

Stuttering and Coarticulation

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Stuttering is a fluency disorder characterized by frequent interruptions in the smooth fluent flow of speech: monosyllabic-word repetitions, part-word repetitions, silent and audible sound prolongations (see ‘Stuttering-Like Disfluencies’, Yairi & Ambrose, 2005) are the hallmark characteristics of stuttering.

According to van Lieshout et al. (2004), stuttering may arise from an innate limitation in the speech motor control system, which fails to prepare and organize the movements required for speech. In this view, dysfluencies reflect errors in the motor control and they ultimately represent breakdowns in the precisely timed and coordinated articulatory movements required for fluent speech.

In the past 40 years, a number of studies on movement control have shown significant group differences between people who stutter and normally fluent speakers as control group. Accordingly, there has been considerable experimental effort devoted toward understanding speech motor control characteristics of stuttering speakers, and coarticulation was one of the most studied aspect of speech production.

Coarticulation, the spatio-temporal overlap of speech gestures, is a crucial aspect in the realization of fluent speech and abnormal articulatory patterns have been found in the fluent and dysfluent speech of children and adults who stutter, compared to the control group (Robb & Blomgren, 1997; Chang et al., 2002).

Studying coarticulation in the speech of children who stutter could be particularly relevant because, compared to adults, their speech is free from the influence of treatment as well as any learned or habitualized speech production reactions to or associated with longer-term history of stuttering. Hence, the evaluation of children’s motor abilities allows to identify the real manifestations of the disorder instead of compensatory articulatory strategies.

Furthermore, Subramanian et al. (2003) have demonstrated that coarticulatory patterns in the fluent speech of preschool age children may be a good marker to predict the risk of persistent stuttering.

The topic of this talk is, therefore, devoted to sum up some of the most interesting findings emerged from the study of coarticulation in the stuttering speech, and to discuss some acoustic and articulatory results obtained for Italian stuttering children.

Acoustic analysis of anticipatory coarticulation has been realized on the fluent speech of 13 pre-school age stuttering children and 26 normally fluent peers. The purpose of the study was to evaluate the prognostic value of second formant transitions as an early predictor of chronic stuttering.

Locus Equations was the metric used to compare the degree of anticipatory coarticulation among the two groups. This metric, commonly used in acoustics (Sussman et al. 1999), has been transposed also in the articulatory domain: tongue imaging data were collected to analyze lingual coarticulation in the speech of

4 school-age children who stutters and a matched control group. The aim of the articulatory study was to have a direct inspection of lingual dynamics into the vocal tract, and to identify possible abnormal articulatory patterns in the speech of the stuttering group.

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