

Phonetic Gradience in Vowel Chain Shift Blocking

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This paper presents a Harmonic Grammar (HG) analysis of subphonemic interactions in the Polabian Vowel Shift. This paper revises the previous rule based account of Polabian (Timberlake 1995) by proposing that velarized consonants played a more prominent role in vowel innovations than palatalized consonants and that velarization interacted simultaneously with another process: vowel chain shifting. Most extant literature modeling vowel chain shifts focuses on West-Germanic. This paper expands vowel chain shifting research and modeling beyond West-Germanic by presenting a case study from Slavic with phonological sensitivities commonly found in Slavic languages. These sensitivities force us to adopt a modeling framework able to account for phonetic gradience (Hz), thus expanding on the tradition of representing vowel height properties as a non-binary cumulative feature (Ladefoged 1971, Lindau 1978, Parkinson 1993, Minkova & Stockwell 2003, Lionnet 2016).

Polabian is an extinct West-Slavic Lechitic language (Polański 2001) which underwent numerous changes in the vowel system from Late Common Slavic (LCS). Although there is no scholarly consensus on what causes vowel chain shifts (Burns 2016), the changes in the Polabian vowel system conform to the three common principles of vowel chain shifting outlined in Labov 1994. The two Late Common Slavic (LCS) short vowels lowered and the seven LCS long oral vowels rose (e.g. LCS *\*zeŋa* > *zĩnã* 'earth', LCS *\*děva* > *devã* 'girl', LCS *\*čãša* > *coso* 'cup'). The seven long oral vowels exhibit additional properties common of vowel shifts such as diphthongization of the highest vowels and fronting of mid and high back vowels (e.g. LCS *\*zima* > *zaimã* 'winter', LCS *\*stopa* > *stũpã* 'footprint'). Cross-linguistically, the most uncommon property of the Polabian Vowel Shift is the presence of apparent shift-blocking and shift-reversing environments as shown in (1).

(1)	LCS	Polabian	(Polański & Sehnert 1967)	Expected
	<i>*žena</i>	<i>zenã</i> 'woman'		<i>zĩnã</i>
	<i>*svorka</i>	<i>svorko</i> 'magpie'		<i>svũrko</i>
	<i>*kolo</i>	<i>t'õlü</i> 'wheel'		<i>t'ũlü</i>
	<i>*voda</i>	<i>vãdã</i> 'water'		<i>vũda</i>

All exceptions to raising and fronting occur in contexts with post-vocalic velarized consonants. Certain pre-vocalic consonants enhance the effects of post-vocalic velarized consonants, but there are no instances of consonants which enhance either fronting or raising. Using Purcell 1979's findings on Russian VCV interactions as phonetic input for the HG (see Flemming 2001 for implementation of HG), I demonstrate that the correct reflexes can be generated only if the combined weight of vowel faithfulness, lowering, and backing constraints outweigh the constraints governing raising and fronting. Tableau 1 illustrates the blocked raising effect in Polabian *zenã* 'woman' from (1).

Input: <i>*zena</i> eC <sup>y</sup> F1 /e/ = 375.08 Weight:	RAISE Target = -82.81	IDENT-V Target = 0	PALATALIZED C <sup>j</sup> Target = -27.83	VELARIZED C <sup>y</sup> Target = 27.83	COST
a. [ẽ] 400	11605.75	621.00	2782.56	8.4681	23849.44
b. [e] 375	6844.25	0.00	770.06	778.96	15246.44
☞ c. [ẽ] 350	3332.75	629.00	7.56	2799.46	12893.44
d. [ĩ] 325	1071.25	2508.00	2232.56	10590.46	16790.44
e. [i] 300	59.75	5637.00	2232.56	10590.46	26937.44

Tableau 1. Blocked Raising in Polabian *zenã* 'woman'

Although the constraint governing height changes in the chain shift (RAISE) favors a target similar to that found in \**zema* → *zimǎ* 'earth', the weighted constraints favoring lowering (IDENT-V and VELARIZED C<sup>y</sup>) prevent a strong manifestation of raising from surfacing. In sum, HG's scalar treatment of height and frontness can succinctly capture the interactions of the Polabian vowel shift's subphonemic competition; a type of effect which has not been documented in previous accounts of vowel chain shifting.

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