Retroflex harmony in Kalasha: Agreement or spreading?

Previously identified cases of retroflex consonant harmony involve either stops or sibilants (affricates and/or fricatives). In Malto (Dravidian), for example, coronal stops within a root have to be either retroflex or dental (1a). In Gimira (Afro-Asiatic), posterior sibilant affricates and/or fricatives within a root or a word have to be either retroflex or palato-alveolar (1b). Both types of retroflex harmony can be, in principle, accounted for by current theories of consonants harmony: as local feature spreading (Gafos 1999) or as long-distance agreement by correspondence (ABC; Hansson 2001; Rose & Walker 2004). The two theories, however, make different predictions about harmony in languages that have both types of contrasts – retroflex/nonretroflex stops and retroflex/nonretroflex sibilant affricates or fricatives. The ABC approach relies crucially on featural similarity of participating segments. It, therefore, predicts that same-manner consonants (both stops, both fricatives, etc.) are more likely to harmonize than different-manner consonants (a stop and a fricative, etc.). The Spreading approach does not encode similarity, and, consequently, does not predict similarity effects, as all segments contrastive for the relevant feature – stops, fricatives, and affricates – are expected to agree. Until now, however, these predictions have not been tested, largely due to the fact that languages with two- or three-way retroflex contrasts are typologically rare (Maddieson 1984) and relatively under-studied.

In this paper we present new data that have an important bearing on the theoretical debate on mechanisms of retroflex harmony. Kalasha (Dardic, Indo-Aryan) has retroflex stops, affricates, and fricatives, which are contrastive with dental/alveolar stops, fricatives, and affricates, as well as with post-alveolar fricatives and affricates (2). To examine whether Kalasha shows any restrictions on co-occurrence of retroflexes and nonretroflexes, we compiled a corpus of roots with relevant consonants, based on the dictionary by Trail & Cooper (1999). The current corpus consists of over 130 phonologically non-identical #CVC root sequences (and is being currently extended to other roots with coronal obstruents). For each consonant class combination, we have computed ratios of observed and expected occurrences (assuming random distribution) and subjected these to a statistical analysis (cf. Frisch et al. 2004). The results revealed strong harmonic effects in Kalasha roots mediated by relative similarity of participating consonants. First, combinations of two stops, two fricatives, and two affricates that agree in retroflexion are statistically over-represented, while the same kinds of combinations that disagree in retroflexion are categorically absent. This is indicative of retroflex harmony which consistently applies in roots with same-manner coronal obstruents (3a). Second, combinations of fricatives and affricates are partly under-represented: while retroflex fricatives co-occur with nonretroflex affricates, combinations of retroflex affricates with nonretroflex fricatives are not attested. Thus, the harmony applies only partially in roots with different-manner sibilants (3b). Third, combinations of stops with fricatives or affricates of the same or different place are commonly found, and are neither under-represented, nor over-represented. The harmony, therefore, does not apply at all to roots with combinations that disagree in stridency (3c).

In sum, the results show that Kalasha roots exhibit retroflex harmony, which is highly sensitive to relative similarity of non-adjacent consonants. It applies consistently if both consonants agree in [±cont, ±strid]; it applies partially if the consonants agree in [±strid] but not [±cont]; it does not apply if the consonants agree in [±cont] but not in [±strid], or if they disagree in both features. The data, therefore, are compatible with the ABC approach which encodes featural similarity, and are problematic for the Spreading approach (unless the former is modified to incorporate the notion of similarity). In the remainder of the paper, we present an ABC analysis of Kalasha retroflex harmony. The crucial component of this analysis is a hierarchy of C↔C Correspondence constraints that are based on a scale of (weighted) similarity of coronal obstruents (4), combined with the constraint IDENT-CC([±dist]) enforcing correspondence between pairs of consonants in retroflexion (cf. Rose & Walker 2004; Hansson 2001). We finally discuss implications of this analysis for the typology of consonant harmony in languages with coronal contrasts of different complexity.

(1) a. Retroflex harmony in Malto (Mahapatra 1979; Hansson 2001)

ʈuːɖ ‘tiger’ dudu ‘mother’ ɖanɖa ‘staff’ toːtotri ‘quickly’

*ʈ...t, * d...ɖ, etc.

b. Retroflex harmony in Gimira (Breeze 1990; Rose & Walker 2004) (tones omitted)

ʂaʂ ‘vein’ ʃatʃ ‘stretcher’ ʈʂ’utʂ’ ‘louse’ ʧ’aʃt ‘be pierced’

*ʂ…ʃ , *ʧ…ʈʂ, *ʂ…ʧ, etc.

(2) Coronal obstruent contrasts in Kalasha (based on Bashir 2003)

	dental/alveolar	*retroflex*	*palato-alveolar*
stop	t tʰ d dʱ	ʈ ʈʰ ɖ ɖʱ	--
affricate	ts tsʰ ʤ	ʈʂ ʈʂʰ ɖʐ	ʧ ʧʰ ʤ ʤʱ
fricative	s z	ʂ ʐ	ʃ ʒ

(3) Attested and unattested (shaded) combinations with retroflexes in Kalasha CVC roots

		retroflex/retroflex	*retroflex/nonretroflex*
a.	stop/stop	ʈaʈ-, ɖuɖ-, etc.	*ʈVt-, *dVɖ-, etc.
	affricate/affricate	ʈʂutʂʰ-, ɖʐaʈʂ-, etc.	*ʈʂVʧ-, *ʤVɖʐ-, etc.
	fricative/fricative	ʂiʂ-, ʂuʂ-, etc.	*ʂVs-, *ʐVʒ-, etc.
b.	fricative/affricate(ret)	ʈʂaʂ-, etc.	*ʈʂVs-, *ɖʐVʒ-, etc.
	fricative(ret)/affricate		ʂatʃ-, ʤeʂ-, etc.
c.	stop/fricative	ɖʱus-, ʂuʈ-, etc.	ʈos-, ʐot-, etc.
	stop/affricate	ɖuʈʂ-, etc.	ʈõʧ-, tsaʈ-, etc.

(4) Similarity-based correspondence hierarchy for [±distributed] in coronal obstruents

CORR-C↔C	»	CORR-C↔C	»	CORR-C↔C	»	CORR-C↔C
[αcont, αstrid, αdist]		[αstrid, αcont]		[αstrid]		[αcont]
identical		*same manner*		*same stridency*		*same continuancy*

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