

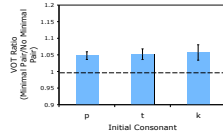
Moving new words into the neighborhood: A preliminary report

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Introduction

- Evidence suggests word level properties can affect phonetic realization of words.
- Vowels in high-density neighborhoods are hyperarticulated and more coarticulated (Wright, 2004; Munson, in press; Scarborough 2003).
- Baese and Goldrick (submitted) show that lexically conditioned consonant hyperarticulation occurs independent of phonotactic probability.

- Specifically, words with minimal pair neighbors (e.g., *cod-god*) have longer VOTs than words without minimal pair neighbors (e.g., *cop-gop*).



Does this effect truly reflect contrasting lexical properties of words?

- May be an artifact of purely formal differences between the words (e.g., final /d/ in *cod* vs. final /p/ in *cop*).

Is this effect specific to the onset (i.e., specific to minimal pair contrast) or more global (e.g., leading to hyperarticulated vowels?)

- Impossible to completely control phonetic environment across words.

Focus of the current study

Examined productions of the **same** word before and after a neighbor was added to the lexicon.

<cop> (no competitor <gop>) vs.

<cop> (after competitor <gop> is introduced to the lexicon)

Completely controlling formal properties while manipulating lexical knowledge will allow us to:

- Attribute observed effects specifically to **lexical** properties.
- Examine both local and **global** phonetic effects.
- Examine influence of **listener modeling** by manipulating speaker knowledge independent of listener.

Previous Research: Word Learning

- Dumay and Gaskell (2007) examined perceptual consequences of learning words in a two-day training paradigm.
 - Day 1: Training and testing.
 - Training: Exposure to non-words (phoneme monitoring)
 - Testing
 - Lexicalization test (pause detection)
 - Recognition test (which of two items is familiar?)
 - Day 2: Testing only
- On Day 2, new words affected the *recognition* of existing neighbors.
 - Novel word <athedruke> slows recognition of existing <cathedral>.
 - Evidence that novel word has been lexicalized.
 - (n.b.: On Day 1 participants can recall new item, but it does not influence perception of existing neighbors.)
- Current study: On Day 2, can new words affect the *production* of existing neighbors?

Methods

Day 1

Baseline: List Reading

- Self-paced reading of words with and without existing neighbors (+fillers)
- 3 repetitions, randomized

Word Learning

Phoneme Monitoring

- 6 target phonemes, 3 repetitions each
- 18 repetitions of each training word
- Subjects respond yes/no to each trial

Repetition

- 18 repetitions of each training word
- Visual and auditory presentation
- Subjects repeat after auditory presentation

Recognition Test

- Two-alternative Forced Choice (which item did you learn?)
- Training word vs. untrained rhyming non-word (*gop* vs. *rop*)

Day 2

Test: List Reading

- Self-paced reading of word with existing and trained neighbors (+fillers)
- 3 repetitions of list, randomized

Recognition Test

- Two-alternative Forced Choice
- Presented with training word and untrained rhyming non-word

Materials

Target words: Pairs of words varying in whether or not they had an existing minimal pair neighbor were matched for a number of word level and phonetic properties.

- Lexical frequency (all low-frequency words, <20/million).
- Monosyllabic.
- Beginning with the same initial stop and vowel (e.g. /ka/).
- Phoneme length.
- Phonotactic probability (sum segmental and biphone probability).
- 12 pairs for each voiceless stop /p/, /t/, and /k/

Sample pair: <cod> (competitor <god>), <cop> (no competitor <gop>)

Training words: Non-word competitors for target words without existing minimal pair neighbors.

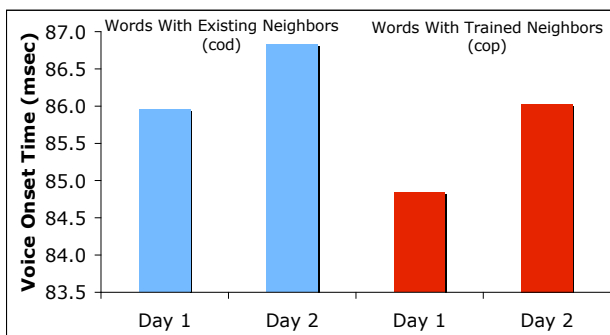
Sample training word: <gop>

Target words were embedded in a list with monosyllabic filler words in the list reading task and monosyllabic non-words in the training phase.

- None began with the target consonant.
- None rhymed with target words.
- Minimal pair competitors for targets (e.g., <god> for <cod>) were not presented within a session.
- Fillers beginning with stops did not have minimal pair competitors.

Preliminary Results

- 4/6 participants produce neighbors of trained words with longer VOTs than they did before training.
- Only 2/6 show increase in VOT for words with existing neighbors.



For 4/6, the size of the VOT change across days is greater for words with trained neighbors than words with existing neighbors.

- Mean difference: Existing neighbors 0.9 msec; Trained neighbors 1.19 msec

Planned Analyses

- Contrasting production-internal accounts of effect of neighbors
 - Competition:** Voiced and voiceless stops compete for selection; enhanced activation reflects increased competition from neighbors.
 - Predicts effects limited to contrasting segments in minimal pair.
 - Enhancement:** Neighbors boost activation of target; facilitates production of all aspects of target.
 - Predicts global hyperarticulation of target.
- Planned analyses
 - Hyperarticulation of vowel (duration, F1/F2); coda consonants (duration)

Future Work

- Control condition: No training; simply repeat lists 24 hours apart.
- Role of listener modeling
 - If effect of neighbors is influenced by listener modeling, should be reduced or eliminated when interacting with speakers that have not learned the new neighbor.

References

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