

Less than words: Morphological Conditioning of Phonological Regularization

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Overview

- Three Russian prepositions have vowel deletion: /ko/ ‘towards’, /so/ ‘with/from’, /vo/ ‘in/into’
- Whether the vowel is deleted depends on the identity of the following morpheme, among other factors (Linzen et al. 2013):

/so dver-i-ju/	z dvérju 'with the door'	(regular)
/so dvor-om/	sə dvaróm 'with the yard'	(exceptional)

- We found in a corpus study that some affixes regularize the exceptions and some don't:

/so dvor- nik -om/	z dvórnikem 'with the groundskeeper'	(now regular)
/so dvor- ik -om/	sa dvórikem 'with the yard (dim)'	(still exceptional)

- We propose an extended scaled-constraints MaxEnt grammar that allows suffixes to affect the root's scaling factor
- We show that the difference between suffixes arises from their morphosyntactic characteristics and structural position

Scaled-constraints MaxEnt

- **Stochastic phonological variation** in MaxEnt (regular words):
/vo dver/ 'into the door'

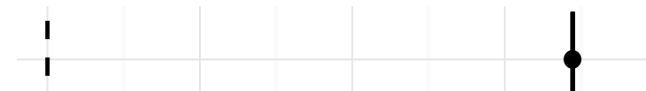



	*PREP ₇	*#CCC ₃	<i>H</i>	<i>p</i>
va dvér ^j	−1 × 7		−7	2%
v dvér ^j		−1 × 3	−3	98%

- **Lexical variation:** morpheme-specific scaling factors:
/vo dvor_{sf(#CCG)=9} / ‘into the yard’

	*P _{REP} V ₇	*#CCC ₃	<i>H</i>	<i>p</i>
va dvór	−1 × 7		−7	99%
v dvór		−1 × (3 + 9)	−12	1%

Regularization

- Proportion of cases in the Yandex corpus in which the vowel is retained in /so/ (the affix **(ə)stv** is exceptionality-reducing):

s/sa mnóg-imi with many-INST.PL	‘with many’	
s/sa mnóz-estv-əm with many-N ₂ -INST.PL	‘with multitude’	
f/və s-vid-ét-il'-ə in with-see-V-N ₃ -ACC.SG	‘into a witness’	
f/və s-vid-ét-il'-stv-ə in with-see-V-N ₃ -N ₂ -ACC.SG	‘into testimony’	

- We propose that affixes can adjust the root's scaling factor by a multiplicative **modifying factor**, e.g.:

/vo dvor_{mf(*CCC)-0}-ik_{mf-1}/ 'into the yard.DIM'

/so dvor_{sf(*#CCC)=9}-nik_{mf=0}-om/ 'with the groundskeeper'

	*P _{REP} V ₇	*#CCC ₃	<i>H</i>	<i>p</i>
va dvórik	-1 × 7		-7	99%
v dvórik		-1 × (3 + 9 × 1)	-12	1%
sa dvórníkem	-1 × 7		-7	2%
z dvórníkem		-1 × (3 + 9 × 0)	-3	98%

Extensions

- **Loanword nativization:** In Tagalog, [f] is allowed in bare loanwords but not in affixed ones (Zuraw 2000, Jurgec 2012):

bare:	<u>fi</u> lipino	'Filipino'	<u>fi</u> esta	'feast'
prefixed:	mag <u>pi</u> lipino	'language'	pam- <u>pi</u> sta	'fiesta (INST)'
suffixed:	pili <u>ni</u> no- <u>n</u>	'the Filipino'	pi <u>sta</u> -han	'festival'

- **Accentual dominance:** Affixes can override faithfulness to underlying stress in roots. We can capture this by giving the roots scaling factors for faithfulness and dominant suffixes modifying factors of zero.

Syntactic patterning

- Affixes that reduce or revoke exceptionality can attach to bare roots and give rise to idiosyncratic phonology or semantics:

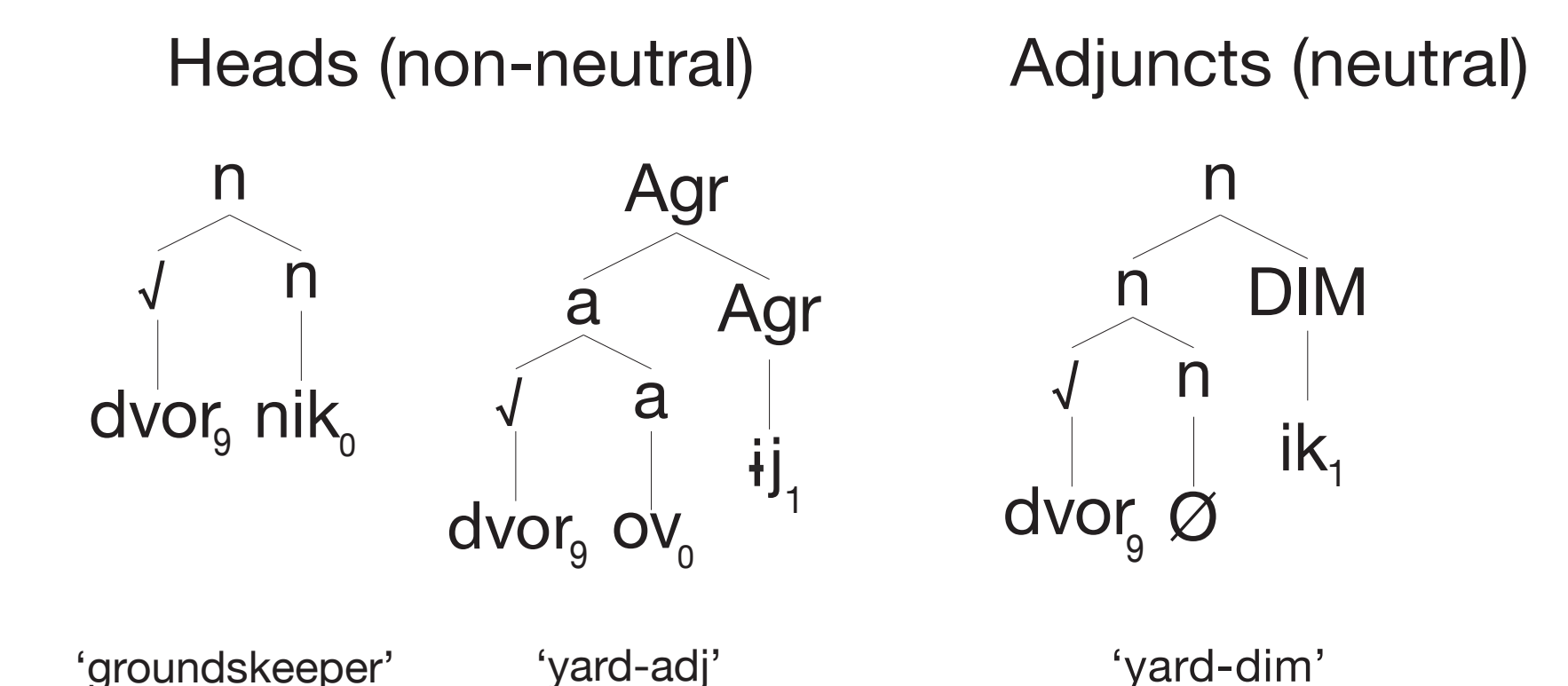
[-nik] 'N₁' sir-nik 'cheese pancake' (cf. *sír* 'cheese')
[-stv] 'N₂' azar-stv-ó 'naughtyness' (cf. *azar-n-ój* 'naughty')

- Neutral affixes attach to previously categorized stems and have fully predictable phonology and semantics:

[-ik] 'DIM' krést-ik 'cross-DIM' (cf. krést 'cross')

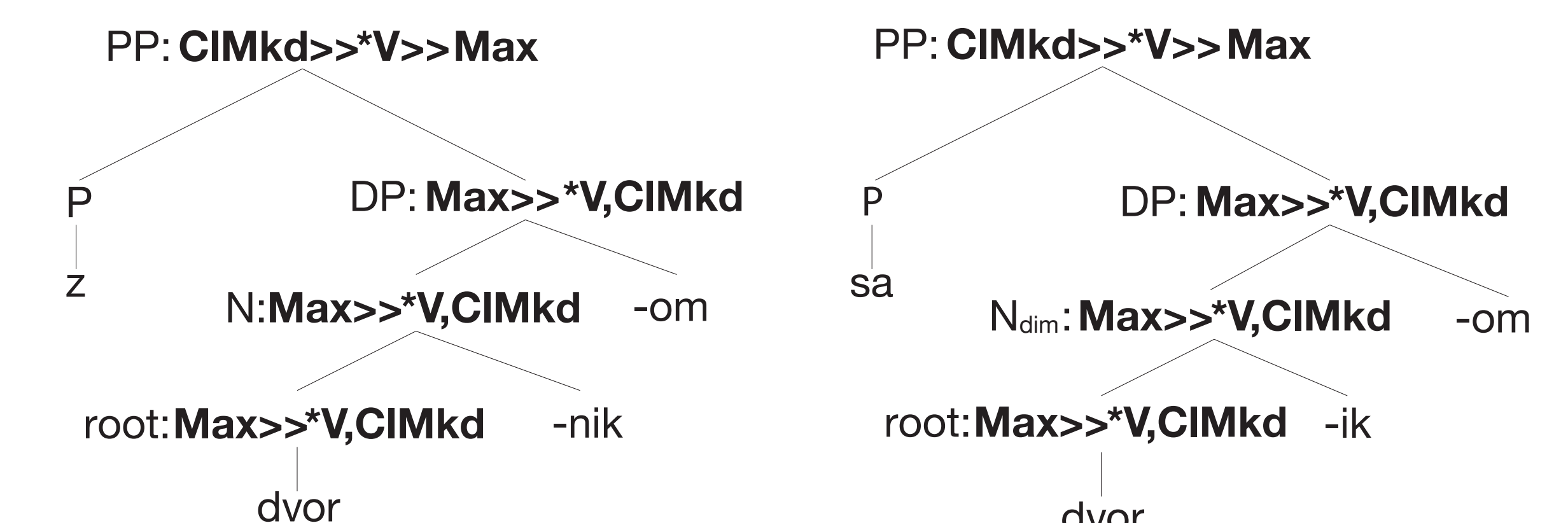
[-əsti] 'ADJ→N' xrúp-k-əsti 'fragility' (cf. xrúp-k-ij 'fragile')

- This behavior correlates with a structural distinction (cf. Marvin 2008, Embick and Marantz 2008):



Alternative analyses

- **Cophonology theory** encounters a bracketing paradox: the phonology of a preposition is affected by a lower affix



- **Lexical storage** of phrases as exceptions makes no prediction about the direction of effect; simple words can be regular while complex ones are exceptions and vice versa