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Vowel Adaptation in Zazaki*

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1. Introduction

- Are there abstract representations in phonology?
- Do speakers perceive non-native contrasts veridically?[1]
- Do speakers pay attention to non-phonemic contrasts in their own language?[2]
- Do borrowers employ knowledge of the source language?[3]
- "Is there linguistic evidence suggesting that it is the **structure** rather than the **sociolinguistic history** of the speakers that is the primary determinant of the linguistic outcome of language contact?"

YES!

- This case study of vowel adaptation from Turkish to Zazaki provides evidence for a 'yes' answer to all the above.

* Many thanks to Donca Steriade and Michael Kenstowicz for their input, as well as to our consultant Gulcem Aktas for her information, good company, and fabulous Kurdish cooking. Any errors are of course mine alone.

[1] No: see e.g. Pallier *et al.* (1997), Idsardi & Imsri (2002). Yes: Escudero & Boersma (2002), Best (1995). [u] versus [u_], as a within-category distinction, should be perceived at a poor to moderate rate, but [o] versus [o_] at a moderate to very good rate (category vs deviant or uncategorized token).

[2] No: see Whalen et al. (1997), Kazanina (2003). Yes: Jones (2000), Pegg & Werker (1997), Utman et al. (2000), Walter (2004).

[3] No: Silverman (1992).

- The segment [o_] is repaired, but [u_] is borrowed faithfully.
- This corresponds to a structural difference in the phonology of Zazaki, in which [u_] surfaces as a conditioned allophone but [o_] does not.
- Borrowed [u_] in novel environments is leading to a full-fledged phonemic contrast.

The ultimate effect of language contact in this case is to enhance an existing structural distinction, rather than introduce a new one.

2. The linguistic environment

Figure 1: Area map of Zazaki linguistic community.

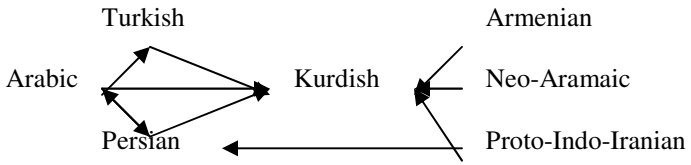

Figure 2: Subset of contact influences on and around Zazaki.
(adapted from Kahn 1976)

(1)	a. Kurdish	Sorani, Kurmanji, Zazaki....
	b. Turkish	Standard Turkish, Azeri Turkish....
	c. Arabic	Classical, Levantine, Eastern....

2.1 Sprachbund phenomena

- construct/linking particles
- ergativity
- segment borrowing (Arabic pharyngeals, ?Armenian aspiration)
- phonotactics: simple onsets, complex codas, generally final stress
- either/or construction *etc*., shared function words
- massive vocabulary transfer (Armenian as relative of Persian; below)

	Native	*Arabic*	*Persian*
Turkish roots	1443	2468	626

Table 1: Partial breakdown of Turkish root etymologies (TELL).

Language	*Arabic*	*Turkish*	*European*	*Total*
Zazaki	7	3	0	22
Turkish	7	n/a	2	22

Table 2: A glance at Zazaki and Turkish vocabulary origins.
Etymological breakdown of entries from randomly chosen dictionary page (Turgut 2001 and Hony 1947, respectively).

Currently:

- Turkish is the primary influence on Zazaki.
- All education and public life conducted in it.
- High degree of Turkish/Zazaki bilingualism for at least a century.

3. The vowel systems

3.1 Inventories

Turkish vowel inventory

i	u	ɪ	u
e	o	a	o

Figure 3

Zazaki vowel inventory

i		u
e	ɪ	o
	a	

Figure 4

Vowel length is contrastive in both languages.

3.2 Zazaki /u/ allophony

Although not phonemic, the segment [u_] does surface in Zazaki as a conditioned allophone of /u/ following coronal consonants.

(2)	*UR*	*SR*	*Gloss*	
	a. ΣuanE≅	Σu_anE≅, ΣuanE≅		'shepherd'
	b. Zu	Zu_, Zu	'one'	

Fed by word-internal hiatus-resolving raising:

(3)			
	a. dEwE≅ + E	dewi≅E	'camel (fem.)'
	b. t^ho + o	t^hu_yo	'you and'

- The alternation is variable and characteristic of fast, informal speech.

3.3 Phonetic basis for the alternation

Vowel	ɪ	ɪɪ, i, u, uu	e, a, aa, o, oo	ee
Duration (ms)	44	60-73	92-117	138

Table 3: Average vowel durations (4 tokens each).

High vowels tend to be much shorter than the others.

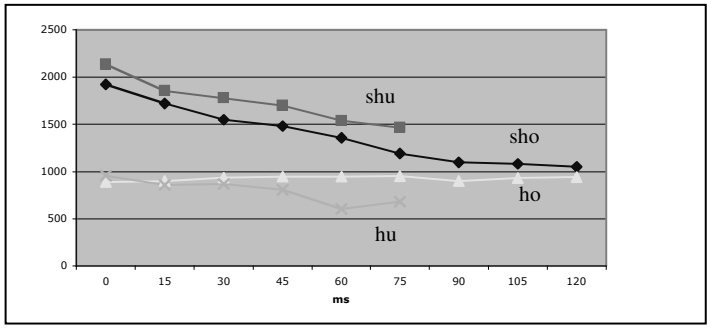

Figure 5: Progression of F2 in Hz (x-axis) over time (y-axis) (averaged over three tokens per CV stimulus).

Due to the length discrepancy, the coarticulatory fronting influence of a preceding coronal extends over a longer proportion of high vowels.
Mid /o/ reaches its F2 target, but high /u/ does not.

3.4 L2 exposure: A helping hand?

- Exposure to tokens of /u_/ in Turkish may help reinforce its status in Zazaki.
- Such exposure might also introduce another bias in favor of [u_] versus [o_], though frequency data is inconclusive:

(4) a. /u_/-initial dictionary entries: 156
b. /o_/-initial dictionary entries: 177
c. /u_/-containing TELL entries: 1907
d. /o_/-containing TELL entries: 669

- The frequency asymmetry, if any, is offset by salience discrepancy.
  - High vowels are typically shorter than mid vowels
  - The epenthetic vowel, which cross-linguistically is typically the shortest and most variable in a language (Lombardi 2002), is [u_] in Turkish.
  - [o_] is expected to be longer and therefore more salient to Zazaki speakers.

4. Adaptation

- Path of transmission problem.
- Solution: consider only loans of unambiguously Turkish origin.
- Corpus: ~400 loanwords, available online (see references).

4.1 Treatment of [o_].

Reflex	*# of tokens*
o/ue[4]	21
u	5
o_	2
ew	1

Table 4: Borrowed reflexes of [o_].

Zazaki	*Turkish*	*Gloss*
a. guere, gore	göre	about, according to
b. kuek, kok	kök	root, origin
c. kufta	köfte	meat rissole
d. öf	öf	interjection of disgust
e. öhö	öhö	interjection of contempt

Table 5: Selected [o_] loanwords.

- [o_] is typically borrowed as its mid back counterpart or its alternant, with a handful of exceptions as /u/.
- Preservation occurs in only a couple of onomatopoetic cases.
- The segment surfaces nowhere else except in one elicited verb, where it also appears to condition a preceding palatal velar:

(5) k^{h}j**o_**tbira ‘was sleeping’

[4] In the dictionary, though not for our informant, this pair alternates freely.

4.2 Treatment of [u_].

Reflex	*post-coronal*	*post-non-coronal*
u_	16	10
u	1	15
ɪ	6	3
uɪ	1	7
i	2	1
e	0	1
Total	26	37

Table 6: Borrowed reflexes of [u_].

Zazaki	*Turkish*	*Gloss*
a. düz	düz	flat, straight
b. sürgün	sürgün	pursuit, exile
c. gurz	gürz	iron club, mace
d. buelıg	bölük	part, subdivision
e. guerım	görüm	sister-in-law
f. kuıt	küt	blunt

Table 7: Selected [u_] loanwords.

- Faithful preservation occurs.
- It is the preferred option when phonotactically licit (i.e. post-coronal).
    - In this case, the usual alternation with back /u/ cannot apply.
- Also occurs in novel, non-post-coronal environments, though not as often.
- This parallels the distribution of native [u_] tokens in dictionary:
    - 46 post-coronal
    - 6 post-non-coronal.

5. A Quick OT Analysis

For the native system:

	1	2	3	4	5	6
	* o_	*C V +fr +hi -fr	FAITH[C]	* u_	FAITH[RD]	FAITH[V]
1a. /ko_l/						
1b. kol						*
1c. ko_l	*					
2a. /ku_l/						
2b. kul						*
2c. ku_l				*		
3a. /tu_l/						
3b. tul		*				*
3c. tu_l				*		
4a. /tul/						
4b. tul		*				
4c. tu_l				*		*

Table 8: Tableau for native allophony process.

Constraints 2 and 4 variably ranked with respect to each other.

For the new periphery:
Fix ranking of constraints 2 and 4.
Promote constraint 5 above constraint 4.

6. Conclusions

6.1 The Lexicon

- Speakers have knowledge of the source language phonology, and use it to avoid alternations that would otherwise be expected based on the native phonology.
- Lack of expected alternations and presence of a segment in novel environments results in a new stratum in the lexicon, with less restrictive markedness conditions, in the sense of Ito & Mester's (1999) core/periphery distinction.

6.2 Perception

- Non-native/allophonic contrast is perceived veridically.
- Note that no claim is made about the *perceptibility* of [o_] vs [u_].
- [o_] could be perceived, but not produced, in a loanword model that dissociates perception and production grammars such as Kenstowicz's (2001).
- In fact, discrimination of the round versus unround counterparts is expected to be *better* for mid than high vowels in the model proposed by Best (1995).
- The difference between [u] and [u_] (a within-category distinction), should be perceived at a poor to moderate rate, but the difference between [o] and [o_] at a moderate to very good rate (category vs deviant or uncategorized token).

6.3 Production

- The existence of an abstract phonological representation, whether phonemic or allophonic, implies the existence of an acoustic/articulatory target.
- In a production analogue to Kuhl's (2000) perceptual magnets, such a target establishes a prototype that may be held in long-term memory, independently of transitory acoustic information.
- In its absence a given token (e.g. of [o_]) might still be produced, but not purposefully.

The existence of a representation is a precondition for phonological processes making reference to it.
The presence of a structural category, even if allophonic, facilitates further language change in comparison to phones which lack one.

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