

Inconspicuous unfaithfulness in Slovenian

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Introduction

Highlights


- ▶ We analyze the distribution of tense-lax alternations in Slovenian nouns in terms of three strong positions:
 - ▶ Nominative singular
 - ▶ Stressed syllable
 - ▶ Initial stressed syllable
- ▶ Positional faithfulness predicts that stress might be moved away from a marked segment; we show that the prediction is correct.
Our wug test confirms the productivity of the pattern.
- ▶ We discuss the detection of segmentally-induced stress shift and further inconspicuous unfaithfulness effects.

Positional faithfulness


- ▶ Strong positions, protected by positional faithfulness: syllable onset, stressed syllable, initial syllable, root, noun (Beckman 1998; Smith 2002/2005).
- ▶ Positional faithfulness predicts a language that moves the strong position away from a marked segment to eliminate it inconspicuously.
Beckman-Noyer pathology (Beckman 1998; McCarthy 2010b; Jesney 2011)

Beckman-Noyer pathology

- ▶ Reduction of underlyingly unstressed /o/:


/po'ku/	IDENT(high)'/σ	*[o]	IDENT(high)	IDENT(stress)
a. po'ku		-1		
b.  pu'ku			-1	


- ▶ Stress shift away from underlyingly stressed /o/:

/pu'ko/	IDENT(high)'/σ	*[o]	IDENT(high)	IDENT(stress)
a. pu'ko		-1		
b. pu'ku	-1		-1	
c.  'pu.ku			-1	-1

Beckman-Noyer pathology

- ▶ Surface [o] only when all underlying vowels are /o/:

/po'ko/	IDENT(high)'/σ	*[o]	IDENT(high)	IDENT(stress)
a.  pu'ko		-1	-1	
b. pu'ku	-1		-2	

'poko/	IDENT(high)'/σ	*[o]	IDENT(high)	IDENT(stress)
a.  'poku		-1	-1	
b. 'poko	-1		-2	

- ▶ Jesney (2011): the surface forms [pu'ko, pu'ku, 'po.ku, 'pu.ku] suggest faithfulness to stress, not height, making detection tricky.

Slovenian

Stress shifts away from lax mid vowels

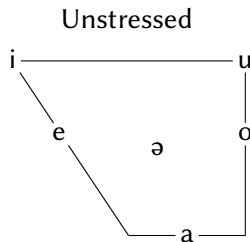
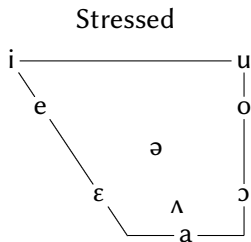
- ▶ Penultimate stress on nominatives can be either fixed or mobile:

	nominative	genitive	
Faithful stress	'mamut	'mamuta	'mammoth'
	'tɛlox	'tɛloxa	'hellebore'
	'sever	'severa	'north'
Mobile stress	'zakon	za'kona	'marriage'
	'jɛzik	je'zika	'tongue'
	'trebux	tre'buxa	'stomach'

- ▶ Tensing [ɛ → e] in [je'zika] follows from loss of stress.

Tensing in unstressed positions

- ▶ Tensing [$\epsilon \rightarrow e$] in [je'zika] follows from loss of stress.
- ▶ Slovenian vowels: [$\epsilon, \text{ɔ}$] only in stressed syllables (Jurgec 2006, 2011)



Lexicon study

- ▶ 2181 nouns from a dictionary (Toporišič 2001), of which 360 trochees.
- ▶ Includes all nouns with [ɛ, ɔ] and random samples for each other stressed vowel.
- ▶ **Lax mid vowels cause more stress shift**

'σ	stress	<i>n</i>	% mobile			
[a]	faithful	72		'mamut	'mamuta	'mammoth'
	mobile	14	16%	'zakon	za'kona	'marriage'
[ɛ, ɔ]	faithful	11		'tɛlox	'tɛloxa	'hellebore'
	mobile	58	84%	'jɛzik	je'zika	'tongue'
[e, o, i, u]	faithful	204		'sever	'severa	'north'
	mobile	1	<1%	'trebux	tre'buxa	'stomach'

Slovenian analysis

- ▶ Our analysis: mid lax vowels [ɛ, ɔ] are bad in derived forms; stress is moved away to eliminate mid lax vowels inconspicuously.
- ▶ An example of the Beckman-Noyer pathology (Beckman 1998; McCarthy 2007a,b, 2008, 2010b; Jesney 2011).
Revealed here as non-pathological.
- ▶ Shift away from [a] unmotivated; not generalized.

Next:

- ▶ Our wug-test (Berko 1958) shows that stress shift is significantly more acceptable with lax mid vowels [ɛ, ɔ] than with tense [e, o, i, u] or low [a].

Experiment

Participants

- ▶ Data from 145 speakers who completed our survey, self-reported as living in Slovenia and being 18 y/o or older. Other data discarded.
- ▶ Gender: 90 female, 36 male, 19 didn't report.
- ▶ Age: 18–66, mean 31, median 29.
- ▶ Self-reported dialects: 79 central (Ljubljana area) and 67 other (mostly coastal).

Stimuli

- ▶ NOM-GEN nonce paradigms, 10 per vowel (70 total), paired consonants for mid vowels:

		tense			lax			
high	[i]	'bidip	'bidipa	bi'dipa				
	[u]	'nugaɟ	'nugaʒa	nu'gaʒa				
mid	[e]	'tʃetot	'tʃetota	tʃe'tota	[ɛ]	'tʃetot	'tʃetota	tʃe'tota
	[o]	'xɔʒat	'xɔʒada	xo'ʒada	[ɔ]	'xɔʒat	'xɔʒada	xo'ʒada
low					[a]	'matʃul	'matʃula	ma'tʃula



- ▶ Recorded by a 45 y/o male native speaker of standard Slovenian.

Procedure

- ▶ 20 random paradigms per participant: 4 high, 6 mid tense, 6 mid lax, 4 low.
- ▶ Delivered using Experigen (Becker & Levine 2012), experigen.phonologist.org/si/.
- ▶ Two NOM-GEN paradigms in random order, each judged as good or bad.

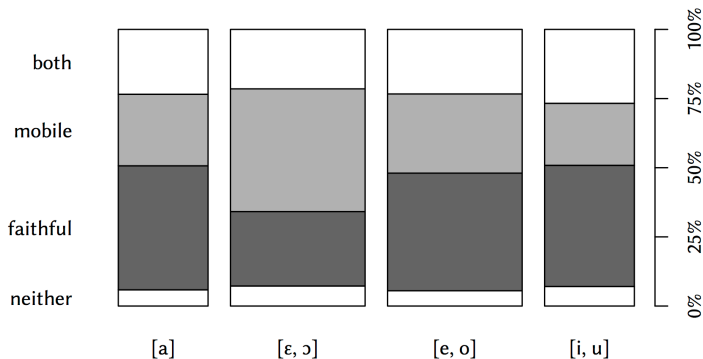
To je moj _____.

Ali imaš svojega _____?

	<input type="button" value="v redu"/>	<input type="button" value="ni v redu"/>
	<input type="button" value="v redu"/>	<input type="button" value="ni v redu"/>

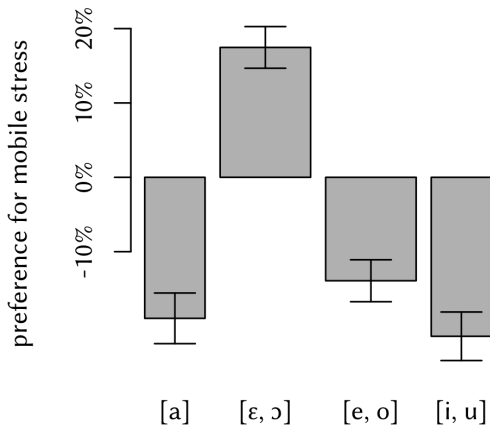
Results

- ▶ Preference for one of the genitives in 70% of all trials.



Mobile stress

- ▶ Trials with only one accepted genitive:
 - Tense vowels, [a]: faithful stress significantly more acceptable
 - Lax mid vowels: mobile stress significantly more acceptable



Statistical analysis

- ▶ Mixed effects logistic regression model with maximal random slopes, using *lme4* (Bates et al., 2015).


	β	SE(β)	z	p -value
(Intercept)	.23	.13	1.74	
<i>mid lax vs. low or tense</i>	.82	.12	6.95	<.0001
<i>low vs. tense</i>	-.07	.21	-.32	>.1
<i>dialect</i>	.51	.21	2.43	<.05

- ▶ Stress shift significantly more acceptable with [ɛ, ɔ].
- ▶ No difference between [a] and the tense vowels [e, o, i, u].
- ▶ Significantly more mobile stress in the Ljubljana area.

Analysis

Effect of *LAX & positional faithfulness

- ▶ Nominative /'tʃɛtɔt/ surfaces faithfully
Lax vowels are protected in the nominative singular

/'tʃɛtɔt/	IDENT(ATR)/NOM.SG	*LAX
a.  'tʃɛtɔt		-1
b. 'tʃɛtɔt	-1	

- ▶ Speakers are more faithful to the categories they know best, cf. Albright (2008)

Russian frequencies from Samojlova & Slioussar (2014):

- ▶ nominative most frequent case
- ▶ singular most frequent number
- ▶ nominative singular most frequent combination

Effect of *LAX & positional faithfulness

Genitive with lax vowel:

- ▶ Positional faithfulness prevents tensing under stress

/ʔɛtot + a/	IDENT(ATR)/σ	*LAX	IDENT(stress)
a. ʔɛtot-a		-1	
b. ʔɛtot-a	-1		
c. ʔɛ'tot-a			-1


- ▶ IDENT(stress) ≫ *LAX for 11 words that keep stressed lax vowel

/ʔɛtot + a/	IDENT(ATR)/σ	IDENT(stress)	*LAX
a. ʔɛ'tot-a			-1
b. ʔɛtot-a	-1		
c. ʔɛ'tot-a		-1	

Effect of *LAX & positional faithfulness

Genitive with tense or low vowel:

- ▶ Nothing penalizes the FFC

/'tʃetot + a/	IDENT(ATR)/'σ	*LAX	IDENT(stress)
a.  'tʃetot-a			
b. tʃe'tot-a			-1
c. 'tʃetot-a	-1	-1	

- ▶ The analysis cannot derive shift away from [e] or [a] (15 items), e.g. ['zakon ~ za'kona].
These are memorized; assigned low probability by the grammar.
- ▶ Zuraw (2000) et seq.: the grammar is learned from all words, but it doesn't necessarily generate all words productively from their parts.

No more pathology

- ▶ Beckman-Noyer pathology (Beckman 1998; McCarthy 2010a; Jesney 2011): languages don't move the prominent position away from an unfaithful segment.
- ▶ Tableau from Jesney (2011), Slovenified

/'tʃetot + a/	IDENT(ATR)/'σ	*LAX	IDENT(ATR)	IDENT(stress)
a. 'tʃetot-a		-1		
b. 'tʃetot-a	-1		-1	
c. tʃe'tot-a		-1		-1
d. tʃe'tot-a			-1	-1

- ▶ Jesney (2011): Parallel OT cannot prevent [Slovenian]; Harmonic Serialism can.
- ▶ Slovenian can be analyzed in Harmonic Serialism in two steps (cf. Gietz et al. 2016, but see Pruitt 2010, 2012).

Harmonic Serialist analysis

- ▶ Start at FFC (a) → remove stress (b) → reassign to any non-lax vowel (c) → reduce unstressed lax (d) → convergence.

/tʃɛtot + a/	IDENT(ATR)/'σ	*LAX	IDENT(ATR)	IDENT(stress)
a. 'tʃɛtot-a		-1		
b. tʃɛtot-a		-1		-1
c. tʃɛ'tot-a		-1		-1
d. tʃe'tot-a			-1	-1

- ▶ How do we make (a) → (b) harmonically improving?
Could be *LAX/stress, even if dominated by IDENT(ATR).
- ▶ (b) → (c) improving due to CULMINATIVITY.

More on the role of *LAX

Final stress: Tensing without stress shift

- ▶ Lax vowels become tense in some lexical items:

		NOM	GEN	
Faithful	'σ	'tʃʊək	'tʃʊeka	'chatter'
	σ'σ	ak'tsɛnt	ak'tsɛnta	'accent'
Alternating	'σ	'sʊɛt	'sʊɛta	'world'
	σ'σ	u'spɛx	u'spɛxa	'success'

- ▶ Monosyllables protected from alternation:

	monosyllabic	polysyllabic
Faithful	208	139
Variable	38	36
Alternating	53	224
% faithful	76%	39%

Monosyllables and positional faithfulness

- ▶ Why do monosyllables alternate less than polysyllables?
 - ▶ ['sʊɛt ~ 'sʊɛta] violates **initial syllable faithfulness**.
 - ▶ [us'pɛx ~ us'pɛxa] leaves the initial syllable unchanged.
 - ▶ Initial syllable faithfulness (Steriade 1994, Beckman 1997, 1998; Casali 1998; Barnes 2006; Jesney 2011; Becker 2008; Becker et al. 2011, 2012, to appear; Gouskova & Becker 2013; Becker & Gouskova 2016).
- ▶ IDENT(ATR)/'σ1
 - ▶ **triggers** stress shift in most penult-stress roots (84%),
 - ▶ **prevents** alternations in most monosyllabic roots (76%).
- ▶ IDENT(ATR)/'σ
 - ▶ protects lax vowels in roots with non-initial stress.

Conclusions

- ▶ Tense vowels are undisturbed; allow penultimate stress freely.
- ▶ Mid lax vowels [ɛ, ɔ] are tolerated in the NOM.SG.

In derived forms, *LAX conflicts with faithfulness:

- ▶ lambs: no special protection, lax vowels eliminated in most lexical items, e.g. [u'spɛx ~ u'spɛxa].
- ▶ Monosyllables: initial syllable faithfulness protects lax vowels in most lexical items, e.g. ['ʃvɛk ~ 'ʃvɛka].
- ▶ Trochees: initial syllable faithfulness triggers stress shift in most lexical items, e.g. ['jɛzik ~ je'zika].

Confirmed to be productive in nonce words.

- ▶ In the lexicon, shift away from [a], e.g., ['zakon ~ za'kona].
Unmotivated, not generalized to nonce words (Surfeit of the stimulus, Becker et al. 2011, 2012).

More inconspicuous unfaithfulness effects

Which unfaithful mappings dare not speak their name?

- ▶ Moving stress away from an epenthetic vowel is robustly attested (e.g. Alderete 1999).
- ▶ Other effects may lurk in the literature, e.g. Egyptian Arabic stress + vowel shortening:

[ˈʃa:.fi.t] + [u] → [ʃa.'fi.tu], *[ˈʃa.fi.tu] ‘she saw + it’

Hayes (1995): L→R trochees, shorten unstressed vowels

Becker (January 2017): don’t stress shortened vowels

Protection of the NOM.SG

- ▶ Slovenian: IDENT(ATR)/NOM.SG \gg *LAX.
- ▶ More generally: stronger markedness pressure on less frequent categories.
- ▶ Another possibility: the NOM.SG is protected because it's underived, cf. Non-Derived Environment Blocking (Kiparsky 1973, 1993; Łubowicz 2002; Mascaró 2003; van Oostendorp 2007; Anttila 2009; Wolf 2008).
- ▶ Similar cases in many other languages (Jurgec 2014, 2016; Jurgec & Bjorkman 2016).

The typology of inconspicuous unfaithfulness

Are inconspicuous unfaithfulness cases rare?

- ▶ Our biggest typological studies are rule-based:
 - ▶ WALS (Dryer & Haspelmath 2013) focuses on phonemes and phonotactics.
 - ▶ P-base (Mielke 2007): rules/processes (assimilation, deletion, etc).
No info on positional faithfulness.
- ▶ Faithfulness and positional faithfulness are unique to OT, and they make surprising predictions (Beckman 1997, 1998; Smith 2002/2005; Jesney 2011).
No large OT-oriented database to compare the predictions to.
- ▶ As Jesney (2011) notes, some inconspicuous unfaithfulness cases might be misanalyzed/reanalyzed.
- ▶ The Slovenian lexicon has exceptions; a wug test was necessary to establish the generalization.

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Analysis without positional faithfulness

- ▶ We can add *ANTEPENULT to encourage stress shift.

/ʔʌtət + a/	*LAX	IDENT(stress)	*ANTEPENULT
a.  ʔʌtət-a			-1
b. ʔʌ'tət-a		-1	

- ▶ *ANTEPENULT won't single out lax mid vowels without *LAX.
- ▶ Without positional faithfulness, *LAX can only cause tensing, not shifting. Tensing under stress cannot be prevented.

/ʔʌtət + a/	*LAX	IDENT(stress)	*ANTEPENULT
a. ʔʌtət-a	-1		-1
b.  ʔʌtət-a			-1
c. ʔʌ'tət-a		-1	

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