Maximizing Generalization in Severe Aphasia: Script Training Versus Scenario Training

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Background & Purpose
- Aphasia therapy is known to be effective in terms of improvement of specific, treated items in a given context in order to restore as much language and cognitive processing as possible (Thompson & Worrell, 2008).
- However, generalization of these gains to untaught stimuli and novel functional contexts has been problematic, especially for those with severe aphasia (Lynn, 1998).
- To circumvent this, it has been suggested that clinicians working with individuals with severe aphasia train directly functional stimuli in functional contexts (Davis, 2007).
- Conversational Script Training is designed to do just this (Holland, 2010).
- Script training is a functional approach to aphasia therapy that is used to facilitate participation in personally relevant conversational activities. Scripts can guide identification of participants and actions that are required in particular social situations by providing the client with more knowledge of a given situation allowing recall of the temporal organization of events in routine activities (Holland, 2010).
- The contextual nature of script training leads to improved functional outcomes for individuals with severe aphasia. It follows that further increasing the contextual richness of a treatment paradigm might provide even better outcomes in terms of (a) rate of mastery, and (b) amount of material mastered.
- We hypothesized that, compared to conventional script training, Scenario Training, would lead to improved treatment outcomes in terms of (a) rate of learning, and (b) amount of expressive communication for specific contexts, compared to conversational script training, for an individual with severe aphasia.
- We tested whether a novel treatment paradigm, Scenario Training, would lead to improved treatment outcomes in terms of (a) rate of learning, and (b) amount of expressive communication for specific contexts, compared to conversational script training, for an individual with severe aphasia.
- We hypothesized that, compared to conventional script training:
  - Scenario training would enhance generalization for individuals with severe aphasia. Given a contextual rich environment, appropriate language use would increase as a result of greater comprehension (i.e., enhanced semantic network) for a given situation.
  - Scenario training would lead to greater or global gains in expressive language.

Participant & Procedures
- Single-subject, multiple-baseline across behaviors design
- **Participant:**
  - 57 year old male, Jxx, 18 months status post a large left-hemisphere CVA.
  - Severe, global aphasia initially, resolved to severe Broca’s aphasia (i.e., slight increase in auditory comprehension for very simple yes/no questions) by the time of this study (Table 1).
  - Jxx was enrolled in outpatient speech-language therapy from 6 to 12 months post-stroke, during which time his WAB aphasia index scores increased from 26.5 to 29.7: i.e., just short of “clinically significant change” (5.5 points, Shewan & Donner, 1988).
  - Similarly, Jxx and his family noted little noticeable functional improvement during this time.
  - Jxx participated in an intervention-induced language training program, in preparation for discharge from the program during the summer of 2010 with additional improvement in WAB scores (from 29.7 to 34.8) but again, little direct functional impact.
- **Treatment protocol:**
  - 90 min. weekly sessions over a 10-week period, with an additional 30-60 minutes per day of home practice required.
  - Conversational Script Training was alternated with Scenario Training at every other treatment session (Table 2).
  - A total of three scenarios were trained using both methods with order of training systematically varied between training methods (Table 2).
- **Script training procedures:**
  - Clinician provides scripts appropriate for clients’ language abilities (e.g., for Jxx, 1-4 word phrases) and life contexts. Client must produce the scripts accurately with cueing as required from the clinician. The client is encouraged to practice the scripts often so that the phases are said more clearly and may become committed to memory. The focus of this protocol is to produce appropriate responses given a particular context with little to no error (Holland, 2010).
- **Scenario training procedures:**
  - Exposure to a particular contextualized environment is critical for this method. This procedure encourages as “rich” a context as possible by using materials such as videos, pictures, toys, or volunteers pertaining to a specific functional task. Interactions between the client and clinician are conversational in nature, such that the client is a equal partner in language expression (Davis, 2007). The focus of this protocol is to aid comprehension of a particular situation by immersing the client in that context while eliciting accurate language.
  - Probes were completed at the beginning of each treatment session. Thus, probe data measured the maintenance of material from the previous week's treatment session and homework assignments (Figure 1).
- Post-treatment testing was completed immediately following treatment (Table 1).

Results
- **Pre-versus post-treatment testing:** ASHA-FACS scores increased in overall Communication Independence and Qualitative Dimension (Table 1). Jxx’s family noted improvement in daily communication; his wife reported that this was the first time Jxx had given a (scripted) four word response since the stroke.
- **Within treatment performance:** Each treatment protocol entailed different advantages. During the conversational script training, Jxx was able to express appropriate 4-word responses through practice and memorization of scripts. During the less scripted scenario training, Jxx often used neologism means (e.g., gesture) to engage with others in trained situations, demonstrating enriched comprehension. Jxx unexpectedly applied to combine the two treatment protocols to his advantage, by using the rehearsed scripts as a catalysts for expression in scenario training.
- **Probe performance:**
  - Baseline stability: A slight increase in accurate responses was noted during the baseline period. Since the functional context was specifically targeted in treatment, visual inspection showed the accuracy of correct words produced as applied in comparison to the baseline (Figure 1).
  - Maintenance effects: Accurate responses for a particular context declined after the initial spike following the targeted treatment, yet continued to remain higher than baseline performance (Figure 1).
  - **Order effects:** Data revealed little noticeable change in performance during functional contexts treated initially with script vs. scenario training: that is, similar successful results were obtained regardless of the order of training techniques (Figures 1 and 2). On a subjective basis, however, clinicians felt that practicing conversational script training first facilitated application of the rehearsed scripts to scenario training.

Conclusions
- This study demonstrates the complex relationship between treatment, pre- and post-test, and probe measures, as well as patients’ and families’ perceived improvement.
- Our initial hypothesis was that the richer context of scenario training would promote increased generalization compared to script reading for severe aphasia, yet upon reviewing the results, the most significant improvements were demonstrated at the conclusion of both treatment protocols for a given functional task. Both Jxx and the clinician found a natural progression in using the rehearsed scripts as a catalyst of expression for scenario training.
- The family centered treatment model successfully encouraged the family members to have an active role in Jxx’s treatment. Since the functional tasks were relevant to Jxx’s daily life, the family was able to clearly see the benefits of therapy, as reflected in ASHA-FACS scores.
- Similar to previous research, Jxx demonstrated situation-specific gains with little to no change in more general measures of language (i.e., the WAB and BDAE subtests) over the course of this study.

References
- *Telephone.* 1300: 1234
- *Scenario.* 1300:1234
- *Meal.* 1300:1234
- *Western Aaphasia Battery.* 1300:1234
- *Amaz’s Fables (ROD).”* 1300:1234

Table 1: Selected Pre- and Post- Treatment Test Scores

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<th>Assessment Test</th>
<th>Pre Treatment</th>
<th>Post Treatment</th>
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<td>Communication of Basic Needs</td>
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<td>Language Planning</td>
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<td>Social Communication Score</td>
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Table 2: Treatment Protocols and Procedures

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Figure 1: Treatment Baseline and Probe Results

Figure 2: Functional Tasks Practiced with Probe Responses