

A Study of Co-articulation in Stuttering*

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In spite of the theoretical simplicity and appeal of the notion that stuttering reflects a lack of co-articulation, it has received little recent empirical support. The purpose of the present study was to analyze the extent of first and second formant transitions in the fluent and disfluent speech of stutterers and to compare this with the fluent utterances of normal speakers. The technique of analyzing the acoustic wave was employed to test the problem selected. A list of 54 VCV nonsense disyllables consisting of short vowels [a, i, u] and stop consonants [p, t, k, b, d, g] was constructed. The subjects, 2 stutterers and 2 normal speakers, orally read this material in a random order, from the recordings of which both wide-band and narrow band spectrograms were made. Altogether 432 spectrograms were prepared and analysed.

No effort was made to put the data to any statistical test but on the other hand the data were descriptively analysed. As the stutterers did not emit even a single stuttering block on any of the VCV sequences, comparison between the fluent and disfluent utterances in regard to formant transitions could not be made in the present study. However, a comparison between fluent utterances

of stutterers and normal speakers was made. Results indicated that, though the rising and falling trend of the formant frequency transition was the same in fluent speech of stutterers as it is in the normal speakers (contrary to the findings of Agnello, 1966), the extent of such transitions was different in the two groups of subjects.

In general, the data obtained in the present study indicated the following trends :

- (1) The fluent utterances of stutterers were not the same as fluent utterances of normal speakers.
- (2) Even the fluent utterances of stutterers manifested a number of co-articulatory transitional differences when compared to the utterances of normals.
- (3) The co-articulatory 'differences' found in the fluent utterances of stutterers indicated that the articulatory configurations required for the production of a phoneme in question were not fully achieved.

These observations, in general, lend credence to the notion that the fluent speech of stutterers is not the same as the fluent speech of normal speakers and is also consistent with the large body of literature on linguistic factors in stuttering.

* Master's Dissertation, University of Mysore, 1985.

Two other observations were made from the spectrograms which were not very consistent.

- (1) The second formant was missing in a number of VCV sequences in the fluent speech of stutterers. Such a feature was not observed in the speech of normals.
- (2) The second formant of vowel [a] was both rising and falling at the

same instance of transition in some utterances of a normal speaker. The significance of this is not known at present, but this is a unique feature that has not been observed or reported in the past.

All the observations mentioned above, except the last one, warrant vigorous experimentation on the co-articulatory aspects of stuttering in the future.