Script Training for Co-occurring Dysarthria and Apraxia of Speech

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Introduction

Production of language is compromised in individuals with aphasia, apraxia and dysarthria of speech

- Aphasia: loss of ability to understand or express speech
- Apraxia of speech: neurological disorder that affects the brain pathways involved in planning the sequence of movements involved in producing speech
  - not caused by weakness or paralysis of the speech muscles
- Dysarthria of speech: speech disorder caused by muscle weakness due to brain damage

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Dysarthria

- Dysarthria is present in many neurologic diseases (stroke, TBI, Parkinsons) and its true incidence and prevalence is not fully known
- Common speech characteristics: short phrases, reduced loudness, forced expiration/inspiration, voice flutter/tremor, aberrant voice quality (roughness, breathiness, strain), imprecise consonants, distorted vowels, prolonged intervals of speech

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Script Training

- Purpose: facilitates the acquisition and retention of relatively automatic, functional, utterances through repetition and feedback (Youmans, Holland, Munoz & Bourgeois, 2005)
- Reinjects islands of automatic speech
- Client-centered
  - Personally relevant scripts
- Conversational context-based treatment
- Treatment has been done on clients with aphasia and apraxia of speech

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Research Objective

- Traditional speech therapy isolate impaired components of speech (i.e. word finding or grammatical rules) and focus on drilling these skills outside of a natural, linguistic context
  - Does not concentrate specifically upon reintroducing automaticity and clarity to the speech production and also does not easily generalize to non-therapy contexts
- The present study investigates a script training approach to facilitate automatic, precise production of specific, trained scripts

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Client Selection Criteria

- Adequate auditory comprehension
  - 6 of 10 in the Western Aphasia Battery assessment
- Several months post CVA (cerebrovascular accident) injury
- Interested in speech-focused treatment
  - Narrow form of treatment (vs total communication treatments)
  - Retaining functional phrases

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Selection of Scripts

- Client – led discussion
- Functional and personally important
- Script lengths dependent on client's impairment
- Scripts made up of client's words
- Past script topics
  - The perfect martini
  - Party host
  - Explaining speech-language abilities

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Participant

- Single subject design across behaviors
- 81 year-old male with a primary diagnosis of mild-moderate unilateral upper motor neuron dysarthria
  - Co-occurring mild apraxia of speech and mild anomia
- 13 years Post Left Hemisphere CVA
- Primary concern of participant is difficulty being understood by others

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Methodology

- Prior to participation, the participant completed formal testing comprised of the Western Aphasia Battery, The Assessment of Dysarthric Speech, and the Apraxia Battery for Adults
- Three, short 4-sentence scripts were created of personal importance to the client
- Script training occurred during 30– 45 minute sessions once/week with a cueing hierarchy to train new material (phrase repetition, reading of phrases with the clinician, and then independent production)
    - The participant was also expected to practice scripts at home for 15 minutes per day

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Methodology Continued

- Script production accuracy was the primary measure of treatment effectiveness.
    - Defined as the number of script words accurately produced.
- Script mastery: when ~ 90% of the entire script was mastered
    - Begin new script once client reaches script mastery
- The therapy sessions were recorded, transcribed, and coded for script accuracy

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Script Coding

"The name the name of the team that I am - routin for is um the - Op Oklaahomans, opa , the oba, oba okla-homans is mine and the other one the other team who is a *** is the um - the – Antono (Antonio) - Spores (Spurs)"

Key

* : unintelligible words

- : pauses

(): intended word

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Client's Testing Scores

- WAB Quotient: 80 out of 100
- Assessment of Intelligibility of Dysarthric Speech
  - 78% single-word intelligibility score
  - 76% sentence level intelligibility score
  - 41.2 intelligible words per minute

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Client's Scripts

Script 1 (Sports)

- I am a big fan of the Oakland Raiders
- One of my favorite teams is the Oklahoma Thunders
- I also like the San Antonio Spurs
- I am beginning to follow the Dallas Cowboys

Script 2 (Advice for Democrats)

- Which candidate is most likely to beat Trump?
- Trump is vulnerable to the candidate he is most afraid of.
- Who is your favorite Democratic candidate?
- The Democrats need to ignore Trump's dirty tricks.

Script 3 (Bernie & Biden)

- I would like him to select Bernie Sanders as his running mate
- Biden is the only one with enough experience to beat Trump
- Joe Biden should be the party's nominee
- Beating Trump is the main priority for the Democratic party

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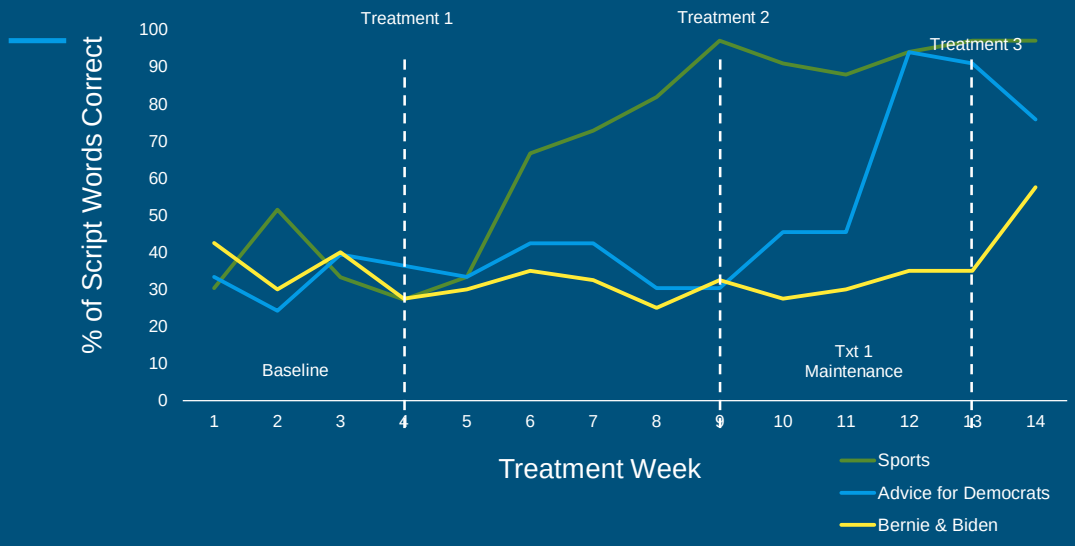
Script Training Development



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Conclusion

- The client began to show script mastery (~ 90% accuracy) only when there was focused treatment on the script
- Script maintenance was supported once the next script treatment began
- Script training appears to be an effective treatment for some individuals with dysarthria and/or apraxia of speech

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Limitations

- Small sample size
- No way to regulate at-home practice
- General self-reporting of participant's confidence level
- Inconsistency of script difficulty and naturalness
  - i.e. "vulnerable" from Script 2 and "priority" from Script 3

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Future Research

- Long term script retention study
- Studies with a larger sample with two groups, one receiving script training and the other receiving traditional speech therapy to examine relative successes in speech production and spontaneity

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