

Vowel harmony in Ukrainian

In this paper, we examine the phenomenon of vowel harmony in Ukrainian first pre-stress syllables, which is restricted to the lax subsystem of Ukrainian vowels. The distinctive features of the Ukrainian pattern are: 1) the harmonic domain is disyllabic, and includes the syllable bearing the main stress and the syllable immediately preceding it; 2) harmony affects the height of the target vowel, yet the resulting height does not always reach the height of the trigger vowel, so it cannot be described as simple feature spreading; 3)

We formulate an account for those data in Optimality-Theoretic terms and provide comparisons with other harmonic systems described in the literature, such as Altaic, including Turkish (Zoll (1996), Ni Chiosain & Padgett (1999)), Tungusic, Classical Mongolian and Oroquen (Walker (2001)), Greek dialects (Revithiadou et. al. (2006)), Shona (Beckman (1997)), and show the analysis relates to the data from certain Ukrainian dialects, taken from Hlukhovtseva (2005).

1. Vowel harmony in Ukrainian. Ukrainian has a 6-vowel system, with outer +tense vowels [i], [u], [a] and inner -tense vowels [y], [o], [e]. Ukrainian in general preserves the system of vocalism under stressed in unstressed syllables (unlike closely related Russian and Byelorussian.) However, the [-tense] vowels in the first antestress syllable show effects of assimilation to the stressed vowel, (1-3). [+tense] vowels in pre-stress syllables are not affected, (4-6).

- (1) /ne'su/ → [ni.'su] “I carry”
(that phonological representation of the 1st vowel is indeed /e/ can be shown by other forms with the same morpheme, such as [nes.ty] “carry.Inf”)
- (2) a. /ly'tse/ → [le.'tse] “face” (cf. [ly.čko] “face.Diminutive”)
b. /zby'rala/ → [zbe.'rala] “she collected” (cf. [ne.'zby.ra.nyj] “collected.Adj”)
- (3) /γo'livka/ → [γu.'liv.ka] “head.Diminutive” (cf. [γo.lo.vu] “head.Acc”)
- (4) /a'betka/ → [a.'be.tka] “alphabet”
- (5) /bi'da/ → [bi.'da] “trouble”
- (6) /du'γα/ → [du.'γα] “curve”

Assuming the featural analysis where outer vowels are [+tense] and inner vowels are [-tense], we can say that the markedness constraint enforcing harmony overrides faithfulness to height for V[-tense], but is weaker than faithfulness to height for V[+tense]: Ident [+/-height]/V[+tense] >> Harmony >> Ident [+/-height]/V[-tense] (where Harmony is a complex system of constraints.)

The height feature always spreads from the stressed syllable onto the unstressed one, so we also have Ident [+/-height]/V[+stress] >> Ident [+/-height]/V[-stress]. Moreover, the feature [tense] cannot be shifted, so Ident [+/-tense] is undominated.

What remains to be seen is what is the exact nature of the markedness constraint(s) abbreviated as Harmony above - that is exactly what varies greatly across different languages with vowel harmony.

2. Ukrainian vs. other vowel harmony systems. The system described above is different from all other systems that we know of, though it is not completely unexpected given the typological possibilities which are known. First of all, it must be noted that Ukrainian harmony is different from those of Turkish or Shona where a harmonic feature spreads from one edge of the word to the other, starting from the initial syllable. There are two crucial differences: first, the trigger of harmony is not the initial syllable, it is the stressed syllable; secondly, Ukrainian harmony seems to work only in a limited disyllabic domain.

There are plenty of reasons to expect greater faithfulness of the initial syllable, as Beckman (1997) argues; there are also good reasons to expect greater faithfulness under stress in East Slavic languages: e.g., other two East Slavic languages, Byelorussian and Russian, show heavy neutralization of vowel contrasts in non-stressed syllables. While Ukrainian does not show it, we can expect that it

also rates vocalic faithfulness under stress higher than faithfulness without stress. Moreover, it has been noted by Paufoshima (1980) that spoken modern Russian shows the effects of [+/-round] spreading from the stressed vowel to pre-prestress heavily neutralized super-short schwa vowels. Some other cases of stress-vowel induced harmony are Pasiego Montanes (McCarthy (1984)) and Servigliano Italian (Nibert (1998)). But those languages do not show boundedness of the harmonic domain.

On the other hand, limited domain harmony was shown to hold in some Greek dialects by Revithiadou et. al. (2006). While there are two different patterns of harmony described by them, both are characterized by being restricted to a disyllabic domain. However, that domain is anchored not to the stress, but to one of the two edges of the word, and spreading targets exactly one vowel. Asia Minor dialects show different behavior in end-anchored and beginning-anchored harmony: when the harmonic domain is end-anchored, the final vowel is copied to the preceding syllable, without any regard to their underlying quality; when the domain is beginning-anchored, vowels of the first two syllables have to agree in quality, but spreading is not directional: a vowel with a less marked position on the sonority hierarchy, which can be established on the basis of hiatus resolution facts, assimilates the more marked vowel. Stress does not play any role in the process: stressed vowels are treated in the same way as non-stressed ones.

Ukrainian thus does not fall into the same class with any of the already formally described harmonic systems. In the paper we formulate an OT account of the Harmony part of the system based on the ideas that 1) harmony is preferred to no harmony; 2) only minimal violations of faithfulness are allowed (which prevents spreading of features to several vowels); 3) that only local spreading is possible; and 4) that the prestress syllable is a better target for harmony given independent faithfulness considerations. Thus we derive the disyllabicity of the domain on independent grounds, without actually assuming that there are special domain entities (unlike Revithiadou et al (2006)). Our proposal is close in spirit to Walker's (2001) account of disyllabic harmony triggers in Classical Manchu and Oroquen, in the sense that both seek to derive the surface disyllabicity from independent considerations rather than building it into the system, though the range of data to account for and exact mechanisms used are very different. Our system can also be extended to Greek disyllabic harmony cases.

3. The lax subsystem in Ukrainian dialects. Hlukhovtseva (2005) examines data from Eastern Town Ukrainian dialects and argues that while phonetic realizations of our +tense vowels are stable across dialects, the realizations of our -tense vowels show serious dialectal variation. She argues that under stress all dialects show roughly the same vocal system, but without stress, there are three subtypes of of the lax vowel system: a middle one, one where all three lax vowels are higher than in the middle system, and one where all three are lower. This supports our earlier claims of general greater faithfulness of tense vowels and stressed vowels which played the crucial role in our analysis of vowel harmony.

Another important fact is that some dialects show harmonic vowel changes of lax vowels into tense ones, which are crucially different from the phenomenon described in Section 1. Two main distinctions are that turning into +tense is not allowed in canonical harmony, and that in dialects the process may apply to a stressed vowel, which is a target for harmony spreading from a neighboring unstressed vowel (e.g., dialectal [ku.'buš.ka], cf. literary Ukr. [ku.'byš.ka]). While the exact picture of what is happening in those dialects can only be revealed after extensive empirical research, we offer suggestions about how our system can predict the observed factorial typology.

Selected references. Beckman, J.N. (1997) "Positional faithfulness, positional neutralization, and Shona vowel harmony", *Phonology*. Hlukhovtseva, K.D. (2005) "The dynamics of Ukrainian Eastern Town dialects" [in Ukr.]. Revithiadou, A., et al. (2006) "Vowel harmony in contact-induced systems: the case of Asia Minor dialects of Greek". Walker, R. (2001) "Round licensing, harmony, and bisyllabic triggers in Altaic", NLLT.