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Introduction

- Phonological and stuttering disorders frequently co-occur (Byrd, Wolk, & Davis, 2007).
- When they do, it is difficult to decide how to treat the disorders because treating the phonology directly may exacerbate the stuttering (Conture, 2001).
- One method of treating stuttering is through a combined fluency shaping and stuttering modification approach (Guitar, 2006; Kully, Langevin, & Lomheim, 2007).
- When phonological disorders co-occur with stuttering, they be may treated with an indirect approach to target the phonological disorder and a direct approach to treat the stuttering disorder (Wolk, 1998).
- Rationale for using an indirect phonological method is because direct methods place too much pressure on the articulators, thereby increasing risk of exacerbating the fluency disorder (Byrd et al. 2007).
- For children who exhibit a disorder in the production of sounds that do not affect phonemic contrasts, a modified traditional articulation therapy approach may be used.

Research Questions:

- Will an indirect use of traditional articulation therapy embedded in a direct therapy for a co-occurring fluency disorder improve articulation?
- Will the addition of an indirect articulation approach hinder fluency therapy?

Methods

Participant

- The participant was a 14 year, 6 month male whose developmental milestones appeared later than expected.
- At age 3;6 years, the client's speech was unintelligible to most people.
- Testing in early childhood revealed a mild to moderate cognitive impairment, severe developmental apraxia with mild dysarthria, hypotonia, and delays in receptive and expressive language.
- Stuttering was noticed in kindergarten. The client's maternal grandfather also stuttered, and had a mild language delay.
- Fall 2007 testing (% = percentile) revealed the following:

Phonology	Fluency	Receptive Vocabulary	General Language	WISC-IV
GFTA < 1%	SSI: "Severe"	PPVT-IV: 14%	CELF-4(core): 2%	Full Scale: 55%
KLPA < 1%				

- CAI (Andrews & Cutler, 1974) resulted in a score of 9 negative responses out of 24 questions.
- The participant received speech and language intervention at both school and a local state college.
- At school, he received speech and language intervention three times a week; twice a week was devoted to language therapy and once a week to fluency therapy.
- At the local state college, concerns were expressed for both intelligibility and fluency; thus, goals in the present study targeted articulation and stuttering at a rate of once per week.

Procedures

There were 10 intervention sessions during the course of the therapy period.

Articulation

- A traditional articulation approach (i.e., Bauman-Waengler, 2008) was modified to treat the articulation disorder.
- Only indirect verbal modeling was provided during therapy; no direct (e.g., "put your tongue here; say it this way") cues were provided.

Stuttering

- A direct approach was used combining aspects of both stuttering modification and fluency shaping therapy (Guitar, 2006; Kully, Langevin, & Lomheim, 2007).
- Modification goals included the instruction and production of pull-out and continuous phonation strategies.

Results

Research Question #1

- The voiceless palatal /ʃ/ and voiceless /tʃ/ and voiced affricate /dʒ/ were targeted in all positions.
- Articulation accuracy increased for all sounds, with some demonstrating improvement across higher levels of language complexity (see Figures 1-3). For example, the voiceless palatal /ʃ/ showed improvement in the intervocalic position from the word to the sentence position (see again, Figure 1).

Research Question #2

- Frequency of disfluency was evaluated at each therapy session to determine overall effects of therapy on disfluency behavior during the therapy period (see Figure 4). On average, stuttered disfluencies varied slightly.
- Use of continuous phonation demonstrated significant improvement considering the reduction in cues needed to elicit the strategy while, at the same time, increasing grammatical complexity (see Figure 5).
- While use of pull-outs did show some improvement towards the beginning of therapy, progress was not consistent (see Figure 6).

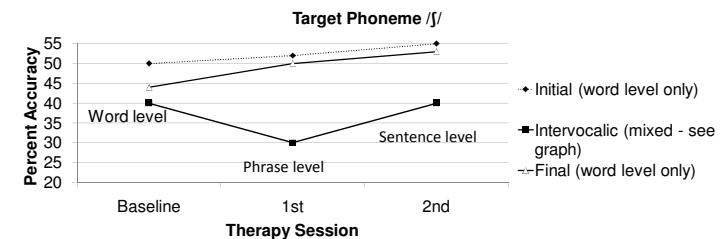


Figure 1. Percent accuracy of /ʃ/ during baseline and first two therapy sessions.

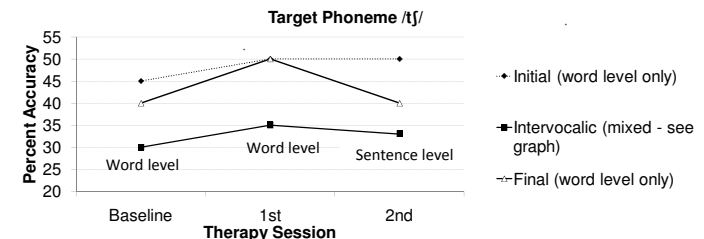


Figure 2. Percent accuracy of /tʃ/ during baseline and third and fourth therapy sessions.

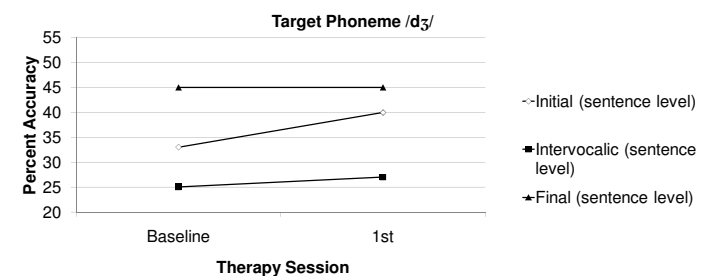


Figure 3. Percent accuracy of /dʒ/ during baseline and fifth therapy sessions.

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Results (continued)

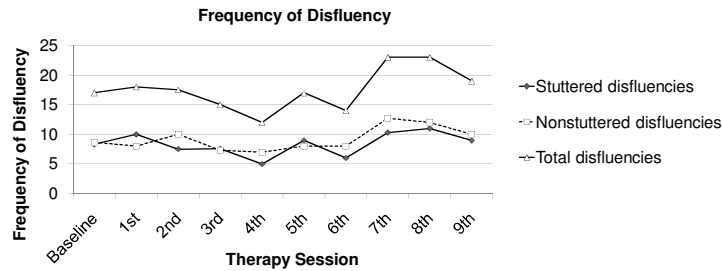
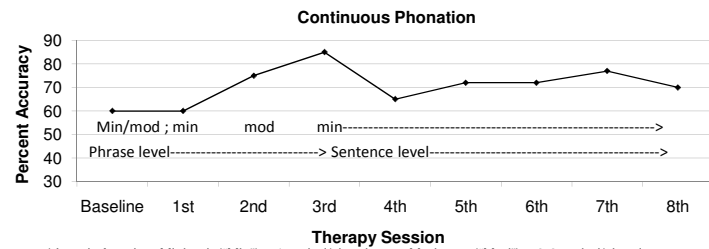
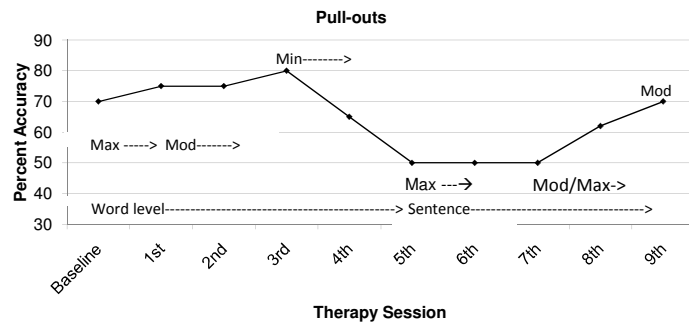


Figure 4. Frequency of disfluency across the entire therapy period.



* Level of cueing: Minimal ("Min") = 1 verbal/visual cues; Moderate ("Mod") = 2-3 verbal/visual cues.

Figure 5. Percent accuracy for continuous phonation during the therapy period.



* Level of cueing: Minimal ("Min") = 1 verbal/visual cues; Moderate ("Mod") = 2-3 verbal/visual cues; Maximal ("Max") = more than 3 verbal/visual cues.

Figure 6. Percent accuracy for pull-outs during therapy period.

Discussion

Few studies have been conducted that demonstrate a combined stuttering-phonology approach (Conture, Louko, & Edwards, 1993; Wolk, 1998).

- Conture et al., 1993 used an indirect approach for children who had both fluency and phonological (not articulation) disorders.
- In Wolk (1998), an indirect phonological approach (again, not articulation) was combined with direct management of a fluency disorder.

In the present study, a modified articulation (not phonological) approach was combined with direct fluency therapy strategies.

- Preliminary results indicate that the client made gains in both stuttering and articulation.
- Progress may have been slowed in the present study because of the participant's decreased cognitive ability.
- Progress also may have been a bit slower overall than one might have expected if the two disorders were treated individually and directly (Conture, 2001).

Implications are that fluency skills did not seem to be hindered; in fact, they seemed to improve with the implementation of an indirect articulation therapy approach.

- Because this is a single case study, it should be noted that this study is meant only to provide associative relationships, not causative.
- Additional (case) studies will need to be conducted to further support the need for treating phonology indirectly when stuttering and phonological disorders co-exist.

References

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