Opacity in Tundra Nenets

Keywords: phonological opacity, OT, stratal OT, comparative markedness, OT-CC

This study explores the phonology of Tundra Nenets (TN, Uralic language family), a language with multiple opaquely interacting processes. The case of particular interest is the process that combines metrical opacity with both counterfeeding and counterbleeding relations to other processes and to itself. The research is based on the data collected during the field study of Western (Malaya Zemlya) dialect of TN in 2003-2005.

While in derivational theories of phonology the natural way of accounting for opacity is rule ordering, Optimality Theory (OT), an inherently non-derivational theory, does not have this option. Thus, opacity presents a challenge for classic OT, which has been dealt with by various modifications to the theory (e.g., sympathy theory (McCarthy 1999), OO-correspondence (Benua 2000), turbidity (Goldrick 2001), local conjunction (Ito and Mester 2003), stratal OT (Kiparsky 2000, forthc.), Bermudez-Otero (forthc.), targeted constraints (Wilson 2000), comparative markedness (McCarthy 2003)). We show that, interestingly, the most straightforward incorporation of the rule ordering insights – stratal OT – by itself is not sufficient to describe Tundra Nenets opacity and needs to be further enriched in a non-trivial way.

In TN, ʌ regularly alternates with zero (undergoes reduction to a silent *schwa* in terms of Salminen 1997). In rule terms, vowel deletion can be stated as follows: ʌ in the final syllable is always deleted. The vowels in even syllables are then deleted, but the deletion in two syllables in a row is prohibited. The deletion is also restricted by phonotactic constraints such as Son-Seq prohibiting codas of rising sonority. A partial paradigm of the word *house* in (1) illustrates the basic deletion pattern. The sonority effects are shown in (2).

On our account, the complex pattern of vowel deletion results from the fact that ʌ deletes in metrically weak positions (TN has syllabic trochee) and in final extrametrical syllables. Both processes counterfeed themselves, as illustrated by the forms (xa)rʌd and (xardʌ)da in (1). In addition to counterfeeding, rhythmical vowel deletion itself presents an opacity problem since the metrical structure that was responsible for deletion is not apparent at the surface (Kager 1997, 1999 Kiparsky 2000, Jacobs 2004, McCarthy 2007, Bakovic to appear).

Vowel deletion interacts opaquely with two other processes in TN. First, it is in a counterbleeding relation to obstruent voicing. Dental and labial obstruents are voiced after a vowel, but if the preceding vowel is deleted, the consonant still surfaces as voiced, as illustrated by the form xardʌda ‘his house’ in (1). Second, vowel deletion counterfeeds word-final consonant neutralizations. Dental obstruents change to a glottal stop word-finally, but the process does not apply to the dentals that become word-final because of vowel deletion (cf. xarʌd ‘house’ in (1)).

The key assumption of stratal OT – that levels of optimization are motivated by morphological structure – is undermined by our data. Vowel deletion apparently applies postlexically. This is evident as deletion counterbleeds C-voicing within words but not at word boundaries, as the example (3) demonstrates. However, vowel deletion also counterfeeds word-final consonant neutralizations. If we consistently treat opacity with levels, this would mean that word-final neutralizations apply later than vowel deletion. Seemingly, the problem is that stratal OT has no room for levels after the postlexical one. However, adding a level would not resolve the problem either because vowel deletion counterfeeds itself.

To solve this problem, we examine two devices that could be added to the stratal OT formalism: conjoined constraints (Ito and Mester 2003) and comparative markedness (CM, McCarthy 2003). We argue that CM achieves better results, as the implementation of the conjoined constraints theory requires abuse of local self-conjunction (Max&Max for self-counterfeeding deletion). The tableau in (4) illustrates how stratal OT with CM for counterfeeding (self-counterfeeding of vowel deletion in this example) can be used to analyze our data.

Finally, we consider an alternative analysis based on OT with candidate chains (OT-CC, McCarthy 2006, 2007). It appears that, to capture the opaque interactions in TN, additional principles governing footing need to be introduced in OT-CC. Roughly, the need for those principles comes from the following paradox: to be able to account for word-boundary voicing OT-CC needs to evaluate two words as a whole from the beginning, but for the purposes of footing and vowel deletion the words are quite separate.

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(1)		*Input*	*Output*		
nom. sg. abs		xarʌtʌ	(xa)rʌd	'house'	
poss. 2sg		xarʌtʌrʌ	(xar)dʌr	'your house'	
poss. 3sg		xarʌtʌta	(xardʌ)da	'his house'	
(2)	a.	ngercʌda	ŋerc.da		'he scatters something'
		sʌmpʌlʲaŋg	sʌmb.lʲaŋg		'five'
		nultʌnʌsʲyʌ	nult.nʌsʲ		'to stop'
	b.	ŋosʌltasʲʌ	*ŋosl.tasʲ	ok ŋo.sʌl.tasʲ	'to turn the head upwards'
		lʌkʌmpojʌʔ	*lakm.bojʔ	ok la.kʌm.bojʔ	'good bye'
(3)	a.	nʲarma pasʌkojʌ	nʲarma baskoj		'(that) red-cheeked (one) is beautiful'
	b.	pasʌkojʌ pedara	paskoj pedara/*bedara		'beautiful forest'

(4) The analysis of the word (xa)rʌd 'house' at the postlexical level.

(xarʌ)dʌ	GR-WD= PR-WD	*ʌ-UNPARSED$_{OLD}$	WEAK>A$_{OLD}$	NON-FINALITY	FT-BIN	MAX-ʌ	*ʌ-UNPARSED$_{NEW}$	WEAK>ʌ$_{NEW}$
(xarʌ)dʌ		*!	*					
(xar)(dʌ)				*!	**	*		
(xardʌ)				*!		*		*
(xar)dʌ		*!			*	*		
☞(xa)rʌd					*	*	*	
(xard)				*!	*	**		
xard	*!					**		

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