

Phonological versus Motor Planning Deficits in Children with Severe Speech Sound Disorders

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This poster presentation will describe 12 children who simultaneously met criteria for the diagnosis of “inconsistent deviant phonological disorder” by virtue of high inconsistency scores on the Diagnostic Evaluation of Articulation and Phonology Word Inconsistency Test (Dodd et al., 2005) and for the diagnosis of Childhood Apraxia of Speech given slow and/or inaccurate trisyllable repetition (Thoonen et al. 1999). We will show that the children form two subgroups with (1) qualitatively different performance on the Syllable Repetition Task (Shriberg et al. 2009; Shriberg et al. 2012); (2) qualitatively different speech error patterns; and (3) different response to intervention. Test scores describing these subgroups in the oral motor, speech, language and phonological processing domains have been presented elsewhere (Rvachew & Mathews, accepted). The subgroup with a phonological planning deficit comprises 5 children with mean age 58 months, mean Peabody Picture Vocabulary Test SS = 82, mean Kaufman Brief Intelligence Nonverbal IQ = 98 and mean Percent Consonants Correct (single words) = 62. The subgroup with a motor planning deficit comprises 7 children with mean age 73 months, mean Peabody Picture Vocabulary Test SS = 90, mean Kaufman Brief Intelligence Nonverbal IQ = 74 and mean Percent Consonants Correct (single words) = 48. These two subgroups are particularly differentiated by their performance on the Syllable Repetition Test: although all children show very low overall competency scores, the subgroup with phonological planning deficits achieves low memory scores with relatively high transcoding scores whereas the subgroup with motor planning deficits achieves low scores in transcoding but relatively high scores in memory. Specifically, the subgroup with phonological planning deficits obtained a mean competency score of $z = -2.91$ and raw scores of 63 and 90 for memory and transcoding respectively. The subgroup with motor planning deficits obtained a mean competency score of $z = -4.74$ and raw scores of 84 and 67 for memory and transcoding respectively. Low transcoding scores are obtained when the children produce addition errors during nonsense syllable repetition and are an indicator of speech apraxia. We have also previously described their response to treatment. Using a single subject randomized alternation design each child was exposed to three interventions, in each case to treat a unique treatment target. Children with phonological planning deficits responded best to an intervention that provides visual cues to phonemes and phoneme order. Children with motor planning deficits responded best to an intervention targeting auditory motor integration. This poster will focus on the speech error patterns that differentiate these two subgroups however, using phonetic and acoustic analyses. In particular, the subgroup with motor planning difficulties presented with acoustic evidence of syllable segregation deficits manifested in the duration of gaps between syllables and other temporal parameters of their speech.

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