

Final Consonant Cluster Reduction In African American English Dialect

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INTRODUCTION

- Children from low-socioeconomic status (SES) families generally speak a non-mainstream dialect of English, such as African American English (AAE).
- Dialect mismatch between the language of instruction (Mainstream American English or MAE) and the non-mainstream dialect (NMAE) may be detrimental to success in school.
- Dialect mismatch is one reason for the achievement gap.

Characteristics of AAE, an NMAE dialect:

- A common phonological characteristic of AAE is final consonant cluster deletion (e.g. *goal* for *gold*).
- A common morphological characteristic of AAE is omission of plural-/s/ marking if there is another indicator of number (e.g., "fifty cent").

Purpose of this study:

- Do children from low-SES families who speak AAE produce longer word durations for words which have "deleted" final consonants or plural-/s/ marking?
 - Is the word /kol/ (for *cold*) longer than the word /kol/ (for *coal*)?
 - Is the word /dag/ (for *dogs*) longer than the word /dog/ (for *dogs*)?
- If so, are these longer durations systematically related to individual differences, such as comprehension of SAE or vocabulary size?

Importance of this study:

- Children from low-SES families are at high risk for academic failure.
- Since MAE is used and taught in schools, the dialect mismatch between MAE and AAE may be detrimental to children's success
- The goal of this project is to investigate NMAE dialect speakers' understanding of MAE.

Participants:

- 99 African American children
 - 48 boys and 51 girls
 - Age range: 48 to 105 months.
- Approximately 76% of the children were from low SES families
- All participants were part of a, larger study on the impact of dialect mismatch on academic achievement.

METHODS

Stimuli:

- Pictureable one-syllable words that were familiar to children :
 - Words were ambiguous in AAE because:
 - final consonant clusters are reduced (e.g., *goal* vs. *gold*).
 - Plural endings are omitted (e.g., *cat* vs. *cats*)
 - A third unrelated picture (filler) was also included in each set of three pictures
 - Auditory stimuli: Recordings by a young adult female speaker of MAE.
 - Visual stimuli: Color photographs of objects

Procedure:

1. Familiarization: Children listened to the picture-names produced by an adult AAE speaker and repeated each one as they looked at the pictures. Children's productions were digitally recorded.
2. Identification: Children were asked to touch the correct picture to match the word they heard in MAE.
3. The purpose of this task was to measure the children's ability to understand words spoken in MAE.



Figure 1. Sample trial: Show me *goal* please.

Other measures:

- We also measured sentence comprehension (TACL), expressive vocabulary (EVT-2), receptive vocabulary (PPVT-4) using standardized tests. and dialect density.
- Dialect density was measured from a 50 utterance language sample.
 - The language sample was transcribed orthographically.
 - Then the dialect features were counted and divided by the total number of words in the sample.
 - Dialect coding was done by a native speaker of AAE.
- An analysis of whether the results discussed later were related to these subject-level individual differences revealed no significant relationships.
- This result may be because these analysis did not include children who produced final consonant clusters correctly.

ANALYSIS (heading same as the other 3 columns)

- All words produced by the children in the familiarization phase were transcribed.
- Durations of all words produced by children in the familiarization phase were measured, using Praat, a digital waveform editor.
 - All words began and ended with consonants.
 - The entire duration of the word from the beginning of the initial consonant to the end of the final consonant was measured for all stimuli items.
 - For items that had a voiceless consonant preceding the vowel (? out of ? Stimulus items), the duration of the *rime* (interval from vowel onset to the end of the word-final consonant) was also measured.
- Both the waveform and spectrogram were used to make three acoustic boundaries:
 - Beginning of word-initial consonant (cOnset)
 - Vowel onset (vOnset)
 - End of final consonant (wEnd)
- For each boundary, vertical striations in the spectrogram were used as the main guidelines for placing the boundary; these vertical striations indicate the presence of voicing.
- Formant tracks were also an indicator of voicing and the beginning of each vowel; they were able to supply additional information because they track the spectral peaks of the sound, therefore, indicating that voicing is present.
- An example of these the three acoustic boundaries is shown in Figure 2:

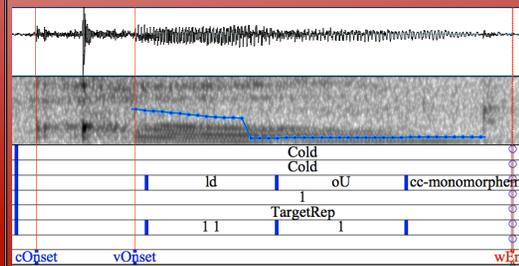


Figure 2: Duration measurements for one token of "cold": waveform (top) and spectrogram (bottom) are shown.
1. "cOnset": beginning of the word.
2. "vOnset": beginning of the vowel.
3. "wEnd" end of the word.

RESULTS

Analysis:

- Average word and rime durations for each child were computed for two sets of words (see Fig. 3):
 - Target words without final consonant clusters in which the final consonant was produced correctly (e.g. *coal*, *star*).
 - Target words with final consonant clusters in which the final consonant was omitted (e.g., /kol/ for *cold*, /star/ for *stars*).
- Paired comparison t-tests were used to compare the durations of these two sets of words.
- These t-tests were run separately for the monomorphemic words (*coal/cold*) and the bi-morphemic words (*star/stars*).
- For the bimorphemic words, words with a target final consonant cluster (but with a deleted final consonants) were significantly longer than words with a singleton final consonant (as predicted).
- For monomorphemic words, words with a target final consonant cluster (but with a deleted final consonants) were significantly *shorter* than words with a singleton final consonant (opposite to predicted result).
- This effect disappeared when we included only stimuli in which the consonants in the cluster matched for voicing (e.g., *gold* but not *cart*).

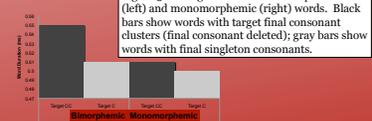


Figure 3. Average durations of bimorphemic (left) and monomorphemic (right) words. Black bars show words with target final consonant clusters (final consonant deleted); gray bars show words with final singleton consonants.

DISCUSSION

- One of the two comparisons showed the predicted effect:
 - Children who speak AAE produce longer words when the plural marking is deleted, even though all of the same sounds are produced in the singular word and the word with the plural marker deleted.
 - This suggests that children who speak AAE have knowledge of plural marking even when they don't produce it.
- It also should be noted that the participants were saying only a single word that wasn't in sentence form, so the results might have been different if we recorded sentences or spontaneous speech.