic segmentation, by dyslexics and normal readers.

Three speech and one non-speech segmentation tasks were used. In the speech tasks, the subjects had to delete the first phone from an utterance provided by the examiner. On each of these tasks, there were 15 introductory trials to illustrate the rule and 20 experimental trials. In the introductory trials utterances were non-words which became words by the deletion of the first phone. A correction procedure was used, i.e., when the subject did not produce the correct response the examiner provided it. On the experimental trials utterances were non-words and the correct answer was a non-word, the subject having been told previously that he would work with "meaningless words". At this stage, no correction was provided. On one of the tasks the first phone ([a]) was a syllable. Only 11 experimental trials will be considered here because in the others the correct response would be illegal in French. The other two tasks were of phonetic segmentation, one using [p] and the other [f]. The second phone in the utterance was either a vowel for 10 experimental trials, or [r] or [l] for the remaining 10 trials. Each subject was first tested with [a]. Then, half of the subjects were tested in the order [p]—[f], and the other half in the reverse order. As the two consonants gave similar results, only the averages are presented. In the non-speech task, the subject had to reproduce the last three notes from a sequence of four produced by the examiner in a xylophone. Only the low and high-pitched C were used. The remaining notes of the scale were covered. The test consisted of five introductory trials followed by nine experimental trials.

Three groups of subjects were tested in the fourth month of the school year. The subjects of the dyslexic group, 15 boys and 12 girls aged from 6 yr. 1 mo. to 9 yr. 6 mo. (mean: 8;0) attended classes at the more elementary level in a school specially for dyslexia and had all been diagnosed dyslexic by an official center. All had normal WISC IQs. They were taught to read according to a phonic method. The remaining subjects came from a normal school, in which the same method was used, and formed two groups. One consisted of first-graders (7 boys and 5 girls) aged from 6;2 to 6;10 (mean 6;7), the other of second-graders (6 boys and 6 girls) aged from 7;3 to 9;1 (mean 7;8). All subjects were given a reading test which required reading aloud a list of 32 mono- and disyllabic regular words in 1 min. The mean scores of the dyslexics, first- and second-graders were 3.4, 19.3 and 28.8 words, respectively.

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TABLE 1

MEAN PERCENT CORRECT RESPONSES, AND *SD*s, FOR EACH GROUP AND TASK

Groups	Segmentation							
	Syllabic		Phonetic [p] or [f] followed by				Non-speech	
			vowel		[r] or [l]			
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Dyslexic	68.3	28.33	13.7	20.46	12.1	19.76	28.8	22.42
Grade 1	94.7	7.08	71.3	35.23	25.7	29.03	16.6	11.55
Grade 2	94.7	6.08	94.6	5.82	55.4	31.80	39.1	21.51

In non-speech segmentation, dyslexics were slightly but non-significantly worse than second-graders ($t = 1.3$, $df = 37$) and better than first-graders ($t = 1.7$, $df = 37$, $p < .05$). On the contrary, they were considerably worse than normal readers in speech segmentation, especially the phonetic one which they completely failed. It is worth noting that the performance of normal readers in deleting the first phone depended heavily on whether they had to cut in a consonantic cluster; see Table 1. Analysis of types of error in phonetic segmentation shows that item repetitions were much more frequent for dyslexics (44.9% and 61% of the errors, before a vowel and a liquid, respectively) than for first- (34.3% and 16.8%) or second-graders (0% and 3.7%). Adversely, deletion of the initial CV syllable was less frequent in dyslexics (13.6%) than in first- (37.1%) or second-graders (66.7%). Omissions and misplacements of the liquid as the only fault were also less frequent in dyslexics (9.2% and 4.4%, respectively) than in first- (48.6% and 25.3%) or second-graders (59.3% and 31.5%). While errors of normal readers tend to be minimally deviant, errors of dyslexics indicate a trouble with phonetic segmentation more global and severe than their performance in the syllabic task would suggest. Finally, we have looked at the Bravais-Pearson correlations between reading and segmentation scores whenever a ceiling or a floor effect could not be suspected, that is, for first-graders only. The correlation between reading and non-speech scores (−.11) contrasted with the correlations between reading and phonetic scores (.67 and .47, in the case of [p] or [f] followed by a vowel and [r] or [l], respectively). While non-speech segmentation does apparently not bear any relationship with reading, phonetic segmentation clearly does.

The main conclusion of the present work is that dyslexics are impaired in speech compared to non-speech segmentation for which they seem near the norm, and that that impairment is especially pronounced at the phonetic level.

REFERENCE

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Accepted January 2, 1984.