Summary

This pilot study suggests that the lexical characteristics of treatment words can lead to different treatment outcomes. Real word (RW) treatment improved a child’s production of the treated sound cluster, /str/, while non-word (NW) treatment resulted in greater systemwide phonological change, for both singletons and untreated clusters. Thus, while the lexical familiarity of RWs may make them easier to access and process, NWs may better help children learn the sound structure of words. These results could be interpreted by Dell & O’Seaghdha’s (1991) spreading activation model.

Background

Training children with speech sound disorders to produce more complex (numeric) structures often results in the emergence of more simple but related unmarked structures (reviewed in Gierut, 2007). One of the most complex phonology tasks in the English language is the three-element word-initial consonant cluster (e.g., /str/). Gierut and Champion (2001) examined the phonological change that occurred in conjunction with speech treatment that incorporated non-words (NWs) beginning with three-element clusters and observed that all children increased their production accuracy of the treated clusters. However, there was little or no transfer of learning to other three-element clusters. Alternatively, large amounts of change in singleton consonants and two-element clusters were observed.

Since Gierut and Champion (2001) only used non-words in their treatment approach, it is questionable whether their results could be generalized to contexts in which more consistent patterns of mixed treatment groups (RWs or NWs). Using a multiple baseline design, both children were treated with the complex cluster /str/, with the treatment targets varying by word-lexicity.

Phonological complexity: Using three-element clusters in speech sound disorder treatment
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Participants

Methods

Participants

<table>
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<tr>
<th>Age of onset of Treatment</th>
<th>RW (N=10)</th>
<th>NW (N=10)</th>
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<tr>
<td>Mean</td>
<td>3.0</td>
<td>3.1</td>
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Comparison of error rates across treatment groups revealed non-significant differences on the Total error measure.

Pro-Treatment Cluster Sensitivity Trails

- RW: Mean = 21.0, SD = 11.0
- NW: Mean = 22.5, SD = 12.0

Accuracy was calculated for the treated cluster /str/, in untreated words.

Results

Question 1: Do RWs or NWs elicit more system-wide phonological change?

Method

Each child’s phonemic inventory was examined to determine if any new phonemes were added, based on the criterion of two unique sets of minimal pairs (e.g., ‘sing’/’sing’ or ‘run’/’rub’), regardless of whether they were correct relative to adult production (Gierut, Simmons, & Neumann, 1994).

Treatment Advantage: Non-Words

NW change = -.32
RW change = +.30

NW change = -.40

Question 2: Do RWs or NWs elicit greater magnitude of change in untreated singletons, two-element clusters, and/or three-element clusters?

Method

To evaluate how word-lexicity (i.e., real words vs. non-words) affects treatment outcomes, we examined the change in children’s productions from pre-treatment to post-treatment using a multiple baseline design with two groups of children (one presented in RWs and one in NWs). Overall, NWs generated the amount of learning that took place during treatment when their treatment approach. Gierut and Morrisette (2010) examined the phonological change that occurred in conjunction with speech treatment that incorporated non-words (NWs) beginning with three-element clusters and observed that all children increased their production accuracy of the treated clusters. However, there was little or no transfer of learning to other three-element clusters. Alternatively, large amounts of change in singleton consonants and two-element clusters were observed.

The the children participated in a maximum of 12 one-hour treatment sessions that occurred twice weekly. Two phases of treatment occurred: imitation and spontaneous productions. The imitation phase began with a child maintained 75% accurate production of the treated phoneme over two consecutive sessions (i.e., five sessions or criterion) and five consecutive sessions were completed (i.e., time-based criterion), both children achieved the performance-based criterion. The spontaneous production phase of treatment continued until a child maintained a performance-based criterion of 90% accuracy production of the treated phoneme over three consecutive sessions, or a time-based criterion of seven sessions. Neither child achieved the performance-based criterion; thus, they both completed all seven spontaneous production sessions.

The phonological change on the treated cluster and untreated singleton consonants and clusters was examined via the adm- inistration of a 250-word singleton probe and a 143-word probe specifically targeting word-initial clusters.

Question 3: Do RWs or NWs elicit higher production accuracy levels in treated three-element clusters?

Method

Overall accuracy via a percent consonants/clusters correct (PCC) measure was calculated for the treated cluster, /str/, in untreated words.

Treatment Advantage: Real Words

Question 4: Do RWs or NWs elicit higher production accuracy levels in untreated singletons, two-element clusters, and/or three-element clusters?

Method

Overall accuracy via a percent consonants/clusters correct (PCC) measure was calculated for: 1) singletons produced with less than 50% accuracy pre-treatment, 2) all two-element clusters, and 3) all untreated three-element clusters. To calculate the effect size, d, the mean of baseline data (MB) was calculated for the treated cluster, /str/, in untreated words.

Treatment Advantage: Non-Words

Question 5: Do RWs or NWs better reconfig- figure a child’s production variants (i.e., substitutions) of treated three-element clusters?

Method

An error consistency index (EC, Tyler & Lewis, 2005) measure was calculated by summing the total number of different productions (correct and incorrect) that each child made for his/her treated three-element cluster.

Disclosure Statement and Acknowledgements

We do not have any affiliations or non-financial relationships relevant to the content of this poster presentation. We would like to thank Brianne Jallo, Morgan Techer, and Julian Kolquist for their help with data analysis and poster preparation. We would also like to thank the children who participated in this study.