

Production disorders following stroke can be more resistant to treatment than problems in the comprehension of speech (Basso, Capitani, & Vignolo, 1979). Moreover, the data on late recovery suggest that recovery of language can continue to occur for years after formal treatment has stopped, but that these improvements usually are greater for comprehension than for production (Lomas & Kertesz, 1978).

The mechanisms underlying these expressive problems are not well understood, but one factor may be an inability to inhibit words in the mental lexicon that are semantically and/or phonologically related to the target the individual is trying to produce (e.g., Biegler, Crowther, & Martin, 2006; Dell & Gordon, 2003). If an individual could improve his/her ability to inhibit competitors, it might result in improved expressive output. The purpose of this case study was to determine whether a treatment that required a speaker to rapidly produce pairs of competing words would produce a positive effect on expressive output.

Method

Participant

The participant was a 62 year-old man who was four years post-onset of a left hemorrhagic CVA. Prior to his stroke, he had been a radio engineer. He demonstrated a right hemiplegia and a non-fluent aphasia. The participant's spontaneous speech was limited to occasional single words and gestures. His aphasia quotient on the Western Aphasia Battery-Revised (WAB-R) was 38.6. Receptive language was much better than expressive. On the Naming and Word Finding subtests he earned 49/100 points, while on the Auditory Verbal Comprehension subtests he earned 162/200 points. He earned 64/100 points on the reading subtests. The participant declined the writing subtests.

The participant demonstrated characteristics of both dysarthria and apraxia. He was hypophonic and had weak lip closure, occasionally drooling slightly when he was concentrating. He also demonstrated characteristics of apraxia of speech (Duffy, 2005), including consonant and vowel distortions and distorted substitutions, consonant clusters that were more in error than singletons, attempts to self-correct articulatory errors, false articulatory starts and re-starts, effortful visible and audible trial-and-error groping for articulatory postures, and difficulty initiating utterances.

He had been receiving speech and language therapy for the two years prior to this report. It had been suggested to the participant and his wife that after four years, the prognosis for speech recovery was not good, and that he might want to consider an AAC device. Both indicated to the first author that they preferred to continue to work on speech.

Treatment

Stimuli - The stimuli were phonological minimal pairs. There were two criteria for selecting the words. The first criterion was that they be picturable. The second criterion

was that they be words for which an auditory closure cue that was highly predictable could be developed (e.g., “An animal that meows is a _____” “To keep your head warm you wear a _____”). Twenty pairs were chosen for each session by the second author, who also developed the auditory closure cues. The second author presented each cue to the first author, who completed the cue verbally. Only pairs for which a response was produced within 2 seconds were included in the treatment sessions.

Procedure – Each member of a pair was elicited using a cueing hierarchy. The initial cue was the auditory closure (cloze) cue, described above. If the participant did not produce the word within 10 seconds, he was presented with the cloze cue plus the first phoneme of the word. If he did not produce the word within 10 seconds, he was given the cloze cue and the first two phonemes. If he did not produce the word within 10 seconds after the cloze cue and the first two phonemes, he was given the cloze cue and the entire word and asked to imitate the word. When the participant had produced the word, the cueing hierarchy was begun again. Once he could produce the word with one of the three types of cloze cues, the second member of the pair was introduced, and the same procedure was followed. If he could not produce the names of both members of the pair with one of the three types of cloze cue, the clinician went on to the next pair. If he was able to produce the name of each member of the pair with one of the three cues, the clinician began producing the cues as rapidly as possible, alternating back and forth between the two words. When the participant had produced at least four productions of each member of the pair, the next pair was introduced.

Outcome Measure – The participant was asked to describe 12 black and white line drawings of scenes such as a man stuck in a tree while attempting to rescue a cat, a family stuck on a road while the father changes a flat tire, and a yard sale. He was asked to say as much as he could about each picture. He was provided with no cuing and told that he should do the best he could and that it was ok if he could not say anything. The participant was probed using the picture description task on two occasions prior to the initiation of the treatment, at the beginning of the 9th therapy session, and at the beginning of the final session.

Results

The participant underwent 17 treatment sessions. Accuracy of production of the word after the cloze cue alone progressed from 8.8% during the first session to 31% during the final session. During his initial two attempts at describing the 12 pictures, the participant was unable to produce any words to describe any of the pictures. During the 9th session, he produced a total of 32 single words to describe the 12 pictures with a range of 1-6. During the final session, he produced a total of 45 single words with a range of 2-6. In addition, the participant’s wife (who was not aware that there was anything different about the treatment, even though she often watched the sessions) noted that he was producing more spontaneous speech at home, although it was still confined mainly to single words. She also offered that he seemed more engaged and laughed more frequently.

Discussion

The results of this preliminary case study suggest that Rapid Minimal Pair Treatment may improve expressive output. While the effects were modest, it appears that there was some generalization from the treatment to a more spontaneous speech task. There is also some tentative evidence that it carried over to home, although we did not formally assess this. Finally, the study suggests that improvement in production is possible, even after four years. One factor that influences word production/perception is the density of the neighborhood that a word lives in (how many competitors it has). We did not control for neighborhood density, and it is not clear how controlling for density would have affected our results, since density has different effects on production and perception. In future work we will try to develop stimuli that meet the criteria that we employed, while also controlling for density. In addition, we would like to try fading out the cues, while maintaining the rapid alternating production. If accepted, we will bring movies of a treatment session for CAC attendees to view.

References

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