Perceptual Grounding for Long-Distance Agreement
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Introduction
A number of theories, including ABC, make use of explicitly non-local representations to model long-distance harmony processes (Rose and Walker, 2004; Gallagher, 2010; Kimper, 2011, and others).
Strict locality has been claimed to be necessary to maintain phonetic grounding in harmony.
- Assimilation only reduces articulatory effort between adjacent segments.
I argue that adopting explicitly non-local representations does not require surrendering phonetic grounding.

Perceptual Grounding
Harmony confers a perceptual advantage:
- Kaun (1995): Harmony gives the listener increased exposure to the relevant cues.
- Gallagher (2010): Harmony ensures that words consistently differ by multiple segments, increasing discriminability.
There is no obvious reason why this advantage would be limited to adjacent segments.

Method
Subjects: Native speakers of North American English (32 for Exp. 1 and 36 for Exp. 2).
Task: Subjects heard nonsense word, followed by a target vowel in isolation (ISI=750ms) and indicated whether or not the target vowel had been part of the preceding word.
Stimuli: CV syllable structure. Vowels: [a, e, i, o, u]. Onsets: [h, g, k, sk]. Targets: [i] or [u].

Experiment 1
Trisyllabic; potential targets [e, o, i, u]
- Either adjacent (followed by [a]) or non-adjacent (with [a] intervening).
- Either agreed or disagreed in colour.
Hypothesis: subjects should be faster and more accurate in harmonic conditions, for both the local and non-local conditions.
- U o a ... u > e a ... u
- U o a ... u > u e a ...

Accuracy by Harmony and Locality

Experiment 2
Quadrisyllabic; potential targets [e, o, i, u]
- Either adjacent, separated by one syllable, or separated by two syllables.
- Either agreed or disagreed in colour.
Each vowel combination was paired with one identical except for harmony (u o a a ∼ u e a a).
- For each subject for each vowel combination pair, a difference score (representing the advantage of harmony) was calculated on each measure.
Hypothesis: The advantage of harmony will diminish over distance, but persist.

Accuracy Advantage by Distance

Discussion
Experiments 1 and 2 found a perceptual advantage of harmony even among non-adjacent segments.
- This provides a source of phonetic grounding for theories like ABC which make use of explicitly non-local representations.

Some possible explanations...
- Priming. Repetition of a stimulus (in this case, a vowel feature) facilitates subsequent recognition (Tulving and Schacter, 1990; Bergerbest et al., 2004; Badgaiyan et al., 1999, and others).
- Chunking. Organising information into chunks (in this case, a single feature value for the whole word) facilitates memory (Miller, 1956; Gobet et al., 2001, and others).

Experiment 2 suggests that distance may be more important than contiguity, which seems to support a priming approach more than chunking.

References
Kiparsky, Paul. 1981. Vowel harmony. MIT.