Introduction

Moving Across Syllables: Training Articulatory Sound Sequences is designed for use with children ages 3 to 10 who have difficulty executing *sequenced movements* in words. Sequenced movements are the changes in articulatory placement as the speaker moves from the initial phoneme of a word to the initial phoneme of the next syllable or, in the case of one-syllable words, from the initial phoneme to the final phoneme. These transitive movements are crucial to intelligibility and accuracy in conversational speech.

Moving Across Syllables is a therapy tool to help train sequencing skills within and across syllables, using one-, two-, and three-syllable words arranged according to traditional place of articulation. A test and retesting procedure is used to identify problems and to document improvement in a child's sequencing skills.

The results of the initial test will help identify specific sequencing problems and will describe both the syllable number and movement sequence at which errors occur. The program then allows you to target those errors for remediation using treatment goals that emphasize movement sequence targets and syllable number targets. *Moving Across Syllables* contains picture stimuli, cuing and prompting techniques, treatment suggestions and activities, branching strategies, and generalization activities.

Origins of the Program

Moving Across Syllables developed as an outgrowth of clinical experience with young children with developmental apraxia. The diagnosis, treatment, and even existence of developmental verbal apraxia is controversial. The condition is defined by Blakely (1980) as "non-linguistic disorders of articulation characterized by impaired *capacity* to program the positioning of speech musculature and the muscle movements for the volitional production of phonemes" (p. 1).

Aram (1984) argues for viewing developmental verbal apraxia as a distinct syndrome and defines it as "a severe and persistent phonological disorder coupled with an expressive syntactic disorder with variable neurological and articulatory findings" [p. vi].

According to Crary (1984), developmental verbal apraxia is "a motor-linguistic disorder of the developing phonological system with the underlying etiology being deficits in spatial-temporal control of the speech mechanism." He goes on to say that

> clinicians should utilize a phonological assessment approach that permits the classification of error patterns and facilitates their hierarchial ranking in terms of strength. A sound-by-sound approach to assessment and intervention is not practical nor beneficial in these cases. This implication is supported by the observation that syllable structure control is a severe deficit in these children. As such, syllable structure control should be viewed as a main focus of phonological intervention (p. 80).

Research indicates that the phonological errors of children with developmental apraxia are particularly resistant to traditional articulation therapy and that the most effective treatments incorporate visual, tactile, and kinesthetic stimulation as well as auditory stimulation. Blakely (1983) recommends using simple whole words or syllables as treatment stimuli, moving quickly to phrases and sentences, while making strong attempts to obtain the correct number of syllables per word. He suggests using contrasting tone shifts and gestures to reinforce the movement component of speech when connecting syllables.

Because developmental verbal apraxia may be considered a "speech programming" disorder, recent treatment approaches have used principles of speech sound sequencing rather than traditional speech sound teaching. Two of the more recent multisensory approaches are the *Prompt System* by Chumpelik (1984) and the *Touch-Cue Method* by Bashir, et al. (1984). The *Prompt System* stresses phonetic targets and the neurological/sensory feedback necessary to reduce phonetic errors and to establish "normal" speech-motor production. The *Touch-Cue Method* is a speech sound sequencing program based on the assumption that the child has difficulty integrating voluntary oral motor movements. We have found Blakeley's suggestions as well as the *Touch-Cue* prompts to be quite effective in helping apraxic children develop their sequencing skills. The cuing and prompting strategies used in *Moving Across Syllables* rely heavily upon the work of Chumpelik and Bashir, et al.

Purpose and Objectives

Moving Across Syllables provides a systematic, organized approach to sequencing problems. The program is not intended to teach specific phonemes but rather to emphasize movement sequences across single and multisyllabic word/phrase contexts. The objective is not for the child to learn the accompanying training stimuli but to develop improved sound/syllable patterning skills for words and phrases in general.

The first step to setting treatment goals is to administer the test and analyze the data. Then use the program materials for intensive structured drill on selected movement sequences. Through the use of cuing and prompting strategies, you can enhance a child's performance at any given level of difficulty throughout the program. These cues and prompts are systematically removed as the child masters the sequence skill. Generalization activities are suggested should you wish to use the program beyond the word/phrase level to help your clients develop functional use of their improved sequencing skills.

Children with developmental verbal apraxia often have syntactic and linguistic deficits. This program is not intended to replace language therapy programs but should be used in conjunction with them as necessary.

Moving Across Syllables accomplishes several objectives in treatment of children with sequencing difficulties:

- It provides a means of identifying and describing movement sequencing difficulties during production of single and multisyllabic words or phrases.

- It permits analysis of a child's oral sequencing problems with regard to syllable number and movement sequences.

- It serves to clarify a child's need for auditory-visual-tactile cuing and enables you to determine what conditions are necessary for the child to successfully produce specific sound sequences in multisyllabic words/phrases.

- It enables you to document improvement in a child's sequencing skills across syllable number and movement sequence targets.

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Components

Moving Across Syllables consists of a test booklet and a manual. Included in the manual are reproducible training materials, pictures, and test and recordkeeping forms.

The test booklet has three pictures per page. Each picture represents a single movement sequence; the three pictures represent the three syllable levels.

The reproducible test forms give all information necessary for scoring, recording, and analyzing test results.

The training materials are picture sheets arranged according to number of syllables and movement sequence. Meaningful single and multisyllabic words and phrases are used as training stimuli since their use is well supported by the literature and is a pragmatically sound concept.

Training words represent a variety of semantic concepts, such as verbs, attributes, adverbs, and nouns. Whenever possible, the words are appealing, easily pictured, easily elicited, and familiar to young children. Linguistic distribution of the training stimuli is as follows:

Nouns = 72 percent
Verbs = 16 percent
Adverbs/prepositions = 3 percent
Adjectives = 9 percent

Target Population

Moving Across Syllables is designed for children ages 3 to 10. The program was conceived as a system to help children with apraxia develop sequencing skills. It can also be used as drill material for children who are dysarthric or exhibit severe phonological disorders. The pictures alone can be used as stimulus items for traditional articulation therapy.

Appropriate candidates for *Moving Across Syllables* are children who have developed some functional language skills but who demonstrate a phonological deficit characterized by errors when patterning sequences of sounds or syllables. The child with limited expressive language needs first to acquire a basic verbal vocabulary in order to function in communicative situations. Once that basic language is developed, the child can be considered for *Moving Across Syllables* if developmentally inappropriate sound/syllable errors are demonstrated.

The child who shows increased misarticulations as syllable length increases would be an ideal candidate for the program. Other error patterns include syllable reduction in polysyllabic words (/bʌflai/ for butterfly) or consistent phoneme substitution or omission errors in a specific co-articulation context—a *movement sequence*—such as *bilabial-velar* (pig, bucket) or *alveolar-bilabial* (top, tomato). The child who tends to omit final phonemes or "slurs" multisyllabic words is also an appropriate candidate.

Children should have a mean length of utterance of 3.5 words, be able to repeat, and have an attention span of 7 to 10 minutes. The materials in *Moving Across Syllables* have been used with children as young as 30 months, with modifications to allow for reduced vocabulary and attention span.