

Vowel harmony in Romance varieties: representing minimal contrast

1. Introduction. Recently, the significance of contrast in phonology has received much attention (Flemming 1995, Lubowicz 2003, Padgett 1997). The present study advances this line of research by focusing on the role of *minimal contrast*. Minimally contrastive segments are pairs of segments that differ just along one dimension of contrast (Jakobson et al. 1952). Here, I present evidence for the importance of minimal contrast from vowel harmony patterns in the Romance dialects of Lena (Northwestern Spain) and Calvello (Southern Italy) (Dyck 1995). In these varieties, the presence of minimal height contrasts determines the application of vowel height harmony. In view of these facts, a new system to encode minimal contrast is proposed and framed within Optimality Theory (OT). Finally, an analysis of Lena harmony is developed incorporating the new representation of minimal contrast.

2. Vowel height harmony in Lena and Calvello. Evidence for the relevance of minimal contrast comes from vowel height harmony in Lena and Calvello. In these Romance varieties, post-tonic high vowels trigger raising of a stressed vowel. Interestingly, this harmony is triggered only by high vowels that minimally contrast for height. In Lena, only back vowels contrast for height, and the high back vowel is the only trigger. In Calvello, a height contrast is present only for front vowels, and harmony is triggered by the front high vowel. These patterns offer an instance of a phonological process sensitive to minimal contrast. Focusing on Lena, examples of the height harmony are shown in (1), where a high vowel causes raising of a preceding tonic one. In Lena, the trigger is always a word-final inflectional suffix. The inflectional inventory and its realization are given in (2, 3). This inflectional system is asymmetrical—only back vowels contrast for height. Production of the front vowel ranges from [i] to [e] but they lack a height contrast. Relevant here is that, even when a front vowel is realized as a high vowel, it never triggers harmony, as seen in (4). The generalization is that the only possible trigger is a high vowel that minimally contrasts for height.

3. Proposal: representation of minimal contrast. The facts from Lena (and Calvello) show that the application of height harmony depends on whether the trigger is minimally contrastive for height. Therefore, I argue that the phonological representation must include information about minimal contrast, which can be active or relevant for different phonological processes. I propose to formalize this contrast with a *contrast-coindexing* mechanism, which applies to minimally contrastive segments that are able to distinguish pairs of words. Minimal contrast is assessed at the word level, taking the whole system into consideration. Framed within OT, the *contrast-coindexing* function is argued to apply after GEN generates the candidates and before EVAL operates over them.

How does *contrast-coindexing* work? *Contrast-coindexing* compares any two candidate words and establishes whether they form a minimal pair. If so, the differing segments are evaluated for their dimensions of contrast. If they share all dimensions except for one, then they are *contrast-coindexed* for this dimension. Example (5) shows the *contrast-coindexing* representation for Lena vowel height and backness, through hypothetical monosyllabic words. Front vowels do not minimally contrast for height, as they do not differ from some other element only in height. Thus, they lack a *contrast-coindex* for this dimension.

4. Analysis of Lena. Walker (2005) argues that vowel height harmony takes place in order to improve perceptibility of a height feature in a perceptually weak position (cf. Revithiadou et al. 2005). I extend this approach to Lena by incorporating the *contrast-coindexing* proposal. Walker presents a schema for positional licensing constraints that require features in perceptually weak positions, e.g. an inflectional suffix, to be associated with a strong position, e.g. a stressed syllable. The observation that Lena harmony singles out [+high] when it is *contrast-coindexed* for height is incorporated in the licensing constraint in (6). This constraint targets only minimally contrastive [+high] in a weak inflectional position.

(1) Examples of Lena metaphony in the masculine singular forms (from Hualde 1989)¹.

<i>masc. sg.</i>	<i>fem. sg.</i>	<i>masc. pl.</i>	
[gétu	gáta	gátos	‘cat’
kordíru	kordéra	kordéros	‘lamb’
tsúbu	tsóba	tsóbos]	‘wolf’

(2) Lena inflectional inventory.

Front	Central	Back	
/e/		/u/	High
		/o/	Mid
	/a/		Low

(3) Realization of the Lena inflectional inventory.

Front	Central	Back	
[i/e]		[u]	High
		[o]	Mid
	[a]		Low

(4) Production of [i] in the inflectional suffix but lack of height harmony.

[matéstis] ‘you pl. killed’

(5) Lena inflectional vowel inventory with contrast-coindices for backness (b) and height (h).

pi_h/pe_b pu_{b/h}
 po_{b/h}
 pa_d

(6) LICENSE (Height features [+high]inflectional unstressed V_h, $\acute{\sigma}$)

Height features in a [+high] inflectional unstressed V_h must be licensed by a stressed vowel, where V_h stands for a vowel *contrast-coindexed* for height.

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¹ An accent mark over a vowel indicates stress.