Partial identity preference in Oromo co-occurrence restrictions

Avery Ozburn, University of British Columbia

Even though fully identical segments are often exempt from OCP constraints, it has been suggested that partial identity between segments is never treated preferentially in co-occurrence restrictions (Gallagher and Coon 2009). In fact, in many cases of OCP restrictions, partial agreement is dispreferred compared to disagreement. For example, in Arabic, homorganic segments rarely co-occur, but when they do, those that are less featurally similar (e.g. coronals [s] and [d] that disagree in manner) are more likely to co-occur compared to those that share more features (e.g. coronals [t] and [d] that agree in manner) (Frisch et al. 2004). It has thus been suggested that, to the extent that similarity is relevant to dissimilatory co-occurrence restrictions, there is a distinction between total and partial identity: while some languages exempt total identity from such restrictions, no languages exempt partial identity, and some disprefer it.

This study reports on a case of consonant co-occurrence restrictions in Oromo (Cushitic; Ethiopia) for which this generalization does not hold. Oromo has stops/affricates at four places of articulation and contrasts in the laryngeal features [constricted glottis] and [voice]. At the velar and post-alveolar places, there is an ejective ([+cg, -voice]), a plain voiceless stop ([-cg, -voice]), and a voiced stop ([-cg, +voice]); the coronal place also has an implosive, while the bilabial place lacks the plain voiceless stop (Gamta 1989). Based on an analysis of an Eastern Oromo dictionary (Abd and Youssouf, in progress) using the software Phonological CorpusTools (Hall et al. 2015), a very strong tendency emerges for pairs of co-occurring stops that share a place of articulation to also share all laryngeal features. Indeed, while words with two identical stops, like hypothetical *t'at'a* and *tata*, are quite common in Oromo, words with homorganic stops that disagree in laryngeal features, like hypothetical *tat'a*, are quite rare. This basic pattern seems like a typical case of an OCP-place restriction with an exemption for total identity.

However, an unexpected trend appears within the exceptions to this pattern: in Oromo, unlike in languages like Arabic, homorganic stops/affricates are less likely to co-occur when they are less featurally similar. There is near-categorical absence of co-occurrences of homorganic stops/affricates where one is ejective and the other is voiced, like hypothetical *k'aga*, with only a single exception in the dictionary (Observed/Expected=0.01).[1] In contrast, there are many more examples of homorganic ejective/plain and voiced/plain co-occurrences, like hypothetical *k'aka* and *gaka*; such forms are still highly under-represented compared to total identity (O/E=0.19, 0.29 respectively), but far better represented than ejective/voiced pairs. This result is precisely the opposite of the prediction made by previous accounts of the role of similarity in OCP effects. Indeed, regardless of how similarity is computed, ejective/plain and voiced/plain pairs, where the consonants differ only in [constricted glottis] or [voice] respectively, are more similar than ejective/voiced pairs, where the consonants differ in both [constricted glottis] and [voice] and therefore share a subset of the features shared by ejective/plain and voiced/plain pairs. Thus, Oromo shows a gradient effect in which pairs of homorganic stops/affricates that disagree in multiple laryngeal features are more dispreferred than pairs disagreeing in only one. Crucially, this effect is the opposite of what is typically seen in OCP patterns (e.g. Frisch et al. 2004).

Given these new data from Oromo, I argue for the need to refer to partial identity in phonological accounts of co-occurrence restrictions. I propose an approach to Oromo that modifies Gallagher and Coon's (2009) Optimality Theoretic account of co-occurrence restrictions in Chol. In order to require homorganic stops/affricates to be in a formal linking

[1] Interestingly, the exception is with stops at the bilabial place of articulation, with a co-occurrence of [b] and [p']. This exception could therefore relate to the lack of a plain bilabial stop [p] (see e.g. Mackenzie 2009).

relationship, to which agreement constraints refer, I adopt Gallagher and Coon's similarity-sensitive LINK-CC constraint (cf. the CORR-CC constraints of Rose and Walker 2004). However, I reinterpret their IDENTITY constraint, which for Gallagher and Coon (2009) requires total identity between linked consonants, as a weighted constraint that is sensitive to the similarity of linked consonants. Specifically, I propose that in Oromo, the weight of the IDENTITY constraint is inversely correlated with the similarity of the linked segments, so that more similar segments cause less of a violation. In this way, rather than penalizing all cases of non-total identity between linked consonants equally, this revised constraint prefers partial identity to dissimilarity. I demonstrate that this analysis is more effective at accounting for the Oromo patterns than existing theories, because it can capture the ways in which Oromo consonant co-occurrence restrictions are sensitive to both total and partial identity. The LINK-CC constraint accounts for the fact that these restrictions appear in consonants similar in place, while the weight of IDENTITY captures the preference for laryngeal similarity among homorganic consonants. Thus, this approach accounts for the partial similarity effects in Oromo, while maintaining both the special status of total identity and the similarity-sensitive LINK-CC constraints that allow Gallagher and Coon (2009) to capture the fact that some languages disprefer partial similarity.

Finally, I show how allowing for partial identity within a framework that prefers total identity better accounts for the cross-linguistic typology of laryngeal co-occurrence restrictions. Specifically, I compare this approach to ones in which all long-distance assimilations that are not articulatory spreading are requirements for total identity (e.g. Gallagher and Coon 2009) and those in which total identity has no special status, but instead is comprised of partial identity (e.g. Rose and Walker 2004). By adding IDENT-IO[place] and IDENT-IO[manner] constraints to the proposed IDENTITY constraint that prefers partial identity to no identity, this account can be extended to languages that require heterorganic consonants to agree in laryngeal features, even though such agreement does not create total identity. Unlike in Gallagher and Coon (2009), partial identity in this approach does not require articulatory spreading, which is problematic for laryngeal harmony that does not appear to affect intervening vowels. Furthermore, while it still captures attested laryngeal patterns, this account is unlike Rose and Walker (2004) in that it gives special status to total identity, as is motivated by the cross-linguistic typology. Thus, I propose that building a partial similarity preference into a total identity system is not only necessary for Oromo, but also creates a better motivated account of other laryngeal co-occurrence systems.

References:

Abd, Taha and Tamam Youssouf. In progress. *Furjecha Afaan Oromo*. Unpublished manuscript.

Frisch, Stefan. A., Janet B. Pierrehumbert, and Michael B. Broe. 2004. Similarity avoidance and the OCP. *Natural Language & Linguistic Theory,* 22(1), 179-228.

Gallagher, Gillian, and Jessica Coon. 2009. Distinguishing total and partial identity: Evidence from Chol. *Natural Language & Linguistic Theory,* 27(3), 545-582.

Gamta, Tilahun. 1989. Oromo-English Dictionary. AAU Printing Press.

Hall, Kathleen Currie, Blake Allen, Michael Fry, Scott Mackie, and Michael McAuliffe. 2015. Phonological CorpusTools, Version 1.0.1. [Computer program]. Available from https://sourceforge.net/projects/phonologicalcorpustools/.

Mackenzie, Sara. 2009. *Contrast and similarity in consonant harmony processes*. PhD Dissertation, University of Toronto.

Rose, Sharon, and Rachel Walker. 2004. A typology of consonant agreement as correspondence. *Language* 80: 475–531.