Ordering Restrictions in Two Dialects of Aymara

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This talk provides an account of restrictions on the distribution of laryngeal features in Peruvian and Bolivian Aymara. The analysis argues both for modeling phonological patterning through the interaction of ranked, violable constraints, as in OT (Prince and Smolensky 2004), and for contrastively specified representations. While restrictions on representations are generally rejected in OT analyses, I demonstrate that contrastively specified outputs can be achieved through constraint ranking. Such contrastively specified representations serve as inputs to further evaluations in a stratal version of OT (e.g. Kiparsky 2000). Contrastive specifications are determined through hierarchical ordering of features (Dresher 2009). Unlike the previous analysis of MacEachern (1999), the analysis proposed here provides a formally unified account of both ordering and cooccurrence restrictions affecting laryngeal features.

Peruvian and Bolivian Aymara both have a three-way laryngeal contrast among stops with plain stops, aspirates and ejectives. In determining the representation of stops in Aymara, I adopt the theory of the contrastive hierarchy (Dresher 2009), according to which features are assigned hierarchically with some features taking scope over others. For any inventory, the highest ordered feature is contrastive for the entire set and lower ordered features continue to differentiate subsets until each segment is uniquely specified. In order to distinguish a set of three, two features are necessary. In the case of Aymara, I argue that the hierarchy of laryngeal features is [spread glottis] over [constricted glottis]. The contrastive feature specifications resulting from this order are given in (1), using the labial series as an example. There are no laryngeal contrasts among fricatives or sonorants in Aymara. Thus, if manner features are ordered above laryngeal features, the laryngeal features will only be contrastive for stops.

1.

p	p’	p^h
[-sg]	[-sg]	[+sg]
[-cg]	[+cg]	

The contrastive specifications given above can be achieved as the output of OT evaluations through ranking of contextual markedness and featural faithfulness constraints. Such contrastively specified outputs can then serve as the input to further evaluation, as in the following analysis of restrictions on laryngeally marked segments in Aymara.

Both varieties of Aymara are subject to restrictions on the cooccurrence and ordering of ejectives and aspirates. In Peruvian Aymara, ejectives and aspirates must be the leftmost stop in a form, although they may be preceded by sonorants and fricatives (2a). Multiple aspirates and ejectives are not permitted and aspirates and ejectives are also barred from occurring with one another (2b).

2a.	k’anta ‘wheel’	q^hatu ‘market’	sirk’u ‘nerve’	(from MacEachern 1999)
	*kant’a	*qat^{h}u	*pirk’u	
b.	*k’ant’a	*q^hat^{h}a	*k’ant^{h}a	

The Bolivian dialect has similar restrictions but the constraints on aspirates are less stringent than those of Peruvian Aymara. In Bolivian Aymara, multiple ejectives may not cooccur but multiple aspirates can (3a) as can combinations of aspirates and ejectives. Generally, when aspirates and ejectives cooccur, the ejective precedes the aspirate (3b). As in Peruvian Aymara, if a form contains only a single aspirate or ejective, it is the leftmost stop.

3a. p^hut^hu ‘hole, hollow’ b. tʃ’ip^{h}a ‘leather net’

The pattern of cooccurrence and ordering restrictions is analyzed using markedness constraints such as *[αsg] [+sg]. This constraint restricts the distribution of marked features. Violations are incurred if the marked feature [+sg] follows a segment specified for any value of [sg]. Aspirates preceded by aspirates, specified as [+sg], and aspirates preceded by plain stops, specified as [-sg], will violate the constraint. Preceding sonorants and fricatives will not lead to a violation of the constraint, as they are not contrastively specified for any value of [sg].

Differences between Peruvian and Bolivian Aymara can be captured with simple constraint reranking. *[αsg] [+sg] must be ranked below input-output faithfulness constraints referring to [sg] in Bolivian Aymara while it is ranked above such constraints in Peruvian Aymara. The analogous markedness constraint restricting the distribution of ejectives, *[αcg][+cg], is ranked above relevant faithfulness constraints in both dialects.

Additional constraints are needed in order to capture the relative order of aspirates and ejectives in Bolivian Aymara forms containing both. In the general case, ejectives precede aspirates. However, if the initial stop is a labial, the order of laryngeal features is reversed with the aspirate preceding the ejective as shown in (4).

4. p^hant'a 'black coat' p^hit∫'i 'coat pin'

This is a case of emergence of the unmarked. Ejective labials are permitted in general but are avoided in just those cases where aspirates and ejectives cooccur. In analyzing the interaction of place and laryngeal features in Bolivian Aymara, I follow MacEachern (1999) who argues that ejective labials are articulatorily difficult and typologically marked, thereby motivating use of the markedness constraint *p'. While the existence of *p' is well-motivated, determining its place in the constraint hierarchy leads to an apparent ranking paradox. As shown in (5), *p' must be ranked high enough to reverse the typical ejective-before-aspirate order in forms with initial labials (5a), yet must be ranked low enough to allow initial ejective labials to surface in forms containing only a single laryngeally-marked segment (5b).

5a. p^hant'a 'black coat' *p'ant^{h}a
b. p'aka *pak'a

The data in (5) can be accounted for by crucially relying on the contrastive representations in (1). In the theory of the contrastive hierarchy, if a set of three segments must be distinguished, the results will necessarily be asymmetric with the highest ordered feature being contrastive for all three segments and the lower ordered feature being contrastive for only two. In the representations in (1), although the plain stop is contrastively specified as [-cg], the aspirate is not. The sequence of stops in the permitted form *p^hant'a* therefore satisfies the markedness constraint *[αcg][+cg] which is violated by the barred form **pak'a*. If the markedness constraint *p' is ranked below *[αcg][+cg], labial ejectives will surface faithfully in forms without aspirates but will be avoided in forms containing combinations of aspirates and ejectives. An additional constraint, *[αsg] [+cg] is needed to ensure the default order of ejectives before aspirates in forms which do not contain initial labials. In this analysis, constraint interaction is able to capture the complex interaction of place features and laryngeal features only in combination with contrastively specified representations.

References ● Dresher, Elan. 2009. *The Contrastive Hierarchy in Phonology*. Cambridge: Cambridge University Press. ● Kiparsky, Paul. 2000. Opacity and cyclicity. *The Linguistic Review* 17: 351-365. ● McCarthy, John and Alan Prince. 1994. The Emergence of the Unmarked: Optimality in Prosodic Morphology. *NELS* 24: 333-379 ● MacEachern, Margaret. 1999. *Laryngeal Cooccurrence Restrictions*. Garland. ● Prince, Alan and Paul Smolensky. 2004. *Optimality Theory: Constraint Interaction in Generative Grammar*. Oxford: Basil Blackwell.