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Vowel Reduction in Particle-Based Phonology

Referring to a neutralization of vowel phoneme contrast(s) (Flemming 2005), vowel reduction in Contemporary Standard Russian has already been well studied within different frameworks (Lightner 1972, Padgett 2004, Crosswhite 2001). It is commonly suggested that vowel reduction, occurring exclusively in unstressed syllables, is related in Russian to the consonant environment (palatal or non-palatal preceding consonants) as well as the vowel position in the word (initial, pretonic or other). Therefore, due to these different contextual variants the number of reduction patterns to be realized (see 1) requires very specific rules which may not always capture relevant generalizations on vowel reduction.

Several problems can be attested. First, if according to Flemming (2005) a neutralization of contrast(s) is expected in vowel reduction, how does this generalization allow for the reduction of the underlying /o/ to the surfacing [i], since all the features of the source vowel are opposite to the features of the target vowel (example in 2)? Second, what is the motivation for vowels to be realized differently in the palatal and non-palatal consonant context? Finally, vowels in the initial syllable (even if not pretonic) without onset (as in 3), still behave as if they were in the pretonic position.

I argue that all these answers reflect a lack of previous analyses are due to the principles of base : underlying representations of vowels. I propose to reconsider the underlying representations of vowels in Russian in order to provide a formal account of vowel reduction along the lines of Particle-Based Approach (Harris 2005). I suggest that postulating 10 vowels (as briefly described in Caflisch 1995) instead of the former 5 and only one group of consonants (non-palatal) allows for a more economic approach to account for vowel reduction and palatalization at the stem level and the word level affixes (illustrated in 4).

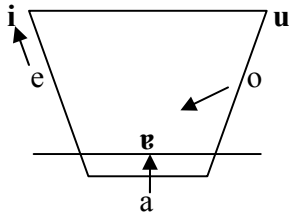
Composed of some (or all) primitive elements (I, A, U and @) with or without a head (underlined), fully specified vowels lose one of the elements when occurring in an unstressed syllable. Therefore, vowel reduction represents a loss of information. Having already been tested on different languages, among which Bielorussian (Harris 2005), the theory can predict a systematic lowering or raising of mid-vowels. For example, involving lowering in Bielorussian (illustrated in 5), the target [a] is predicted by the loss of the elements I and U in vowels /e/ and /o/ (respectively). Since the pattern of vowel reduction in Bielorussian does not depend on the consonant environment, the question of distinguished two types palatalizing from non-palatalizing vowels is not raised. It is claimed here that with the new representations of vowels (as in 4) the Particle-Based Approach can also apply to Russian. The reduction of vowels traditionally seen as those appearing after palatal consonants, can easily be explained as a suppression of phonological information. These vowels seem to have the minimal skeleton to which they are reduced when they occur in a weak (unstressed) position : the element I is necessarily present and the element @ is not the head. The reduction of the vowel /æ/, for example, will be a loss of the element A and the promotion of the previously depended element A to head position. Consequently, the reduction of the vowel /ö/ is a loss of two particles (U and A) and the promotion of the element I to head position.

The target vowels of the non-palatalizing consonants are reached in a similar way. The target [ə] is predicted by a suppression of the element A in case of the underlying /a/ and of the element A and U in case of the underlying /o/. The resulting structure consists in the presence of only one element : the element @. As argued in Harris (1994), this element @ is always present in vowels. Consequently, the ultimate reduction will always be the suppression of all the elements except the @ element. Taking into account the observation of Crosswhite (2001) that vowel reduction in Russian is a primarily raising effect to the point that underlying high vowels stay faithful, I claim that the elements, if all of them are present, are ordered : the element U is dependent on the element A (if present). Consequently, the suppression of the element A will automatically involve the loss of the element U in case of the vowels /o/ and /ö/.

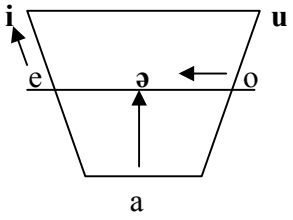
This approach to vowel reduction in Russian also gives an account of palatalization which, following Staun (2003), consists of the spreading of the element I to the preceding consonant.

(1) *After non-palatalized consonants* *After palatalized consonants*

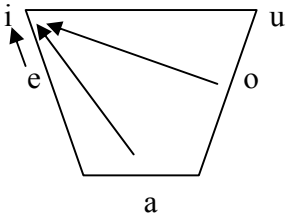
Pretonic & initial syllable without onset



Unstressed (not pretonic)



Pretonic and unstressed



(2) /lʲ**o**'tatʲ/ → [lʲ**i**'tatʲ] ('fly')

(3) /alo'morf/ → [**ɐ**lɐ'morf] ('allomorph')

(4) Proposed Particle-Based Approach Inventory

Vowels non-palatalizing consonants		Vowels palatalizing consonants	
[I, @]	ɪ	[I, @]	i
[U, @]	u	[U, I,@]	ü
[A, @]	a	[A,I,@]	æ
[A, I, @]	ɛ	[A,I,@]	e
[A,U@]	o	[A,U, I,@]	ö

(5) Belorussian

Strong syllable	i	**e**	a	**o**	u
Weak syllable	i		a		u

References

Caflisch, J. (1995). *Issues in Russian Linguistics*. Lanham, Maryland : University Press of America.

Crosswhite, K. (2001). Factorial Typology. In L. Horn (Eds.), *Vowel Reduction in Optimality Theory*. (119-140). Yale University.

Flemming, E. (2005). *A Phonetically-Based Model of Phonological Vowel Reduction*. Retrieved from http://web.mit.edu/~flemming/www/paper/vowelred.pdf

Harris, J. (1994). Melody. In J.Harris (Eds.), *English Sound Structure* (90-141). Oxford: Blackwell.

Harris, J. (1995). *The elements of phonological representations*. Retrieved from http://www.phon.ucl.ac.uk/home/johnh/papers/Durakata01.pdf

Harris, J. (2005). Vowel Reduction as Information Loss. In P. Carr, J. Durand, & C. J. Ewen (Eds.), *Headhood, Elements, Specification, and Contrastivity : Phonological Papers in Honor of John Anderson*. (119-132). John Benjamins Publishing Company.

Lightner, T. (1972). *The Underlying Vowel System. Problems in the theory of Phonology*. (Vol.1). Edmonton : Linguistic Research, Inc.

Padgett, J. (2004). Russian Vowel Reduction and Dispersion Theory. *Phonological Studies*, *7,* 81-96.

Staun, J. (2003). On Vocalic Feature Hierarchisation. *Language Sciences*, *25,* 11-158.