

Long-distance Segmental Phenomena

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1 Long-distance Phenomena

Today we examine long-distance phonological processes. By “long-distance”, I mean processes where sound changes occur due to sounds which are not *neighboring*.

Like local patterns, long-distance patterns can be diagnosed in two ways: as static effects over the lexicon, or as productive aspects of morphophonological alternation.

1.1 Spreading

In some languages, a feature *spreads* across several segments. Such patterns might be considered long-distance because the source of the change may be distant from where its effects are ultimately realized.

An example of nasal spreading comes from the Johore dialect of Malay (Onn, 1980). In this language nasal vowels and glides do not contrast with oral vowels and glides.

Malay (Johore dialect)	
[baŋõn]	‘to rise’
[mãjĩ]	‘stalk (palm)’
[mẽnãwãsan]	‘to capture (active)’
[pẽŋãwãsan]	‘supervision’
[pãmãndaŋãn]	‘scenery’
[mãkan]	‘to eat’

★ Let’s work out an analyses using rewrite rules, autosegmental rules, and OT.

Spreading is long-distance if the context is at the underlying level (the input). But if the context is at the surface level (the output) then it is local. Most analyses view spreading as a *local* one. In rule based theories, for instance this could be accomplished via rule application.

Rules may apply *persistently*, or they apply *iteratively* through the word. In this case, the rule would apply left-to-right through the word because the spreading is *progressive*. (Much

later we will see an example that could be analyzed as right-to-left spreading because the spreading is *regressive*.)

1.2 Consonantal harmony

Consonantal harmony refers to patterns where there is agreement between two consonants separated by at least one intervening consonant which does not share the relevant feature (Hansson, 2001, 2010; Rose and Walker, 2004). This is long-distance regardless of whether the context is said to be met in the underlying or surface forms.

Sibilant harmony in Navajo (Athabaskan) (Hansson, 2001, p. 57, citing McDonough 1991)

/j-ɨf-mas/	[jɨsmas]	‘I’m rolling along’
/ʃ-is-nà/	[sɨsná]	‘he carried me’
/si-dʒé:ʔ/	[ʃi-dʒé:ʔ]	‘they lie (slender stiff objects)’
/dz-ɨf-l-ta:l/	[dʒɨʃta:l]	‘I kick him [below the belt]’
/dz-ɨf-l-ts’in/	[dzɨʃts’in]	‘I hit him [below the belt]’

Samala (Chumash) has a similar process (Applegate, 1972). There are some wonderfully long words in Samala :

/ha-s-xintila-waf/	[haxintilawaf]	‘his former Indian name’
/k-su-kili-mekeken-f/	[kʃuk’ilimekeketʃ]	‘I straighten myself up’
/k-su-al-puj-un-faʃi/	[kʃalpujatʃiʃi]	‘I get myself wet’
/s-taja-nowon-waf/	[ʃtojowonowaf]	‘it stood upright’

The forms above are long-distance consonantal *assimilation*. Hansson (2001) and Rose and Walker (2004) provide a typological survey of consonantal harmony and find examples of nasal harmony, laryngeal harmony (e.g. voicing), stricture harmony, liquid harmony, coronal harmony and dorsal harmony.

There is also long-distance consonantal *dissimilation*. (Suzuki, 1998; Bennett, 2013). Recall the adjectival suffix allomorphs from Georgian (Aronson, 1982).

phizik-uri	‘physical’
kimi-uri	‘chemical’
akti-uri	‘active’
phrang-uli	‘French’
german-uli	‘German’
reakti-uli	‘reactive’
real-uri	‘real’
terminal-uri	‘terminal’

★ Let’s provide analyses with rewrite rules, autosegmental rules, and OT.

2 Vowel harmony

Vowel harmony is generally considered to be more common than consonantal harmony, and comprehensive typological studies and theories can be found in (Nevins, 2010; Walker, 2011). Harry van der Hulst also has a book on vowel harmony coming out soon.

Like other phonological patterns, vowel harmony can express itself as either a static fact about words in the language, or through phonological alternations and allomorphy.

The first example illustrates how in Degema, there are no words with both advanced ([i u e o ə]) and retracted ([ɪ ʊ ɛ ɔ a]) vowels. Every vowel in every word agrees in the feature Advanced Tongue Root (ATR). This is a phonotactic generalization.

ATR harmony in Degema (Archangeli and Pulleyblank, 2007, citing Elugbe 1984, Kari 1995, 1997)

Advanced		Retracted	
u-bí-ē	‘state of being black’	á-kī	‘pot’
u-pú-ēm	‘closing’	ʊ-fó-ā	‘state of being white’
u-dér-ēm	‘cooking’	ɔ-déǎ	‘chief’
i-sór-ē	‘passing liquid faeces’	ʊ-bóm-ām	‘beating’
o-gədəgó	‘mighty’	ɔ-kpakiraká	‘tough’

★ Let’s provide analyses with rewrite rules, autosegmental rules, and OT.

Next we consider vowel harmony in Hungarian which exhibits suffix allomorphy in the dative. The data below is from Hayes and Londe (2006, pp. 62-63).

[ɔblɔk-nɔk]	‘window-dat.’
[bi:ro:nɔk]	‘judge-dat’
[glyko:z-nɔk]	‘glucose-dat.’
[yʃt-nɛk]	‘cauldron-dat.’
[ʃofø:r-nɛk]	‘chauffeur-dat.’

★ What are the allomorphs and underlying forms?

★ In determining the allomorph, do the non-final vowels matter?

- ★ Based on the data so far, what are some issues in developing either an OT analysis or a rule-based analysis?

2.1 Neutral Vowels in Vowel Harmony

In some vowel harmony patterns, certain vowels are systematically excepted from the vowel harmony process. Such vowels are called *neutral* vowels. There are two types: *transparent* vowels and *opaque* vowels. Transparent vowels behave as if they are invisible to the harmony process; harmony appears to pass through them unaffected. On the other hand opaque vowels block the spread of harmony and begin their own harmony domain.

As an example of transparent vowels, consider the behavior of front unrounded vowels.

[fy:sɛ:r-nɛk]	‘spice-dat’
[ø:rɪzɛt-nɛk]	‘custody-dat.’
[pɔllɛ:r-nɔk]	‘bridge-dat.’
[hɔvɛr-nɔk]	‘pal-dat.’

What happens when all the vowels are front unrounded? They take front suffixes:

[kɛrt-nɛk]	‘garden-dat.’
[tsi:m-nɛk]	‘address-dat.’
[rɛpɛs-nɛk]	‘crack-dat.’

- ★ Based on the data so far, let’s sketch some analyses.

The generalizations above are good first approximations. There are enough interesting exceptions to the above generalizations, that much more sophisticated analyses have been given

Moving on to opaque vowels, I simply sketch the facts and analysis of Advanced Tongue Root (ATR) Vowel Harmony in Maasai as described by (Archangeli and Pulleyblank, 2007, 368-369). +/–ATR is a feature often used and is akin to the feature [tense]. Vowels [i,e,o,u...] are tense vowels and are also pronounced with the tongue root *advanced*, whereas vowels [ɪ,ɛ,ɔ,...] are lax and are pronounced with the tongue root *retracted*. Vowel [a] is [–ATR].

Instead of directional application (vowel harmony spreading left-to-right versus right-to-left), harmony in Maasai appears to be an instance of *stem control*. This means harmony generally propagates from the stem throughout the word in both directions, as seen below where /dot/ is the stem. The capital letters in the underlying forms indicate vowel specified for height and backness but *underspecified* for ATR.

/kI-dot-Un-IE/ [kidotupnie] ‘we shall pull it out with s.t.’

However, harmony is stopped by a low vowel encountered to the left of a harmonic trigger, such as the past tense suffix /tA/.

/kI-tA-dot-Un-IE/ [kitadotupnie] ‘we pulled it out with s.t.’

Harmony neither affects the low vowel nor does it skip it. But the low vowel does begin its own harmony domain since Thus [a] is an opaque vowel in Maasai.

- ★ What assumption do we have to make about how underspecified vowels surface if the ATE feature is not filled in?

2.2 Unattested Long-distance patterns

- ★ Describe some logically possible long-distance patterns which you wonder whether they are attested or not.

2.3 Theoretical Issues

1. To what extent can long-distance patterns in phonology be understood as “local”? See Gafos (1999); Ni Chiosain and Padgett (2001); Heinz (2010).
2. What principles make some long-distance patterns humanly available, but not others? See Gainor *et al.* (2012); Heinz and Lai (2013).
3. Are all long-distance patterns better characterized with stem/affix control or as directional? See (Baković, 2000; Krämer, 2003; Nevins, 2010) for different perspectives.
4. Most phonologists think that neutral vowels are not arbitrary. How can they be predicted? See discussion in (van der Hulst and van de Weijer, 1995).

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