Development of Production of Coarticulation in Children

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Coarticulation may be defined as a speech production process in which the coarticulatory characteristics, features or properties of one sound are modified by another sound. Evidences for the presence, different types & extent of coarticulation have come from physiological, acoustical and perceptual study. The extent or magnitude of coarticulation is highlighted by the physiological and acoustical studies.

The present study was aimed to shed some light onto this- aspect of coarticulation and also to trace its development. Six Kannada speaking normal children, one each in the age range of 4 to 4.6, 4.6 to 5, 5 to 5.6, 5.6 to 6, 6 to 6.6 & 6.6 to 7 years participated in the study. The material chosen for the study were divided into two sets of stimuli. In the first set, the final syllable remained constant (ta) which was preceded by varying CV combinations where c = /p/, *Ik/, /t/* & v = /a/, /i/, /u/ in the second set, the initial syllable remained constant (pa) followed by CV combinations where C was /p/. *I* / & *Ik/* & v = /a/, *Iil, lul.* There were nine words in the first set & eight words in the second set. These 17 words were randomized to make five sets and thus a total of 85 words formed the child's sample.

The children were tested individually. The repetitions of the children were recorded onto a spool at a high speed (7 1/2'/min) by using the internal tape recorder of the sound specographe VII 700. Bar type expanded (upto $KHz) wide band spectograms were obtained for all the words. A total of 510 spectograms were obtained and were analyzed for the following four parameters.

1. Transition duration of F2 : It is the time duration between the onset of the second formant for the vowel to the steady state of the same.
2. Terminal frequency of F2 : It is the frequency of the F2 at the onset of the vowel following the stops.
3. Extent of transition (Hz): It is the frequency difference between the terminal frequency of F2 & the frequency at the onset of the steady state vowel.
4. Speed of transition (HZ/M. SEC): Speed of transition of F2 is the rate at which the F2 moves. It is the ratio between the extent of transition and transition duration.

The data was tabulated and averaged across subjects for each consonant and vowel in the initial and medial positions. The data was subjected to repeated measures of ANOVA with Fisher's LSD.

The results indicated no specific developmental pattern for any of the parameter and the results were highly variable. However, when the measurements obtained at the age of 7 years were compared with that of 4.6 years, it was noticed that the T.D., S.T and extent of transition were longer and the terminal frequency of F2 was reduced in the older age group. These finding may be because of the acquisition of fine motor control in articulating plosives, and changes acquired in the oral cavity, articulators due to physiological maturation.

Further research in coarticulation may be carried out to study the coarticulatroy effects in children & their developmental patterns in depth. This will enable the speech & language pahtologists to understand the effects of coarticulation on defective sounds as well as to use coarticulatory principles in remediation of the same.