When is derived [i] transparent? A subtractive approach to Uyghur vowel harmony

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It has often been observed that some phonological patterns refer to contrastive features but ignore redundant ones. Theories of representations have responded to this observation in two kinds of ways: either by positing that redundant features are unavailable to some or all of the phonological computation (e.g., Archangeli 1988; Dresher 2009; Mackenzie 2013), or by positing that both kinds of features are phonologically visible, but that the computation is able to distinguish between them (e.g., Calabrese 1995; Halle et al. 2000; Nevins 2010). In other words, the special status of contrastive features can be encoded either by subtracting information from phonological representations (excluding redundant features), or by adding information (marking specifications as contrastive or redundant).

This paper argues for a subtractive approach to contrast, taking as its empirical focus the vowel harmony system of Uyghur (a Turkic language spoken in Central Asia). Halle et al. (2000) and Vaux (2000) present an additive account of Uyghur vowel harmony that is striking because it requires that the contrastive or redundant status of a feature be reassessed during the course of the derivation. We show that a subtractive approach to contrast offers an elegant and principled account of the Uyghur facts that eliminates this need to reevaluate contrastiveness.

Harmony and derived transparency Uyghur has the vowel inventory shown in (1). The vowels /i/ and /e/, which have no minimally different back counterparts, are transparent to vowel place harmony. Harmony propagates from left to right, producing alternations in suffixes as in (2) and (3).

(1)

	FRONT		BACK	
	UNRND	ROUND	UNRND	ROUND
HIGH	i	y		u
MID	e	ø		o
LOW	æ		ɑ	

(2)
a. jyz-lær 'face'+PL.
b. køl-lær 'lake'+PL.
c. xæt-lær 'letter'+PL.

(3)
a. pul-lɑr 'money'+PL.
b. jol-lɑr 'road'+PL.
c. ɑt-lɑr 'horse'+PL.

The transparency of /i/ is illustrated in (4) and (5).

(4)
a. jyz-imiz-gæ 'face'+'our'+DAT.
b. køl-imiz-gæ 'lake'+'our'+DAT.

(5)
a. pul-imiz-ʁɑ 'money'+'our'+DAT.
b. jol-imiz-ʁɑ 'road'+'our'+DAT.

There are also non-alternating suffixes such as diminutive/approximative/similative -tʃæ, which not only remains front after back stems, but can also transmit frontness to a subsequent suffix:

(6)
a. næj-tʃæ-m-dæ 'in my little flute' ('flute'+tʃæ+1SG.POSS.+LOCATIVE)
b. kitɑp-tʃæ-m-dæ 'in my booklet' ('book'+tʃæ+1SG.POSS.+LOCATIVE)

Low vowels in medial open syllables raise to [i], as in (7). When this applies to -tʃæ, it becomes transparent to harmony; compare (8b) with (6b).

(7)
a. bɑlɑ 'child' bɑli-lɑr 'children'
b. iʃæk 'donkey' iʃiɣ-i 'donkey'+POSS.

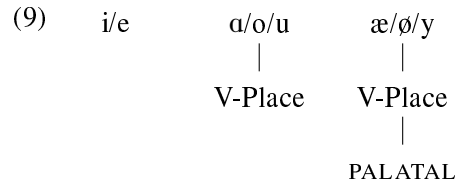(8)
a. næj-tʃi-dæ 'child'+tʃæ+LOC.
b. kitɑp-tʃi-dɑ 'book'+tʃæ+LOC.

The additive account In Halle et al.'s (2000) and Vaux's (2000) account, all features are specified, but harmony spreads, and can be blocked by, only contrastive values of [±back]. In this additive approach, then, the transparency of an [i] derived from /æ/ means that its [−back] specification must become non-contrastive as soon as it becomes high. It is not possible for a given feature specification to be identified as contrastive or redundant once and for all; rather, its status must continually be reassessed based on the marking statements that define the inventory (Calabrese 1995).

The subtractive account In a subtractive approach to contrast, /i/ and /e/ are transparent to harmony because they are simply unspecified for the harmonizing feature. The transparency of derived [i] in (8b) potentially presents a challenge for this approach as well: Halle et al. (2000: 397–8) argue that it "requires postulation of an ad hoc rule" to delete the place specification of the underlying /æ/. But such deletion is

empirically justified by the fact that raising neutralizes the underlying place contrast between /æ/ and /ɑ/ as in (7), as pointed out by D'Arcy (2004). Raising is reduction, both in the acoustic sense that it reduces sonority, and in the formal sense that it eliminates marked structure, in this case place specifications.

A contrastively underspecified set of representations for place features for Uyghur vowels is shown in (9). Neutral /i/ and /e/ have no place specification; non-neutral vowels have a V-Place node, and within this category front vowels are distinguished by PALATAL. (Front is taken to be the marked place value because roots with only neutral vowels most often take back suffixes.) Alternating suffixes underlyingly have back vowels; harmony spreads PALATAL rightward to vowels with V-Place nodes, ignoring unspecified /i e/. Non-alternating -ʧæ, underlyingly specified with a front vowel, thus does not become back after back stems, and can transmit its frontness to subsequent suffixes. Raising, however, deletes its place specification and makes it transparent.

(9)
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i/e        ɑ/o/u        æ/ø/y
             |             |
          V-Place      V-Place
                          |
                       PALATAL
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Raising without transparency   Halle et al. (2000: 399) predict that, because the contrastive status of features is calculated with reference to the inventory rather than encoded in the representations, any process that makes an underlying harmonic vowel phonetically identical to a transparent vowel (such as raising /æ/ to [i]) must also make it transparent. But even within Uyghur, there is reason to doubt this prediction. (10) and (11) illustrate raising in disharmonic roots. When the raised vowel is /ɑ/, as in (10), it is transparent as expected. But if the raised vowel is /æ/, as in (11), suffixes surface with front vowels.

(10) a. æswɑp   'tool'   (11) a. ɑdæm   'man'

　　　 b. æswib-i-ɣæ   'tool'+3SG.POSS+DAT.   b. ɑdim-i-ɣæ   'man'+3SG.POSS.+DAT.

　　　 c. qæhwɑ   'coffee'   c. ɑʁinæ   'friend'

　　　 d. qæhwi-ɣæ   'coffee'+DAT.   d. ɑʁini-lær   'friend'+PL.

Vaux (2000) derives this pattern through rule ordering, with cyclic harmony preceding raising but post-cyclic harmony following it. The representations in (9), however, allow for a more elegant account that does not need to posit that the apparent non-transparency of derived [i] in (11) is illusory. Instead, the preservation of frontness in (11) can be attributed to root faithfulness (Beckman 1998: ch. 4); if a PALATAL feature from a root can be retained by associating to a suffix vowel when its original host is raised, it will be, whereas suffixal PALATAL is simply deleted on raising. The transparency of raised root /ɑ/ in (10) follows from the representations: there is no marked backness feature to preserve.

Conclusion   Representations in which only contrastive features are specified can account for the Uyghur patterns, and do so without requiring the phonological computation to refer to marking statements to determine which features are visible. In the larger picture, there is also a methodological reason to prefer the subtractive approach over the additive one: giving the phonology less information to work with restricts what it can do, and so the subtractive approach is more easily falsifiable than the additive one. The additive approach should be a fallback position, and Uyghur vowel harmony presents no reason to fall back.

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