Interaction of phonological and morphological constraints in vowel adaptation of Turkish loanwords in the Cretan dialect

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1. Introduction

Two or more languages come in contact when they are used "in the same place at the same time" and one, among others, common result of contact is the word borrowing (Thomason 2001). The one language acts as the "donor" (source language, L2) and the other language acts as the "recipient" (L1) of borrowings or loanwords.

In the recent research does not exist any common view regarding the factors which play the crucial role and determine in which way and form the loanwords will be adapted in the recipient language. One view supports that perceptual factors influence the adaptation of loanwords (e.g. Paperkamp & Dupoux 2003) and the opposed view claims that perception plays almost no role and that the phonological factors are the ones who determine the form of the adapted loanwords (e.g. Paradis 1995; Paradis & LaCharité 1997; Jacobs & Gussenhoven 2000; LaCharité & Paradis 2005, among others). A third view combines the two previous ones, namely that perceptual and phonological factors influence the loanwords adaptation (e.g. Silverman 1992; Yip 1993, 2006; Kenstowicz 2001; Broselow 2004; Kenstowicz & Suchato 2006; Rose & Demuth 2006; Shinohara 2006). The latter approach is depicted schematically as: *L2 source → perceptual module → non-native percept → L1 grammar → adapted loanword* (from Yip 2006:951). A more recent view supports the idea that adaptation involves "the phonological and phonetic comprehension and production mechanisms in L1" (Boersma & Hamann 2009).

In the dialect of Crete there are quite a lot of words borrowed from the Turkish language, which were adapted and in many cases repaired in order to match the Greek phonological and morphological system and they were finally incorporated in the native vocabulary. These words are still in use in the colloquial speech, not only in Crete, but most of them are realized in other Greek dialects and in Standard Greek too. The Turkish loanwords in the Cretan vocabulary are the result of a long-lasting language contact with the Turkish people (from 17th - beginning of 20th century). In this study arise the following research questions:

i. How are these Turkish loanwords incorporated in the native Cretan vocabulary and which factors influence their vowel adaptation?
ii. Are the repairs guided only by constraints from the Greek phonological system or the speakers still "respect" constraints/features from the source grammar?

The paper is structured as follows: After the introduction (section 1), we present briefly the Greek and Turkish vowel system in section 2. In section 3 follow the data description, analysis and a concluding discussion.

2. Brief presentation of the vocalic system in Greek and Turkish

The Greek phonological system includes the 5 primary vowels, namely /i, e, u, o, ɐ / (Table 1). In Greek the front vowels /i/, /e/ have a back rounded counterpart /u/, /o/, respectively. The low vowel has been described in the Greek literature as a central, near-open /ɐ/ (e.g. Arvaniti 2007; Baltazani 2015) or as a central open /ä/ (e.g. Trudgill 2009). (Note: Throughout the paper the vowel /ɐ/ will be written in the examples as [a]).

In I. Kappa & M. Tzakosta (eds), 2019. *Proceedings of the 7th International Conference on Modern Greek Dialects and Linguistic Theory*, 84-94. Patras: University of Patras.

FRONT - round	BACK +round	
i	u	[+high]
e	o	[-high, -low]
ɐ		[+low]

Table 1: *Greek vowels*

The Turkish language has 8 vowels in its phonemic inventory, namely /i-y, e-œ, ɯ-u, o, a/ (inter alia, Zimmer & Orgun 1999; Lewis 2000; Göksel & Kerslake 2005), see (Table 2). In the Turkish vowel system there are three pairs of unrounded/rounded vowels, namely the front vowels /i/, /e/ have a rounded counterpart /y/, /œ/, respectively, the back round vowel /u/ has the unrounded counterpart /ɯ/ but the back rounded [-high, -low] vowel [o] lacks an unrounded one. The low, unrounded vowel /a/ is described either as a central one (Zimmer & Orgun, 1999:155; Yavuz & Balcı 2011:36) or as a back one, which may (phonologically) pattern only with the back unrounded vowels /a/ and /ɯ/ in the processes of *fronting vowel harmony* (Lewis 2000: 12, 14-15; Göksel & Kerslake 2005: 9-10, 21). Three of the Turkish vowels are not present in the Greek native system, namely the front, rounded /y/ and /œ/ and the back, unrounded /ɯ/.

FRONT		BACK		
-round	+round	-round	+round	
i	y	ɯ	u	[+high]
e	œ		o	[-high, -low]
		a		[+low]

Table 2: *Turkish vowels*

In the Greek vowel system is active the language-specific constraint [α back, α round] which determines the acceptable features combination in non-low vowels, namely in the latter vowels the feature values for [back] and [round] must agree, i.e. [+back, +round] : [u, o] and [-back, -round]: [i, e]. In the Greek system the feature combination *[α back, β round] is not allowed, specifically the vowels *[-back, +round]: [y, œ] and *[+back, -round]: [ɯ] are excluded.

We will show that loanwords from Turkish (source language, L2) often enter the Cretan dialect (recipient language, L1) with vocalic segments that violate the [α back, α round] constraint and are *ill-formed* according to the L1 phonological system, namely the front rounded segments [y] and [œ] and the back, unrounded /ɯ/, which must be repaired in order to be acceptable in Greek.

3. Vowel adaptation of Turkish loanwords in the Cretan dialect

3.1. Data description and analysis

The data for the loanwords of Turkish origin that occur in the Cretan dialect (and the related Turkish words) are drawn from Ksanthinakis (2000) and Orfanos (2014) and most of them

have been tested during our fieldworks. Throughout the paper the word stress is indicated only in the Greek words. The source words are stressed on the final syllable as most roots in Turkish and in cases of examples with non-final stress, this will be indicated (for a detailed description for the stress placement in Turkish and specially in irregular roots, compounds, roots with stressed/unstressed suffixes etc., see Göksel & Kerslake 2005: 26ff, Ch. 4).

In data (1) and (2) the Turkish [±high, -back, +round] vowels /y/, /œ/ only realize faithfully their [±high] and [+round] feature combination in the adapted loanwords and, due to the Greek phonological constraint [αback, αround], the source [-back] feature is delinked and it is realized by default the [+back] one which is related to the [+round] vowel (for similar vowel adaptations of French loanwords in Russian, see Paradis 2006). Therefore the source vowels /y/ and /œ/ are realized as [u] and [o], respectively, namely with the acceptable feature combinations [+high, +back, +round]:[u] and [-high, (-low), +back, +round]: [o]. The latter vowel adaptations seem to be context-free, namely the place of articulation of the preceding or following consonant seems to play no role.

The Turkish vowels /y/ and /œ/ are also adapted as [u] and [o], respectively, in the adapted loanwords occuring in other languages, e.g. Bulgarian, Romanian, Serbian (Radisic 2014 and references therein).

	Turkish		Cretan dialect	Gloss
(1)	**[y]**	→	**[u]**	
a.	[mylk]		[múlc-i]	estate (Neu. Nom. Sg.)
b.	[myʃteri]		[musterí-s]	client / buyer (Masc. Nom. Sg)
c.	[dyɲa]		[duɲá-s]	people / world (Masc. Nom. Sg)
d.	[dykan]		[dutʃáɲ-i]	shop (Neu. Nom. Sg.)
e.	[dydyk]		[dudúte-i]	rumor (Neu. Nom. Sg)
f.	[syrme]		[surmé-s]	bolt (on the door) (Masc. Nom. Sg)
g.	[syrykleme]		[suruklemé]	slovenly, lightsome (Fem. Nom. Sg)
h.	[jyryd(ym)]		[ɟurud-ó][1]	attack, march on
i.	[myjde]		[muzdé-s]	good news (Masc. Nom. Sg)
j.	[bytyn]		[butún-ikos]	whole/total (ADJ. Masc. Nom. Sg.)
(2)	**[œ]**	→	**[o]**	
a.	[cœr]		[cór-os]~[te ór-os]	squint-eyed (ADJ.Masc. Nom. Sg)
b.	[cœfte]		[cofté-s]~[te ofté-s]	meatball (Masc. Nom. Sg)
c.	[cœhne]		[te oxné-s]~[te okné-s]	idler (ADJ. Masc. Nom. Sg)
d.	[ɟœtʃ]		[ɟóts-a]~[ʒótsa]	disaster (Fem. Nom. Sg)
e.	[dœrt]		[dórt-i]	four (Neu. Nom. Sg.)
f.	[gœl]		[ɟól-i]	lake, soaking wet (Neu. Nom. Sg.)
g.	[dœner] kebab		[donér]	compacted sliced meat

In the following loanwords in (3) the Turkish [+high, +back, -round] vowel /ɯ/ realizes faithfully the features [+high, +back] and changes the feature [-round] to [+round]. Specifically it occurs delinking of the [-round] feature and default realization of the [+round] one which is associated to the faithfully preserved [+back] feature, thus resulting in the acceptable feature combination [+high, +back, +round]: [u]. The latter vowel adaptation as [u] occurs in the environment of preceding or following consonants with various places of articulation, e.g. the adapted vowel may be between a Coronal [n] and a Dorsal [k] (3a), or between a Dorsal [k] and a Labial [f] (3b), or between a Labial [m] and a Coronal [s] (3e).

[1] Variable realizations: [ɟurd-ó] ~ ɟurd-ízo] ~ [ɟurd-érno] (see Orfanos 2014: 104).

	Turkish		Cretan dialect	Gloss
(3)	**[ɯ]**	→	**[u]**	
a.	[sandɯk]		[sendút^{e}-i]	trunk (Neu. Nom. Sg.)
b.	[vakɯf]		[vakúf-i]	estate offered to a monastery (Neu.)
c.	[damɯzłɯk]		[damuzlút^{e}-i]	stud (horse) (Neu. Nom. Sg.)
d.	[mansɯp]		[ma(n)súp-i]	high rank (Neu. Nom. Sg.)
e.	[dʒamɯs]		[dʒamúz-a][2]	buffalo (Fem. Nom. Sg.)
f.	[zardʒɯ]		[zardʒú]	crapshooter (Fem. Nom. Sg.)

The vowel adaptations and their realizations in the Cretan dialect (see data 1-3), are presented schematically in Table (3).

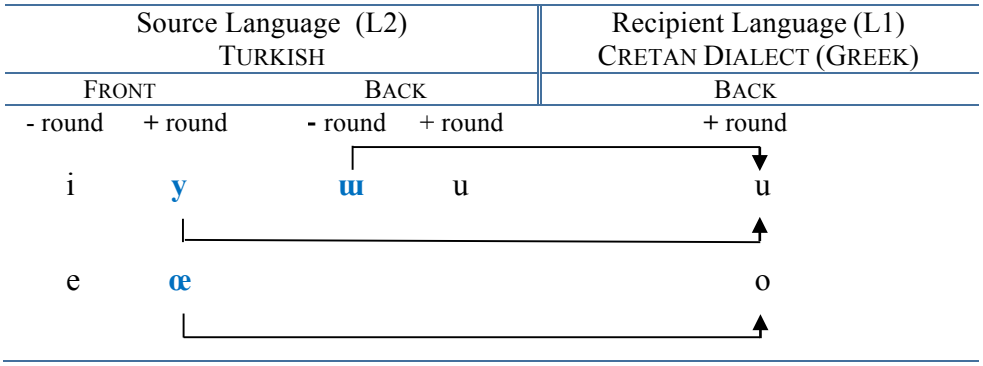

Table 3: *Adaptation of Turkish vowels in Cretan dialect*

Similar vowel adaptations as in (1) and (3) are attested in Aivaliot loanverbs of Turkish origin, for instance from Turkish verbs, e.g. *pysk**y**rt(mek)* 'sprinkle/spray' which is adapted in Aivaliot as *psx**u**rd-iz(u)/psx**u**rd(o)* 'sprinkle' (Ralli 2012: 197), ***fɯ**rla(mak)* is adapted as ***fu**rladizu* 'to burn from anger' (Ralli 2012: 191).

It has to be noted that /ɯ/ being [-round] lacks any strong visual-phonetic cues, contrary to the front, rounded /y/ and /œ/ which have lip-rounding as a strong visual cue. Radisic (2014) in her extensive experimental study (ultrasound and acoustics) on the adaptation of the rounded/unrounded vowels of Turkish loanwords in six genetically different languages, including Albanian, Bulgarian, Greek, Hungarian, Romanian and Serbian, reports that contrary to the more consistent adaptations of /y/ and /œ/ as [u] and [o], respectively, the source /ɯ/ shows in the latter languages the following variable adaptation patterns:

- The source /ɯ/ is realized as [i] in Hungarian.
- For Greek, she does not report the adaptation as [u], she mentions [i] as the only one.
- In Serbian, which has the same 5-vowel system as Greek, the source /ɯ/ is adapted as all native vowels.
- In languages which have high or mid, central unrounded vowels, i.e. /ɨ/ or /ə/ in their system, like Romanian and Albanian, respectively, /ɯ/ may be adapted as a high central [ɨ] (Romanian) and as a mid central [ə] (Albanian).
- In Bulgarian /ɯ/ is adapted as the back, mid, unrounded [ɤ].

Radisic (ibid) reports that /ɯ/ has been found to be the shortest vowel in the Turkish system (p. 55) and she further claims (p. 58) that the adaptation patterns in Romanian, Albanian and Hungarian can be explained with reference to acoustics and perception, namely /ɯ, ɨ, ɤ, ə/ have similar F2 values, 1200-1600 Hz, therefore the Turkish /ɯ/ can be misperceived and it is

[2] Pejorative description for people

adapted variably as an unrounded central [ɨ], [ə] or it can be realized as its acoustically closest back, mid, unrounded vowel [ɤ].

In our corpus there are data which seem to contradict the above repair mechanisms in (1-3), namely the Turkish /ɯ/ exhibits a variable adaptation pattern and it is realized as [i], as in the loanwords below in (4).

	Turkish		Cretan dialect	Gloss
(4)	**[ɯ]**	→	**[i]**	
a.	[katʃɯrma]		[katˢir.má-s]	'smuggling' (Masc. Nom. Sg.)
b.	[hɯrka]		[çir.ká-s]	'cassock, knitted sweater' (Masc. Nom.)
c.	[fɯrka]		[fir.ká-s]	'military division' (Masc. Nom. Sg.)
d.	[ʃaʃɯrma][3]		[ɕaɕir.má-s]	'confusion, discomposure'(Masc. Nom.)
e.	[sakɯn(dɯm)][4]		[sacin-d-íz-ome]	'be aware, be carefull' (Present 1SG.)
			[sacín]	'(it's) forbidden!'
f.	[patɯrdɯ]		[patir.dí]	'loud noise/revelry' (Neu. Nom. Sg.)
g.	[kɯrmɯzɯ]		[cir.mizí]	'red colour' (Neu. Nom. Sg.)
h.	[fɯndɯk]		[fin.dítᵉ-i][5]	'hazelnut' Neu.Nom. Sg.)
i.	[tʃaʃɯt]		[tsasít-is][6]	'spy, traitor' (Masc. Nom. Sg.)
j.	[hazɯr][7]		[xazíri]	'profit without work/effort'(Neu. Nom.
k.	[kaldɯrɯm]		[kaldirím-i]	'pavement' (Neu. Nom. Sg.)
l.	[tʃɯkrɯk]		[tʃikrítᵉ-i]	'tool used to wind yarn'(Neu.Nom. Sg.)
m.	[jastɯk]		[ʒastítᵉ-i]	'pillow' (Neu. Nom. Sg.)

In the above data in (4) the source wordfinal /ɯ/ is realized as [i] due to gender assignment as neuter or masculine (see §3.2 for more details). The vowel adaptations within the word are the result of V-C or C-V interaction, where the constraint AGREE(backness) drives the assimilation between adjacent vowels and consonants (cf. Flemming 2003: 7, 10) and the latter are penalized if they differ in position on backness (Lombardi 1999).

In (4 a-f) the vowel adaptation as [i] occurs due to the V-C interaction, namely the source vowel /ɯ/ is adapted as [i] when followed by a a tautosyllabic sonorant Coronal consonant in coda position. The latter adaptation seems to be consistent in the majority of adapted loanwords with wordmedial sonorant Coronal codas and it seems that the more sonorous the Coronal (i.e. a rhotic) then the more stable the adaptation without variation[8], e.g. in the case of a nasal Coda

[3] Also [sasirmás]. From the Aorist form [ʃaʃɯr(dɯm)] of the turkish verb [ʃaʃɯr(mak)] is created the loanverb [ɕaɕir-d-ízo]~[sasir-d-ízo] 'to be at loss, become upset' (cf. [sasir-d-o] in Aivaliot, Ralli 2012: 195).

[4] Aorist of turkish verb [sakɯn(mak)] 'to be aware'; In Aivaliot it is realized as [sakin-d-o] (Ralli 2012: 195).

[5] The realization [findítᵉ-i], also reported in Orfanos 2014, is also attested during our fieldworks in the Cretan villages with the variable adaptation [fundútᵉ-i].

[6] See also the loanverb [tsasit-év-o] 'spy on, betray' (Present, 1 SG)

[7] See also [xazír-is] 'ready / lazy person who avoids work', [xazir-évɣ-o] 'to make ready', Present 1SG. The latter loanverb is also attested in Aivaliot as [xazir-évɣ-u] (Ralli 2012: 190), where the final inflectional ending is realized as [-u] due to the unstressed vowel raising which is typical in the northern Greek varieties, namely ([-u] < [-o]). In Aivaliot, the loanverbs of Turkish origin are created either from nominal items, e.g. [xazir-évɣ-u] or from the Aorist of verbs (Ralli 2012: 189). At first glance it seems also to be the case in the Cretan dialect and this is an issue for further study.

[8] The vowel adaptation as [u] in the Aivaliot verb ***fu**rladizu* 'to burn from anger' from the Turkish ***fɯ**rla(mak*) (Ralli 2012: 191), seems to contradict the above claim. We assume that [u] may be realized due to the action of the preceding Labial [f]. More data are needed for a detailed investigation.

(4h), which is a less sonorous sonorant Coronal in comparison to a rhotic, a variable adaptation pattern may occur, namely [i] vs. [u] as in [fin.dít^{e}-i] ~ [fun.dút^{e}-i]. If a source word-internal /ɯ/ is adapted as [i], then its [-back] feature can be copied by another source /ɯ/ within the word (4 g, h).

There are also instances of adaptation of /ɯ/ as [i], if it occurs between Coronal consonants, e.g. (4 i, j, k) and then the [-back] feature is copied by another source /ɯ/. It seems that within the word, all adaptated source /ɯ/ have to harmonize to the [±back] feature, as in (4g, h, k). The fronting of vowels conditioned by Coronals is also attested in other languages, e.g. in Cantonese the back vowels are fronted if they occur between Coronal (dental) consonants (Flemming 2003: 13ff).

Finally there are cases of C-V interaction, namely a preceding Coronal consonant conditions the adaptation of /ɯ/ as [i] as in (4 l, m). In Bulgarian the source [ɯ] is also adapted as [i] in the context of a preceding postalveolar consonant (Radisic 2014: 57).

3.2. Vowel adaptations due to gender assignment

The loanwords of Turkish origin are also morphologically adapted, namely through assignment of gender and integration into a specific inflectional class. The latter morphological adaptation has been extensively explored in other greek varieties, e.g. in Aivaliot (Ralli 2012, Ralli et al. 2015), in Pontic (Ralli et al. 2015, Melissaropoulou 2016, among others). For an extensive research on gender assignment in loanwords of Turkish origin, see Kyranoudis (2009).
For the gender assignment in loanwords of Turkish origin operates in Greek a general rule (Table 4) as shown for instance by Ralli et al. (2015) and by Kyranoudis (2009), among others:

- If the source word is [+human] then MASCULINE OR FEMININE in L1 (according to natural gender).
- If the source word is [- human] then NEUTER in L1

Table 3: *Gender assignment in Turkish loanwords in Greek*

The adapted loanwords select among the following inflectional endings for Greek nouns (drawn from Holton, Mackridge & Philippaki Warburton 1999:50ff, see also Ralli 2005):

Masc. Nom. Sg : [-(i)s, -(a)s, -(o)s, -(é)s (in words of foreign origin), –(ú)s (formal speech)]
Fem. Nom. Sg. [-i, -a, -u, -os (formal speech]
Neu. Nom. Sg : [-i /-í , -o, -ma, -imo, -as (rare), -os and –n (formal speech]

There are cases of [-human] Turkish words ending in [-é] and [-á] which deviate the general rule of gender assignment "if [+human] then MASCULINE OR FEMININE in L1". The latter words may be adapted as Masculine ending in [-és], e.g. [syrme]→[surmés] 'bolt (on the door)' (1f), [cœfte]→[coftés]~ [t^{e}oftés] 'meatball' (2b), and Feminine or Masculine ending in [-á(s)], e.g. [dyɲa] → [duɲás] 'world'(Masc.Nom. Sg.) (1c) (for a detailed description see Kyranoudis 2009: 96ff). In (5), (6), (7) follow representative examples with morphological adaptation for gender.

(5)	Turkish	Cretan dialect	Gloss
		MASCULINE Nouns	
a.	[mysteri]	[musterí-s]	client / buyer (Nom. Sg)
b.	[dynja]	[duɲá-s]	people / world (Nom. Sg)
c.	[syrme]	[surmé-s]	bolt (on the door) (Nom. Sg)
d.	[cœr]	[cór-os]~[t^{e}ór-os]	squint-eyed (ADJ. Masc. Nom. Sg)

e.	[dykandᶻɯ]	[ducanidʒí-s]	shopkeeper (Nom. Sg.)
f.	[zardʒɯ]	[zar(i)dʒí-s]	crapshooter (Nom. Sg.)

The above adapted loanwords as masculine nouns/adjectives in (5) select the following endings:

a) The ending {-s} is selected, if the source noun ends in a vowel [i, a, e] as in the data (5 a, b, c), due to *phonological similarity* with the native endings (see Ralli 2012, Ralli et. al. 2015, Melissaropoulou 2016).
b) The inflectional ending {-os} is selected in masc. adjectives, if the source noun ends in a consonant (5d).
c) The inflectional ending {-is} is selected, if the source noun ends in [ɯ] (5 e, f). The source vowel [ɯ] is not realized as [u], according to the Greek phonological constraint [α back, α round]).

(6)	Turkish	Cretan dialect	Gloss
		FEMININE Nouns	
a.	[dʒamɯs]	[dʒamúz-a]	buffalo (Nom. Sg., pejorative description)
b.	[ɟœtʃ]	[jóts-a]~[ʒóts-a][9]	disaster (Nom. Sg.)
c.	[syrykleme]	[suruklemé][10]	sloven, lightsome (Nom. Sg)
d.	[zardʒɯ]	[zardʒú]	crapshooter (Nom. Sg.)

In the above adapted loanwords as feminine nouns in (6) are attested the following ending selections:

a) Loanwords ending in a consonant select the inflectional ending {-a} as in (6a, b).
b) If the source word (stem) ends in a vowel acceptable in Greek, then it is preserved, e.g. [e] in (6c).
c) If the source word (stem) vowel bears a non-acceptable feature combination, e.g. [+back, -round]: [ɯ] as in (6d), then it is repaired according to the [α back, α round] phonological constraint of Greek and it is realized as [u]:[+back, +round]. The realized [u] is an acceptable ending for fem. nouns and describes a profession or it is an inflectional suffix for the derivation of fem. nouns, e.g. [ɣalat-ú] 'woman delivering/selling milk' (see Ralli 2005:160, 152, respectively).

(7)	Turkish	Cretan dialect	Gloss
		NEUTER Nouns	
a.	[mylk]	[mulc-i]	estate (Nom. Sg.)
b.	[dykan]	[ducan-i]	shop (Nom. Sg.)
c.	[dydyk]	[dudútᵉ-i]	rumor (Nom. Sg.)
d.	[synɟy]	[suɟí]	bayonet (Nom. Sg.)
e.	[japɯ]	[japí]	skeleton building (Nom. Sg.)

The adapted loanwords as neuter nouns above in (7) select the inflectional ending {-i}, which is the default ending for loanwords of neuter gender (e.g. Kyranoudis 2009; Ralli 2015). Specifically:

[9] The adaptation as [jótsa] is attested during our fieldworks and alternates phonetically with the output [ʒótsa], which is also attested by Orfanos (2014: 103).

[10] In the Cretan dialect the Turkish loanword [syrykleme] is used mainly as the feminine noun [suruklemé]. The masculine noun [suruklemés] 'sloven, lightsome, bum' is rarely used (Orfanos 2014: 417). For the Turkish loanwords ending in {-lemé(s), see Kyranoudis (2009: 487).

a) if the source noun ends in a consonant, then it selects the inflectional ending {-i} as in the data (7 a, b, c).
b) if the source (stem) noun ends in [y] (7d), or in [ɯ] (7e), then it is also adapted with the inflectional ending {-i}. The latter adaptation of the source vowels [y] and [ɯ] does not conform to the phonological ones described above for the data (1-3). In this case the morphological constraints override the phonological ones described above, namely the phonological changes that occur in (7d) and (7e) are morphologically driven. Specifically, the source vowel [y]: [(+high), -back, +round] changes the [+round] feature to [-round] and it is realized as [i] in (7d); the source vowel [ɯ]: [(+high),+back, -round] changes the [+back] feature to [-back] and it is also realized as [i] in (7e).

3.3. Residual issue: Preservation of source palatalization

The Turkish dorsal segments /k, g/ are palatalized in the environment of a following front vowel [i, y, e, œ] (like the Greek obligatory palatalization rule of Dorsals). In (8) below are given representative adapted loanwords with (source) palatalized stops and their realisation in the Cretan dialect (L1) as palatalized stops (8a), as stops ~ affricates (8b, c) and as palatalized fricatives (8d).

(8)	Turkish	Cretan dialect	Gloss
a.	[cyp]	[cup-i]	pot (Neu. Nom. Sg)
b.	[cœr]	[cór-os]~[c^{ɕ}óros]~[t^{ɕ}óros]	squint-eyed (ADJ.Masc.Nom. Sg
c.	[cœfte]	[cofté-s]~[c^{ɕ}oftés]~[t^{ɕ}oftés]	meatball (Masc. Nom. Sg)
d.	[ɟœtʃ]	[ɟóts-a]~[ʒótsa]	death / disaster (Fem. Nom. Sg)

The adapted loanwords above in (8) preserve the source palatalized segments, despite the fact that, due to the vowel repair, the proper vocalic environment, i.e. a [+front] vowel, does not exist anymore. The latter preservation of source palatalized segments is also attested in the Cappadocian dialect of Mistí, e.g. the adopted Turkish loanword *kütük* "log" is realized as [**c**utútš] (Janse 2009:40).

The above source palatalized dorsal stops in (8) are not only adapted as palatalized ones, but due to the dialect specific rules (Lengeris & Kappa 2016) they may also surface with their palatal and/or alveolo-palatal affricate allophones [c^{ɕ}], [t^{ɕ}] respectively, e.g. in (8b) and (8c), or undergo frication, e.g. (8d).

3.4. Concluding discussion

The above adapted loanwords in (1-8) show the following properties:

i. All loanwords preserve the stress on the source syllable.

ii. The change of the source vowels is a categorical/phonemic one.

iii. The ill-formed structures, in this case the source vowels /y, œ, ɯ/, are *minimally* repaired (i.e. only one change occurs) by the Greek structural constraint [α back, α round] in accordance with the *Preservation Principle* (Paradis & LaCharité 1997). The dialect is 'looking" for the *closest phonological* match for the adaptation of the illicit source vowels with the minimum of changes in accordance with the '*Category Proximity Principle'* (LaCharité & Paradis, 2005:228). Therefore we assume that phonological factors influence the vowel adaptation.

iv. The [±high] feature of source vowels is faithfully preserved in the Cretan dialect (L1), namely the source high vowels /y, ɯ/ and the mid [œ] are adapted as high [u] and mid [o], respectively. The source vowels /y, œ/ also preserve their [+round] feature at the expense of their [-back] feature. Specifically, due to the Greek structural phonological constraint [α back, α round], the source [-back] feature is delinked and it is realized by default the [+back] one which is associated to the [+round] vowel. The source vowel /ɯ/ also seems to be adapted by default as a [+back] one.

v. The source /ɯ/ may also be variably adapted as [i] (within the word) as a result of V-C or C-V interaction, where the constraint AGREE(backness) drives the assimilation between adjacent vowels and consonants.

vi. The adapted loanwords preserve the palatalized source segments, even if the proper vocalic environment of a following [+front] vowel is not present anymore, e.g. [ɟœtʃ]→ [ɟóts-a] 'disaster', [gœl]→[ɟól-i] 'lake/soaking wet', [cyp]→[cup-i] 'pot'. We claim that the (phonetic) output-segments from the source language (Turkish) may serve as input-segments to Cretan phonology, if they are licit sounds in the native system. We assume that in the Cretan dialect the borrowers interprete the (source) underlying structure of the (source) palatalized dorsal segment as a sequence of a [Dorsal, $\text{Vowel}_{[+\text{front}]}$] and this is also reflected in the greek orthography of the loanwords. Our data provide evidence in favor of the stance that the loanword input to the phonology of L1 is immediately interpreted as a phonological representation by L1, and handled by its constraint set (Paradis & LaCharité 1997).

vii. The loanwords are also morphologically adapted, namely they conform to the requirements of the Greek system for gender assignment and integration into specific inflectional classes.

- The adaptation of the source vowels [y, œ, ɯ] is position-dependent:
  - If the source vowel is word-internally then its adaptation is driven by the phonological constraints of Greek.
  - If the source vowel is in word-final position, then its adaptation is driven by the morphological constraints for gender assignment in Greek, which override the phonological ones.

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