Uyghur disharmony without diacritics (or, phonological representations are phonological)

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2024 LSA Annual Meeting • New York City • January 4–7

Like many other Turkic languages, Uyghur exhibits vowel harmony with respect to a [front/back] feature. In (1), the causative suffix has a [y] after a stem with front vowels and a [u] after a stem with back vowels.

(1) a. tʃæk-tyr 'smoke-CAUS' (*-tur) b. bɑk-tur 'raise-CAUS' (*-tyr)

All vowels participate in this harmony except for /i/ and /e/, which are neutral (2).

(2) a. ymid-lær 'hope-PL' (*-lɑr) b. amil-ʁɑ 'element-DAT' (*-gæ)

When the only vowels in a stem are /i, e/, some co-occur with front suffixes (3a, b), and others occur with back suffixes (3c, d). This has led some (Lindblad 1990; Hahn 1991*a*,*b*) to posit that surface [i] (and for some, also [e]) is the realization of two different underlying vowels, front /i/ and back /ɨ/ or /ɯ/ (and similarly, /e/ and /ɤ/). The posited abstract underlying vowels fill a gap in the Uyghur vowel system (4).

(3) a. bilim-gæ 'knowledge-DAT' (*-ʁɑ) c. sinip-qɑ 'classroom-DAT' (*-kæ)
b. tʃekin-dyr 'retreat-CAUS' (*-dur) d. siʁiʃ-dur 'contain-CAUS' (*-dyr)

(4) Uyghur vowel inventory

	unround		round	
	front	back	front	back
high	i		y	u
mid	e		ø	o
low	æ	ɑ		

Mayer, Major, & Yakup (2022) observe that a similar analysis is provided for Inuit by Compton & Dresher (2011), who propose that in some Inuit dialects there is evidence in favour of a covert contrast between /i/ and /ə/ which is neutralized on the surface to [i]. Mayer, Major, & Yakup (2022) reject this sort of analysis in general, questioning Compton & Dresher's (2011) use of covert contrast:

> This is an instance of what Kiparsky (1973) called "the diacritic use of phonological features" (p. 16): an underlying featural contrast is used to condition phonological behavior, *despite corresponding to no observable phonetic differences in the conditioning segments themselves* … [emphasis added]

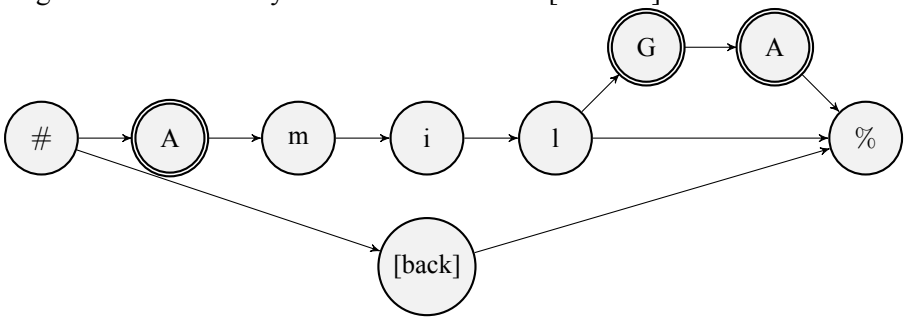
Requiring 'observable phonetic differences in the conditioning segments' amounts to the *linearity* and *invariance* conditions, rejected by Chomsky (1964) as too strong. However, Mayer, Major, & Yakup's (2022) alternative, *diacritic exception features* (Chomsky & Halle 1968; Zonneveld 1978; etc.), still require linking rules to connect them to phonetic observables. The issue here is the proliferation of arbitrary,

non-phonological information in the phonology. As Buckley (1994: 18) says, the diacritic 'is arbitrary, unconstrained, and makes no predictions about the behavior of the morpheme beyond that rule'.

We argue here that an abstract vowel analysis is indeed wrong for Uyghur, not because there is a general problem with abstract underlying vowels, but because Uyghur is crucially different from Inuit. In Inuit the evidence for two vowels underlying [i] is strongly localized: some [i] trigger palatalization in a following consonant and other [i] do not. Thus, the palatalizing feature must be present in some [i] but not in others, suggesting two distinct sources of surface [i]. The same is not the case in Uyghur. First, the evidence from regular harmony, as in (1) and (2), does not point unequivocally to underlying back /ɨ/ or /ʏ/, but could indicate, as suggested above, that /i/ and /e/ simply do not participate in vowel harmony. While examples like (3) could at first be interpreted as implying underlying back counterparts to /i/ and /e/, a wider consideration of the evidence is not consistent with this analysis.

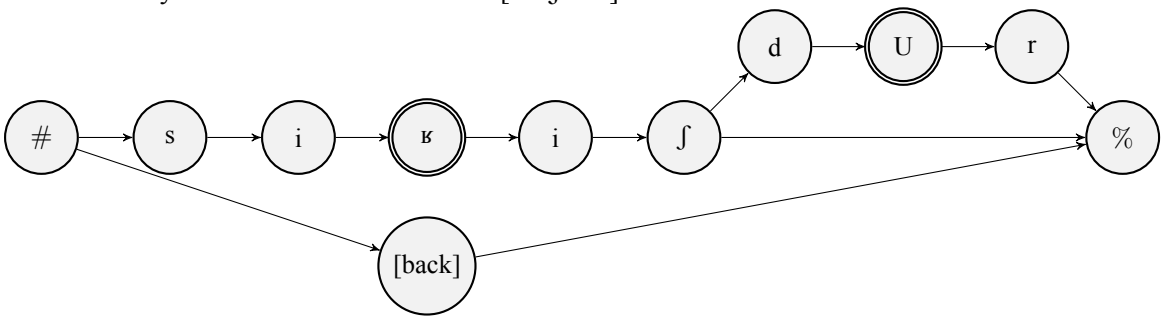
Rather, we consider here the consequences of an updated autosegmental (Goldsmith 1976) analysis of Uyghur harmony (Hall & Ozburn 2019), using a formalization (Raimy 2000; Papillon 2020; Idsardi 2022) in terms of phonological *events*, *features*, and *precedence*. Instead of association lines, two events which are in parallel can be pronounced in tandem. Given [front/back] in a separate stream (Bregman 1990), a harmonic form such as [ɑmil-ʁɑ] (2b) can be represented as in (5). The feature [back] is associated with the entire stem /ɑmil/ and spreads to the suffix /-GA/. Nodes with a double circle indicate segments, here [ɑ] and [ʁ], that receive a [back] specification (upper case letters represent segments not yet specified for [back]). The vowel /i/ is not specified for [back] in the phonology.

(5) Regular vowel harmony with a neutral vowel: [ɑmil-ʁɑ]



A neutral-vowel form such as [siʁiʃ-dur] (3d) can be represented in similar fashion (6): in this word, the presence of [back] in the stem is shown by the [back] [ʁ]. In other stems, such as (3c), the presence of the floating [back] is revealed only when a suffix is attached.

(6) Back harmony with a neutral vowel stem: [siʁiʃ-dur]

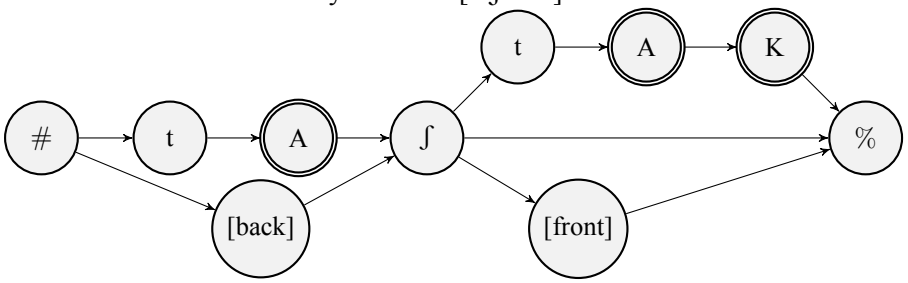


Examples of overt disharmony between stem and suffix further show the autosegmental nature of the feature [front/back]. Indeed, Mayer, Major, & Yakup (2022) and Mayer, McCollum, & Eziz (2022) note that there are several types of cases (7). These include: disharmony with /k/ and /q/ (which should take [lær] and [lɑr], respectively) (7a, b); disharmony with non-neutral vowels, e.g. /ɑ/ (7c); variable behavior (7d); and imposition of [front] from the neutral vowel suffix *-diki* (7e).

(7)	a.	etnik-lar	ethnic groups-PL	with → [back]
	b.	tætqiq-lær	'research-PL'	with → [front]
	c.	tɑʃ-tæk	'stone-like'	with → [front]; see (8)
	d.	sowet-lær/lɑr	'Soviet-PL'	variable
	e.	rɑjon-lɑr-diki-gæ	'Soviet-PL-LOC-DAT'	with → [front] on *-diki*

We can diagram (7c) as in (8).

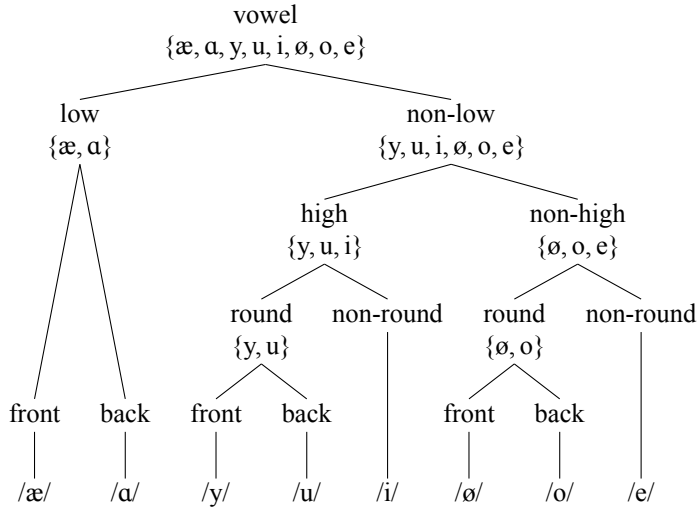
(8) Disharmonic vowel harmony with /ɑ/: [tɑʃ-tæk]



To learn such representations, the learner simply needs to parse (8) into its constituent parts, recognizing the suffix *-tæk*, and then inferring that the rest of the graph constitutes the stem. In consequence, stems like /tɑʃ/ are 'post-fronting', specifying that subsequent suffixes will be [front], akin to tone-donating morphemes (Kidima 1991), post-accenting stems in Russian (Stang 1957), and the converse, pre-stressing suffixes in Uyghur (Hahn 1991*a*) and Turkish (Kaisse 1986). That is, in disharmonic stems a 'floating' autosegmental event (here [front]) follows the segmental material of the stem. There is nothing abstract about the feature [front], which was observed in the speech signal. The autosegmental analysis that is able to represent 'post-fronting' or 'post-backing' phonologically as a kind of morpheme-level feature (Lightner 1965; Vaux 2000) thus predicts that 'exceptional' suffixal disharmony could expand to other cases, as attested in (7).

We do not think that it is a coincidence that the neutral vowels /i/ and /e/ are the only vowels that lack a [back] counterpart. If we generate contrastive features hierarchically, we find that there are many feature orderings in which /i/ and /e/ do not receive a specification for [front/back]. An example is (9).

(9) An Uyghur vowel feature hierarchy: [low] ≫[high] ≫ [round] ≫ [front/back]



The representations generated by the tree in (9) differ in various details from those proposed by Hall & Ozburn (2019), but what is most relevant here is that they, too, leave /i/ and /e/ unspecified for the harmonizing feature. The fact that these vowels lack back counterparts does not make it inevitable that they will be unspecified for [front/back]; for example, if [front/back] were ordered first, then every vowel would fall

under its scope, and /i/ and /e/ would be specified [front]. For the four features [low], [high], [round], and [front/back], there are 24 different orderings, in which 14 specify /i/ and /e/ as [front] (many of these orders, however, assign dubious representations to other segments). But there are *no* orders of conventional features that would make any other vowel unspecified (i.e. neutral) with respect to [front/back].

In conclusion, our analysis reveals that concern about abstract phonemes in Uyghur such as */ɯ/ is misplaced. The same learning theory that leads a learner to posit abstract /ə/ in Inuit leads a learner to posit a morpheme-level [front/back] feature in Uyghur. Rather, our question is about features versus diacritics. To all appearances, Uyghur harmony and disharmony are phonological. Lacking evidence to the contrary, we maintain that phonological representations are phonological.

References

Bregman, Albert S. 1990. *Auditory scene analysis: The perceptual organization of sound*. Cambridge, MA: MIT Press.

Buckley, Eugene. 1994. Default feature prespecification: The two [i]'s of Kashaya. In *North East Linguistics Society*, vol. 24 (1), Article 3. URL `https://scholarworks.umass.edu/nels/vol24/iss1/3`.

Chomsky, Noam. 1964. *Current issues in linguistic theory*. The Hague: Mouton.

Chomsky, Noam and Morris Halle. 1968. *The sound pattern of English*. New York: Harper and Row.

Compton, Richard and B. Elan Dresher. 2011. Palatalization and 'strong *i*' across Inuit dialects. *Canadian Journal of Linguistics/Revue canadienne de linguistique* 56(2): 203–228.

Goldsmith, John A. 1976. *Autosegmental phonology*. Ph.D. thesis, MIT, Cambridge, MA. Published 1979. New York: Garland.

Hahn, Reinhard F. 1991*a*. Diachronic aspects of regular disharmony in Modern Uyghur. In William G. Boltz and Michael C. Shapiro (eds.), *Studies in the historical phonology of Asian languages*, 68–101. Amsterdam: John Benjamins Publishing Company.

Hahn, Reinhard F. 1991*b*. *Spoken Uyghur.* Seattle, WA: University of Washington Press.

Hall, Daniel Currie and Avery Ozburn. 2019. When is derived [i] transparent? A subtractive approach to Uyghur vowel harmony. In Maggie Baird and Jonathan Pesetsky (eds.), *NELS 49: Proceedings of the 49th Meeting of the North East Linguistic Society*, vol. 2, 89–102. Amherst, MA: GLSA.

Idsardi, William J. 2022. Underspecification in time. *Canadian Journal of Linguistics/Revue canadienne de linguistique* 67(4): 670—682.

Kaisse, Ellen. 1986. Toward a lexical phonology of Turkish. In Michael Brame, Heles Contreras, and Frederick J. Newmeyer (eds.), *A festschrift for Sol Saporta*, 231–239. Seattle, WA: Noit Amrofer.

Kidima, Lukowa. 1991. *Tone and accent in Kiyaka*. Ph.D. thesis, UCLA.

Kiparsky, Paul. 1973. Phonological representations. In Osamu Fujimura (ed.), *Three dimensions of linguistic theory*, 3–136. Tokyo: Taikusha.

Lightner, Theodore M. 1965. On the description of vowel and consonant harmony. *Word* 21(2): 244–250.

Lindblad, Vern M. 1990. *Neutralization in Uyghur*. Master's thesis, University of Washington, Seattle, WA.

Mayer, Connor, Travis Major, and Mahire Yakup. 2022. Are neutral roots in Uyghur really neutral? Evaluating a covert phonemic contrast. In *Proceedings of the 2021 Annual Meeting on Phonology (AMP 2021)*, 1–12. doi: https://doi.org/10.3765/amp.v9i0.5174.

Mayer, Connor, Adam McCollum, and Gülnar Eziz. 2022. Issues in Uyghur phonology. *Language & Linguistics Compass* e12478. URL `https://doi.org/10.1111/lnc3.12478`.

Papillon, Maxime. 2020. *Precedence and the lack thereof: Precedence-relation-oriented phonology*. Ph.D. thesis, University of Maryland, College Park.

Raimy, Eric. 2000. *The phonology and morphology of reduplication*. Berlin, Boston: De Gruyter Mouton.

Stang, Christian Schweigaard. 1957. *Slavonic accentuation*. Oslo: I kommisjon hos H. Aschehoug.

Vaux, Bert. 2000. Disharmony and derived transparency in Uyghur vowel harmony. In Masako Hirotani, Andries Coetzee, Nancy Hall, and Ji-yung Kim (eds.), *NELS 30: Proceedings of the North East Linguistic Society 30*, vol. 2, 671—698. Amherst, MA: GLSA.

Zonneveld, Wim. 1978. *A formal theory of exceptions in generative phonology*. Berlin, New York: De Gruyter Mouton.