Neither necessary nor sufficient: Re-thinking the role of contrast in vowel harmony

Wendell Kimper :: University of Manchester

Introduction

In languages with vowel harmony, some segments are exempt from the harmony requirement. These non-participating segments:
- Co-occur with vowels from either harmonic set.
- May be opaque (blocking further propagation).
- May be transparent (skipped over by harmony).

Central questions for a theory of harmony:
1. What qualifies a segment as exempt?
2. What determines whether non-participants are transparent or opaque?

Contrast

The notion of contrast has traditionally held a central place in explanations of non-participation in harmony systems (see e.g. Vago 1976; Archangeli and Pulleyblank 1994; Kiparsky and Pajusalu 2003, and many others).

I argue that contrast cannot be relied upon as a predictor of a segment’s participation in harmony, or as a predictor of a segment’s opacity.

(a) Contrastive pairing is not necessary.
- Harmonic alternations can occur even in the absence of a contrastive harmonic pairing.
- Non-undergoers can block harmony even if they are not contrastively paired.

(b) Contrastive pairing is not sufficient.
- A segment may be exempt from harmony even if contrastively paired.
- Non-undergoers can fail to block harmony even when they are contrastively paired.

Is it necessary?

In Kinande, [–ATR] non-high vowels lack contrastive counterparts (Archangeli and Pulleyblank, 1994, and others).

Kinande: Contrastive Inventory

[1] e-ɛ-lɛm-a ‘to cultivate’
[1] e-ɛ-nɛm-a ‘to cover’
[2] e-ɛ-nɛm-a ‘to beat’
[2] e-ɛ-nɛm-a ‘to cook’
[2] e-ɛ-nɛm-a ‘to carry’
[2] e-ɛ-bɔ-ɔ ‘to lie’
[3] e-ɛ-nɛkɛ ‘to force’

However, vowel harmony results in non-high [+ATR] vowels on the surface.

Kinande: Harmonic Alternations

[0–] e-ɛ-lɛm-a ∼ ɛ-mu-lɛm-i ‘farmer (cultivator)’
[0–] e-ɛ-nɛm-a ∼ ɛ-mu-nɛm-i ‘beater’
[0–] e-ɛ-nɛm-a ∼ ɛ-mu-hɛk-i ‘porter (carrier)’
[0–] e-ɛ-bɔ-ɔ ∼ ɛ-mu-bɔ-ɔ ‘tire’
[0–] e-ɛ-nɛkɛ ∼ ɛ-mu-nɛkɛ ‘force’

Gick et al. (2006) provide acoustic and ultrasound data showing that these alternations:
- Are of comparable magnitude to those of contrastive pairs.
- Do not diminish with iteration.

This suggests that these are categorical alternations (cf. subphonemic coarticulation).

In Yoruba, high [+ATR] and low [–ATR] vowels lack contrastive counterparts (Archangeli and Pulleyblank, 1994, and others).

Yoruba: Contrastive Inventory

[i] ɛ-ɡi ‘tree’
[u] ɛ-ɡu ‘to die’
[e] ɛ-be ‘head of yams’
[o] ɛ-o ‘money’
[a] ɛ-a ‘body’

These vowels do not undergo harmony, and behave as opaque in the Oyo dialect (Pulleyblank, 1996), despite the absence of contrast.

Oyo Yoruba: Opacity

[u] eɛɛ ‘(curly) goat’
[i] oɔɛ ‘(odd) parrot’

Is it sufficient?

In Khalkha Mongolian, both high and non-high vowels contrast for colour features (Kaun, 1995).

Khalkha: Contrastive Inventory

[i] ɪ-ɪ ‘eat-DIST’
[u] ɛ-ɛ ‘see-NARR,PAST’
[e] ɛ-xɛ-x ‘decorate-DIST’
[a] a-ɛ ‘enter-Causes’

Non-high vowels alternate harmonically, but high vowels do not undergo harmony.

Khalkha: (Colour) Harmonic Alternations

[i–] ɛ-xɛ-x ‘gown-foot–gown-foot-ACC’
[u–] ɛ-xɛ-x ‘gown-foot–gown-foot-ACC’
[e–] ɛ-xɛ-x ‘gown-foot–gown-foot-ACC’
[a–] ɛ-xɛ-x ‘gown-foot–gown-foot-ACC’

High and non-high vowels contrast for colour features to the same degree.

Contrast alone cannot distinguish participants from non-undergoers.

Khalkha: Non-Undergoers

[i] ɛ-xɛ-x ‘gown-foot–gown-foot-ACC’
[u] ɛ-xɛ-x ‘gown-foot–gown-foot-ACC’
[e] ɛ-xɛ-x ‘gown-foot–gown-foot-ACC’
[a] ɛ-xɛ-x ‘gown-foot–gown-foot-ACC’

Discussion

Contrast has played a central role in the literature on vowel harmony. This centrality is not merited by the empirical facts: contrast (or lack thereof) is neither necessary nor sufficient for harmony.

A theory of harmony in which contrast determines participation does not account for Kinande and Khalkha (and languages like them).

- Solution: Contrastive inventory and surface inventories are both separately influenced by segmental markedness.
- A theory of harmony in which contrast determines transparency/opacity does not account for Yoruba, Khalkha, and Finnish (and languages like them).

See Kimper (2011) for one possible implementation.

References