

RESOLVING UNINTELLIGIBILITY BY TARGETING SPEECH WITHIN LANGUAGE: A CASE STUDY

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BACKGROUND

- Co-morbidity of language delay and speech delay of unknown origin ranges from 9% to 77% (Shriberg et al., 1999)
- Speech delays have been effectively addressed by targeting speech sounds (Gierut, 1998)
- Speech delays have also been effectively addressed by targeting language
 - Matheny and Panagos (1978) reported gains in grammar and phonology by targeting syntax using a highly-structured imitation-based treatment approach
 - Hoffman, Norris, and Monjure (1990) reported gains in grammar and phonology by targeting propositional information within narratives
 - Better-controlled studies, however, suggest that targeting language may improve speech sound production in only some children
 - Fey et al. (1994) reported gains in grammar and phonology in only two of 18 children by targeting grammar
 - Tyler (2002) reported morphosyntactic treatment may facilitate phonological development in children who have both severely delayed speech and highly inconsistent error patterns
- Missing from the literature are reports of treatment for children whose production of speech sounds become less precise as utterance length increases and whose language challenges include problems with word retrieval and formulation of ideas for expression.

PARTICIPANT

- Male - age 3; 10
- Hearing within normal limits; no significant OME history
- Normal structure/function of the speech mechanism; no oral-motor issues
- Cognitive abilities within normal limits [Kaufman Brief Intelligence Test - Second Edition percentile ranks: Verbal = 42, Non-verbal = 30, Composite = 34]
- Language comprehension within normal limits [Peabody Picture Vocabulary Test-Revised percentile rank: 37; Oral and Written Language Scales percentile rank: 47]
- Language production, including vocabulary and syntactic/morphosyntactic development, at the low end of normal for age level [Expressive Vocabulary Test percentile rank: 23; Oral and Written Language Scales percentile rank: 30]
- Frequent mazing, consisting of repetitions of words and non-word fillers, suggests difficulty retrieving words and formulating ideas for expression
- Age-appropriate vowel inventory; age appropriate consonant inventory includes the following: /m, n, w, p, b, t, d, k, g, h, f, v, s, z, j, ʒ, ʃ, ʒ/
- Consonant errors include medial and final deletions, substitutions for later developing sounds, and imprecise productions; imprecise production was the predominant error pattern with the same words becoming increasingly less precise as utterance length increased from two to more words

TREATMENT PROGRAM

The treatment period, at a university clinic, included an eight-week session during semester-one, followed by an eight-week semester break and a subsequent six week session during semester-two. The twice-weekly sessions were 50 minutes in duration. Each treatment session included the following elements.

Element 1. Practice, at the word and carrier-phrase level, consonants that are in the

child's consonant inventory at the spontaneous single word-level, to obtain consistent use of *best-production* in utterances that are systematically increased in length.

Sequentially target a nasal, stop, fricative, or affricate for two successive sessions

Use six pictured words, two per initial, medial, and final position

Use the following procedures and practice sequence:

- **Word imitation level:** shape *best-production* of each word, which may/may not be correct production and may/may not improve to correct by the second session
- **Word spontaneous level:** obtain consistent use of current *best-production*
- **Carrier phrase level:** shape *best-production* of all words in the carrier-phrase. Obtain consistent *best-production* of the target words and of the carrier-phrase. Systematically increase the carrier-phrase from one, to two, etc., words when the child maintains *best-production* at the current phrase length.

ACKNOWLEDGMENTS

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TREATMENT PROGRAM (Continued)

Teaching Strategies. Shape *best-production* by: modeling sound(s) to syllable(s) to word for imitation; raising and lowering fingers to mark the number of syllables in a word/the number of words in a phrase as each is modeled/produced in imitation/spontaneously; following immediate-imitation with delayed-imitation practice; and using a rebus to provide visual cues for phrase level production. During all practices, identify adult *best-production* as 'like dad says it' and other than adult *best-production* as 'almost like dad says it'

Element 2. Practice of categorical vocabulary at the word and carrier-phrase level to facilitate organization of words for retrieval. Require consistent use of *best-production*. Carrier phrases represent selected semantic relations/syntactic forms to facilitate simultaneous processing of both speech and language.

- Target each child-specific functional category (e.g., project materials) and vocabulary set (e.g., paper, scissors, glue, marker, sticker) for two successive sessions; parents encourage use of targeted vocabulary within daily activities/routines throughout the week during which the words are targeted
- Limit each categorical-vocabulary set to five or six pictured words
- Use the same carrier-phrase that targets a specific semantic relation (e.g., possessive + object, *my/your glue*) or syntactic form (e.g., AUX am + ing, *I'm using the glue*) for the two sequential sessions
- Use the same procedures and practice sequence as described for Element 1.

Secondary Elements.

- Structure conversational interchanges that the child initiates, as brief and repetitive language routines (e.g., if the child says he has a red shirt, invite the child to talk about whether or not dad has a red shirt, if the clinician is wearing a red shirt, etc.)
- Provide language stimulation by routinely expanding the child's spontaneous utterances to include correct syntactic forms and elaboration of syntactically correct utterances

TRANSCRIPTION AND CODING RELIABILITY

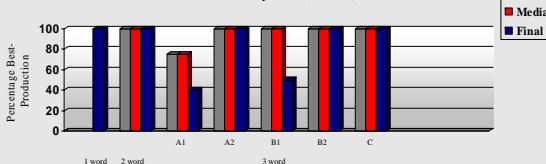
Initial and reliability transcription and coding were completed from video-recordings. Intra-judge reliability, three weeks after completion of the original transcription/coding, was 100% for precise and imprecise consonants, in a sample of 10% of the utterances, which contained 26% imprecise consonants.

RESULTS AND DISCUSSION

1) Typical performance for words with targeted sounds at the carrier-phrase level is represented in Figure 1 for /g/ and includes:

- consistent first try *best-production* in one- and two-word carrier-phrases (e.g., 'hit <word>', 'hit my <word>')
- reduction in frequency of first try *best-production* during the first of two sessions when the carrier-phrase length was increased to three words (see 3-word, A1)
- resumption of consistent first try *best-production* during the second of two sessions when the carrier phrase length was three words (see 3-word, A2)
- continued consistent first try *best-production* in three-word carrier-phrases, eventually for all positions, in different carrier-phrases of the same length (see 3-word, B2 and C)

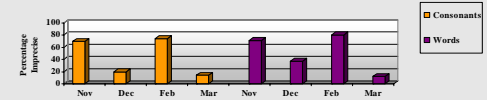
Figure 1. Percentage first try *best-production* of /g/ in carrier-phrases of one, two, and three words, and in different three word carrier-phrases (A, B, C).



RESULTS AND DISCUSSION (continued)

2) There was an increase in the preciseness of the child's speech production, but only while receiving treatment. As shown in Figure 2, during spontaneous conversational speech, the percentage of imprecise consonants and the percentage of words containing one or more imprecise consonants, decreased within each semester (note entries for Nov - Dec and for Feb - Mar) and increased during the semester break between semester-one and semester-two (note entries for Dec - Feb).

Figure 2. Percentage of imprecise consonants and words* containing one or more imprecise consonants during conversation.

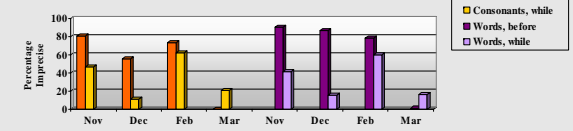


*Both intelligible and unintelligible words were included

Reports from the parents were consistent with the data in Figure 2; namely, increased intelligibility during semester-one and regression to pre-treatment levels of unintelligibility during the semester break between the end of semester-one and the beginning of semester-two.

3) Although the treatment program did not have a lasting effect on the child's speech production and resulting intelligibility, it did produce short-term improvements which the data in Figure 3 suggest were the result of the child's focus on his speech production at some level of consciousness. As shown in Figure 3, during spontaneous conversational speech within treatment sessions (for an equivalent number of utterances *before* and *while* working on a target), the percentage of imprecise consonants and the percentage of words containing one or more imprecise consonants, was higher at the beginning of the session, *before* work on any target was initiated, and subsequently lower during the session *while* work on a target was being conducted (note entries for Nov, Dec, Feb). Although this trend was not evident for March, the 0% occurrence of imprecise productions *before* work on a target was initiated was not typical; during this period, the child's spontaneous speech continued to contain both precise and imprecise productions, even while the overall frequency of imprecise productions was noticeably reduced (note entries for Mar).

Figure 3. Percentage of imprecise consonants and words* containing one or more imprecise consonants during conversation before and while working on a target during a treatment session.



*Both intelligible and unintelligible words were included

4) Tradeoffs in consonant preciseness did not appear to be related to expressive language status. Tradeoffs between speech and language (e.g., Masterson & Kahmi, 1992) were only apparent Dec to Feb when consonant preciseness decreased as syntax improved and frequency of mazing decreased. In contrast, when consonant preciseness increased a) syntax was static with decreases in frequency of mazing from Nov to Dec and b) syntax improved with no changes in the frequency of mazing from Feb to Mar.

REFERENCES

- Fey M. E., Cleave, P. L., Revida, A. J., Long, S. H., Dejmala, A. E., & Easton, D. L. (1994). Effects of grammar facilitation on the phonological performance of children with speech and language impairments. *Journal of Speech, Language, and Hearing Research, 37*, 594-607.
- Gierut, J. (1998). Treatment efficacy: functional phonological disorders in children. *Journal of Speech, Language, and Hearing Research, 41*, S85-S100.
- Hoffman P. R., Norris, J. A., & Monjure, J. (1990). Comparison of process targeting and whole language treatments for phonologically delayed preschool children. *Language, Speech, and Hearing Services in Schools, 21*, 102-109.
- Masterson, J. J., & Kahmi, A. G. (1992). Linguistic trade-offs in school-age children with and without language disorders. *Journal of Speech and Hearing Research, 35*, 1064-1075.
- Matheny, N., & Panagos, J. M. (1978). Comparing the effects of articulation and syntax programs on syntax and articulation improvement. *Language, Speech, and Hearing Services in Schools, 9*, 37-61.
- Shriberg, L. D., Tomblin, J. B., & McSweeney J. L. (1999). Prevalence of speech delay in 6-year-old children and comorbidity with language impairment. *Journal of Speech, Language, and Hearing Research, 42*, 1461-1481.
- Tyler, A. A. (2002). Language-based intervention for phonological disorders. In S. L. Velleman (Ed.), *Seminars in Speech and Language: Updates in phonological intervention* (pp. 69-81). New York: Thieme.