

Spring-like effect near a child's phonological acquisition of target segments

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Abstract

A child's production of target segments near the time of complete acquisition, i.e. adult-like speech, is examined in a longitudinal case study. In order to understand the phonological processes near complete acquisition, the production of target segments during the entire span of development is considered. To this end, the child's daily imitative and spontaneous speech productions in English from one-word stage to age 4;2 were recorded, IPA phonetically transcribed and entered in a CLAN (MacWhinney, 2000) database. The child's substitutions for consonantal targets are tracked throughout the study. It is found that near the time of a segment's complete phonological acquisition, there are occurrences where the target segment is realized by a new substitution, which itself appeared as target shortly before. Representative examples include segment [r] substituting target segment /l/ and segment [g] substituting target segment /k/. In addition, there are consonantal segments which near acquisition are substituted by a pseudo-new (long-forgotten) segment, that is, a segment not used as the target's substitution since the beginning of the target's development. For example near acquisition, target segment /ð/ is substituted by segment [d]. These pseudo-new substitutions may be associated with the grandfather effect discussed earlier in the literature in other contexts of phonological development (Barlow, 2007). It is noted that the new or pseudo-new substitutions and their corresponding targets share at least a common place of articulation, which is not necessarily the case for this or other children's (Ingram, 1989) phonological development during previous stages. It is widely accepted that phonological development has a cognitive-linguistic component associated with perception and memory and a biological component associated with speech-motor skills (Stoel-Gammon, 2011). It is proposed here that the phenomenon reported in the present study may be explained by the spring-like effect of a bio-cognitive model. The model consists of a neural-network spring which is strained substantially when loaded by perception, memory and articulation skill during phonological development, thus, causing the child to substitute target segments in her speech. Near complete acquisition, the spring approaches its equilibrium position as strain diminishes due to an increase in the spring rigidity caused by maturity. The built-up momentum, however, causes the spring to go beyond its equilibrium position, during which the target segment is realized as a new or a pseudo-new substitution.

References

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