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ON THE SYNCHRONIC STATUS OF PALATALIZATION IN POLISH

Introduction

Palatalization is a set of several complex and interrelated phenomena which, together with mobile vowels, known as yers, constitute the core of Polish phonology. It is, in large simplification, manifested in numerous alternations between unpalatalized or 'hard' and palatalized or 'soft' consonants, where the latter appear in the context of the following front vowels (i.e. /e/ and /i/) and the palatal glide /j/ while the former elsewhere.¹

Palatalization is attested in thousands of native Polish words, e.g.:

- (1) ko[s]a 'scythe, noun' – ko[ś]ić 'to scythe'
to[m] 'volume' – to[m']ik 'id. dim.'
ra[n]a 'wound, noun' – ra[ń]ić 'to wound'
ko[t] 'cat' – ko[ć]ina 'id. dim.'

as well as in borrowings, including the most recent ones such as, for instance, proper nouns:

- (2) Schrøde[r] – Schrøde[•]je Puti[n] – Puti[ń]e
Kucz[m]a – Kucz[m']je Łukaszen[k]a – Łukaszen[k']j

Its reflexes can be seen inside single words (1 and 2) and in phrases (3), e.g.:

- (3) ku[p] 'buy, imper.' – ku[p'] i]gły 'buy some needles'
ko[t] 'cat' – ko[t' i] pies 'cat and dog'
my[•]] 'mouse' – my[• ' i]reny 'Irena's mouse'
ra[s] 'once' – ra[s' j]eszcze 'once again'
ja[k] 'as' – ja[k' j]a 'as I'

¹ As a matter of fact, palatalization phenomena also involve alternations of phonetically hard consonants, e.g.:

ro[g]u 'horn, gen. sg.' – ro[•]]ek 'id. dim. sg.' wia[r]a 'faith' – wie[•]]yc 'to believe'.

The complexity of palatalization phenomena in Polish, which escape any straightforward description and explanation and are rife with irregularities, present a challenge to any model of phonology and constitute an excellent testing ground for competing phonological theories. It comes therefore as no surprise that Polish palatalizations have been analysed in numerous generative studies and approached from a variety of theoretical perspectives, e.g. Steele (1973), Laskowski (1975), Gussmann (1978, 1980, 1992, 1997), Rubach (1984), Czaykowska-Higgins (1988), Spencer (1988), Bethin (1992), Szpyra (1995).

Controversies around palatalizations are numerous; they concern the synchronic status of the phenomenon in question, the number and types of palatalization rules, their formal characterization and mode of application (cyclic versus noncyclic), their interaction with the rest of Polish phonology, the treatment of exceptions to it, etc.

In this paper I will concentrate on what I consider one of the most important issues, without the settling of which no analysis can proceed any further, i.e. the synchronic status of palatalization. In other words, we will address the question whether the phenomenon under investigation is phonological, morphologized or lexical in nature.

Problems with palatalization

The examples provided in section 1 seem to imply that palatalization in Polish is a phonetically motivated phenomenon, which is triggered by the presence of front vowels and the palatal glide. This is, however, a considerable simplification since the facts are much more complicated.

Thus, as all researchers dealing with palatalization point out, there are numerous items in which consonants fail to be softened in a typically palatalizing context, i.e. before front vowels. This is true of both morpheme-internal ‘consonant plus vowel’ sequences, e.g.:

- (4) [re][ne]sans ‘Renaissance’ ko[ne][se]r ‘connoisseur’
 [be]ksa ‘cry-baby’ [ge][ne]rał ‘general’

as well as in the case of morpheme concatenation, e.g.:

- (5) dob[r]y ‘good, nom. sg. masc.’ – dob[r]-e ‘id, nom. pl. nonmasc.’ la[t]o
 ‘summer’ – la[t]-em ‘in summer’
 pięk[n]y ‘beautiful, nom. sg. masc.’ – pięk[n]-ego ‘id. gen. sg.’

Secondly, the softening of consonants can often be observed in what phonetically are nonpalatalizing environments, i.e. before suffixes with initial nonfront vowels, i.e. /a/, /o/ and /u/, e.g.:

- (6) sło[m]a ‘straw, noun’ – sło[m’]any ‘id. adjective’
 s[p]ać ‘sleep’ – ś[p’]ioch ‘sleepyhead’
 kró[t]ki ‘short’ – kró[ć]iutki ‘id. dim.’
 ka[s]a ‘safe’ – ka[ś]arz ‘safe-breaker’

before (phonetically) consonant-initial suffixes, as in (7):

- (7) papiero[s] ‘cigarette’ – papiero[ś]nica ‘cigarette holder’
 wi[n]o ‘wine’ – wi[ń]sko ‘id. augment.’
 gro[z]a ‘horror’ – gro[ź]ny ‘dangerous’
 diabe[w] ‘devil’ – diabe[l]ski ‘devilish’

and word-finally, e.g.:

- (8) pamię[t]ać ‘remember’ – pamię[ć] ‘memory’
 nio[s]ę ‘I carry’ – nie[ś] ‘id. imperat.’
 czar[n]y ‘black’ – czer[ń] ‘blackness’
 tłus[t]y ‘fat, adj.’ – tłusz[●] ‘fat, noun’

Finally, some morphologically identical suffixes appear to have variable palatalizing effects in that the change in question does take place on the attachment of some of them, but not with the other ones, e.g.:

- (9)
-aty łą[t]a ‘patch’ – łą[ć]aty ‘id. adj.’
 bro[d]a ‘beard’ – bro[d]aty ‘id. adj.’

-anin Gdańs[k] ‘name of town’ – gdańsz[č]anin ‘inhabitant of Gdańsk’
 Korsy[k]a ‘Corsica’ – korsy[k]anin ‘Corsican’

-uch kłam[c]a ‘liar’ – kłam[č]uch ‘id. derog.’
 pie[c] ‘oven’ – pie[c]uch ‘milksoop, derog.’

The well-known facts enumerated above clearly indicate that palatalization in Polish is not a regular, phonetically conditioned and transparent phenomenon, but one that is characterized by a considerable degree of complexity and, as such, it lends itself to a variety of different interpretations.

Major views on the status of palatalization

Generally, three types of views on the status of palatalization can be found in the literature. In the classical generative framework (e.g. Steele 1973, Laskowski 1975, Gussmann 1978, 1980) palatalization is viewed as a phonologically motivated process triggered by [-back] segments. Consequently, a variety of procedures are employed to account for special

cases, such as those in (4), (5), (6), (7), (8) and (9), all of which involve positing abstract phonological representations. Thus, in the instances of palatalization before consonant-initial suffixes and word-finally, as well as lack of palatalization before some front-vowel suffixes, underlying abstract vowels (both palatalizing and nonpalatalizing), known as yers, are introduced to be later removed in the course of derivation. For the problematic examples in (6) underlying front vowels are posited, which trigger palatalization to be later retracted. To handle the failure of palatalization in (5), other abstract vowels are postulated (e.g. nonpalatalizing, phonetically nonexistent back unrounded vowels) as well as rules of /e/-epenthesis ordered after the operation of palatalization (e.g. in Rubach 1984). Finally, lexical marking is used and claims of exceptionality are made on the ground of foreignness of the items in (4).

As Gussmann (1992:19) correctly observes, *analyses along these lines are forced to move away from phonetic substance and resort to an ever increasing abstractness, a step that would be described as regrettable but necessary*. This realization meant, in consequence, that in subsequent analyses of palatalization an attempt has been made to curb what has been felt as an excessive degree of abstractness. A move in this direction was Rubach's (1984) description of Polish phonology within the cyclic/lexical model; through regarding the majority of palatalization rules as strictly cyclic, their failure to affect morpheme-internal sequences of hard consonants and front vowels in (4) has ceased to be problematic. This has not changed, however, the questionable character of the remaining cases.

More recently the status of Polish palatalizations as a phonologically motivated processes has been questioned. Czaykowska-Higgins (1988), for instance, argues that palatalizations should be regarded as phonological rules but with morphological conditioning. This means that rules of palatalization are placed among other phonological processes, but are triggered not by any single phonological segment or feature (i.e. frontness), but by some affixes lexically marked as palatalizing. Thus, she assumes that palatalization rules do not refer to the presence of front vowels and glides, but comprise a list of suffixes which induce the changes in question. She also claims that roots are lexically marked as to whether they undergo palatalization processes or not. Gussmann (1992) takes a somewhat similar stand by regarding palatalizations as phonological processes which are not, however, dependent on the phonetic frontness of the following segments, but rather on the presence of lexically preassigned (to some vowels as well as to whole affixes) and autosegmentalized palatalizing features. To put it differently, in Gussmann's analysis while it is technically still the feature [-back] which triggers palatalization, its occurrence in phonological structure is morphologically determined.

Spencer (1986, 1988) has argued that Polish has no phonological palatalization rules at all: according to him the lexicon contains a list of allomorphs with both palatalized and unpalatalized consonants which are related by means of morpholexical rules. Affixes are marked with respect to whether they should select palatalized or unpalatalized stem allomorphs before the operation of phonological rules proper. This amounts to claiming that there is no principled connection between palatalization and the frontness/backness of the following segment. Also according to Gussmann (1997:210), *such alternations* (between ‘hard’ and ‘soft’ consonants’ – J. Sz-K) *are a matter for the lexicon or morphology and have no place in phonology*. The latter view means, in fact, a return to the structural approach with its division into morphophonemics and phonemics, and palatalization phenomena assigned to the former, as the title of Gussmann’s paper (‘Polish palatalizations return to the fold’) clearly indicates.

Thus, three views of palatalization have been offered in the description of Polish, with two extreme approaches (‘all instances of palatalization are phonologically regular’ versus ‘palatalizations remain outside phonology’) and a moderate one (‘some cases of palatalization are phonological in nature, some are morphologized’). The first of them, according to which palatalizations are phonologically motivated processes, emphasises the importance of regular cases of consonant softening before front vowels and /j/, and devises some methods of handling the examples that violate this pattern. The descriptions which regard palatalization as a partly phonological and partly morphologized phenomenon, point to the regular instances, but also attempt to handle the problematic cases. Finally, the analyses which deny the synchronic status of palatalization altogether and treat it as a lexical issue concentrate on the unpredictable aspects of this phenomenon and disregard the large body of data in which consonant softening is fully regular and productive.

As I have argued in Szpyra (1995), there seems to be a great deal of truth in all these views on palatalization. On the one hand, the number of exceptions and irregularities does not allow us to view palatalization as a purely phonological phenomenon. On the other hand, its productivity is unquestionable; it is attested in thousands of words, both in native vocabulary and in quite recent borrowings, which does suggest its synchronic phonological status.

In this paper I intend to argue that the two extreme views on palatalization should be rejected in favour of an intermediate, more moderate approach. More specifically, I would like to suggest that a distinction should be made between two cases: those in which some degree of morphologization and lexical marking is undoubtedly required and instances of genuine phonetically motivated palatalization. The former, illustrated in (6), (7), (8) and (9), can be dealt with in a number of ways which, as less interesting, will not be discussed here (for possible solutions, see Szpyra 1995). The latter comprise, without any doubt, Phrase-level Palatalization (also known as Surface Palatalization), which is fully

automatic and exceptionless, and the softening of consonants before the high front vowel /i/ and the palatal glide /j/.²

In order to support this statement in what follows I examine the palatalizing properties of suffixes which begin with the front vowels /i/ and /e/.

/i/-initial suffixes

In the preceding section a claim has been made that palatalization is a phonetically motivated phenomenon only in the context of /i/ and /j/. In the remaining instances it is morphologized. The major argument in favour of this position is the fact that while in other cases palatalization sometimes does and sometimes does not take place, before /i/ and /j/ consonants are invariably subject to softening.³

Below we list representative examples with palatalization before the suffixes beginning with /i/:

(10)

<u>-ić</u>	pla[m]a ‘spot’ – pla[m’]ić ‘to stain’
<u>-izować</u>	ekra[n] ‘screen’ – ekra[ń]izować ‘to screen’
<u>-ik</u>	skle[p] ‘shop’ – skle[p’]ik ‘id. dim.’
<u>-ika</u>	fotogra[f]ować ‘to take pictures’ – fotogra[f’]ika ‘photography’
<u>-iczka</u>	ro[s]a ‘dew’ – ro[ś]iczka ‘sundew’
<u>-ic</u>	szlach[t]a ‘gentry’ – szlach[ć]ic ‘nobleman’
<u>-iciel</u>	gwał[t] ‘rape’ – gwał[ć]iciel ‘rapist’
<u>-icz</u>	oboza[v]y ‘camp, adj.’ – oboza[v’]icz ‘camper’
<u>-ica</u>	szympan[s] ‘male chimpanzee’ – szympan[ś]ica ‘female chimpanzee’
<u>-ic</u>	Cyga[n] ‘Gypsy man’ – Cyga[ń]icha ‘Gypsy woman, pejor.’
<u>-izna</u>	si[v]y ‘grey’ – si[v’]izna ‘grey hair’
<u>-itwa</u>	ry[b]a ‘fish’ – ry[b’]itwa ‘sea swallow’
<u>-ina</u>	gaz[d]a ‘mountain farmer’ – gaź[dź]ina ‘id. fem.’
<u>-inek</u>	bia[w]y ‘white’ – bie[l’]inek ‘cabbage butterfly’
<u>-inka</u>	kre[f] ‘blood’ – kr[f’]inka ‘blood corpuscle’
<u>-iny</u>	wło[s]y ‘hair’ – wło[ś]iny ‘id. express.’
<u>-iniec</u>	siero[t]a ‘orphan’ – siero[ć]iniec ‘orphanage’
<u>-ista</u>	fle[t] ‘flute’ – fle[ć]ista ‘flutist’
<u>-istek</u>	rze[ś]a ‘eye-brow’ – rze[ś]istek ‘Trichomonas’
<u>-izm</u>	ra[s]a ‘race’ – ra[ś]izm ‘racism’

² Palatalization before the palatal glide will not be discussed here as it requires an investigation into an extremely complex issue of Polish verb structure.

³ In some lexically marked borrowings /i/ triggers only Surface Palatalization, e.g.: [t’i]k ‘tic’, [d’i]nar ‘dinar’, [s’i]nus ‘sinus’.

<u>-idło</u>	malo[v]ać ‘paint’ – malo[v’]idło ‘picture, augmen.’
<u>-isko</u>	pie[s] ‘dog’ – p[ś]isko ‘id. augment.’
<u>-iś/-isia</u>	mod[n]y ‘trendy’ – mod[ń]iś ‘dandy’
<u>-isz</u>	złot[y] ‘zloty’ – złot[ć]isz ‘id. express.’
<u>-iszek</u>	bra[t] ‘brother’ – bra[ć]iszek ‘id. dim.’
<u>-iszon</u>	mał[p]a ‘monkey’ – mał[p’]iszon ‘id. express.’
<u>-iszczę</u>	do[m] ‘house’ – do[m’]iszczę ‘id. pejor.’
<u>-iwo</u>	mię[s]o ‘meat’ – mię[ś]iwo ‘id. express.’
<u>-isty</u>	świat[w]o ‘light’ – świet[l’]isty ‘bright’
<u>-iwy</u>	uro[d]a ‘beauty’ – uro[dź]iwy ‘good-looking, masc.’
<u>-in</u>	Lit[f]a ‘Lithuania’ – Lit[f’]in ‘Lithuanian’
<u>-in(y)</u>	ma[m]a ‘mother’ – ma[m’]iny ‘id. adj.’
<u>-iny</u>	ślu[b]y ‘vows’ – zaślu[b’]iny ‘wedding’
<u>-ini</u>	dozor[c]a ‘janitor’ – dozor[●] jny ‘id. fem.’
<u>-iński</u>	głupta[s] ‘silly’ – głupta[ś]iński ‘id. express.’
<u>-icki</u>	wygod[n]y ‘fond of ease’ – wygod[ń]icki ‘id. express.’
<u>-ictwo</u>	szkol[n]y ‘school, adj.’ – szkol[ń]ictwo ‘educational system’
<u>-i</u>	no[v]a ‘new, nom. sg. fem.’ – no[v’]i ‘id. nom. pl. masc.’

These examples demonstrate that about 40 /i/-initial suffixes trigger palatalization in a regular and systematic fashion, which requires a principled treatment in an adequate phonological description of Polish.⁴ In other words, in these instances there is no justification to regard palatalization as a morphologized or lexicalized phenomenon.

/e/-initial suffixes

Let us now consider the other front vowel, i.e. /e/ and its effect upon the preceding consonants. The usual assumption (e.g. Rubach 1984) is that /e/-initial suffixes trigger palatalization and those instances in which this does not happen are irregular and should be handled in some way. In other words, if we consider minimal pairs in (11),

- (11) ład[n]-e ‘pretty, nom. pl. nonmasc.’ – ład[ń]-e ‘id. adv.’
dob[r]-e ‘good, nom. pl. nonmasc.’ – dob[●] je ‘well’

⁴ It should be added that some of them have non-palatalizing /y/-initial allomorphs, eg.:

-izm/-yzm ra[ś]izm ‘racism’ – solip[s]yzm ‘solipsism’
-ista/-ysta rekor[dź]ista ‘record holder’ – meto[d]ysta ‘methodist’

Cases like these are, however, very infrequent and usually involve borrowings. Hence, they can be regarded as marginal.

z[w]-e ‘bad, nom. pl. nonmasc.’ – ź[l]-e ‘badly’

we can observe two phonetically identical *-e* suffixes one of which is palatalizing and the other one which is not. The former is generally viewed as a regular case, the latter as irregular.

A more detailed scrutiny of the relevant facts demonstrates, however, that this conclusion is unjustified as the number of nonpalatalizing /e/-initial suffixes considerably exceeds those ones in which softening does occur. In (12) we list 15 palatalization-triggering /e/-initial suffixes:

(12)

<i>-ec</i>	sta[r]y ‘old’ – sta[●]ec ‘old man’
<i>-eniec</i>	mło[d]y ‘young’ – mło[dź]eniec ‘young man’
<i>-enica</i>	siost[r]a ‘sister’ – siost[●]enica ‘niece’
<i>-eź</i>	mło[d]y ‘young’ – mło[dź]ieź ‘youth’
<i>-eń</i>	wło[s]y ‘hair’ – wło[ś]eń ‘trichina’
<i>-eństwo</i>	wdo[v]a ‘widow’ – wdo[v]ieństwo ‘widowhood’
<i>-el</i>	tor[b]a ‘bag’ – tor[b’]iel ‘cyst’
<i>-elec</i>	chu[d]y ‘thin’ – chu[dź]ielec ‘scrag’
<i>-elny</i>	chrzes[t] ‘baptism’ – chrz[ć]ielny ‘baptismal’
<i>-enie</i>	dziecin[n]y ‘childish’ – zdziecin[ń]ienie ‘dotage’
<i>-ej(szy)</i>	ład[n]y ‘nice’ – ład[ń]iej(szy) ‘nicer’
<i>-ech</i>	Węg[r]y ‘Hungary’ – na Węg[●]ech ‘in Hungary’
<i>-e (adverbial)</i>	śmiesz[n]y ‘funny’ – smiesz[ń]ie ‘id. adv.’
<i>-e (loc. sg.)</i>	ko[t] ‘cat’ – ko[ć]ie ‘id. loc. sg.’
<i>-e (voc. sg.)</i>	mro[z]y ‘frost, nom. pl.’ – mro[ź]ie ‘id. voc. sg.’

Let us add that many of these suffixes are very productive, particularly the inflectional desinences, which results in the emergence of numerous forms with palatalized consonants.

No palatalization before /e/-initial suffixes takes place before the following 22 /e/-initial suffixes:⁵

(13)

<i>-erca</i>	mor[d]ować ‘murder’ – mor[d]erca ‘murderer’
<i>-elnia</i>	pus[t]y ‘empty’ – pus[t]elnia ‘hermitage’
<i>-elnik</i>	czy[t]ać ‘read’ – czy[t]elnik ‘reader’
<i>-ewiczca[r]</i>	‘tsar’ – ca[r]ewicz ‘tsarevich’

⁵ Some /e/-initial suffixes bring about palatalization in some instances, but not in the others, eg.:

<i>-ek</i>	do[m] ‘house’ – do[m]ek ‘id. dim.’ (domki ‘id. nom. pl.’)
	me[x] ‘moss’ – me[●]ek ‘id. dim.’ (meszkiem ‘id. instr. sg.’)

It should be noted, however, that we are dealing here with the mobile [e] vowel.

<u>-eniek</u>	sy[n] ‘son’ – sy[n]eniek ‘id. dim.’
<u>-eńka</u>	ma[t]ka ‘mother’ – ma[t]eńka ‘id. dim.’
<u>-eńko</u>	cu[d]o ‘wonder’ – cu[d]eńko ‘id. dim.’
<u>-etka</u>	szampo[n] ‘shampoo’ – szampo[n]etka ‘shampoo bag’
<u>-er</u>	tre[n]ować ‘train’ – tre[n]er ‘coach’
<u>-eria</u>	Cyga[n] ‘Gypsy’ – cyga[n]eria ‘Bohemia’
<u>-erstwo</u>	wirtuo[z]a ‘virtuoso, gen. sg.’ – wirtuo[z]erstwo ‘virtuosity’
<u>-erka</u>	łobu[z]y ‘hooligans’ – łobu[z]erka ‘roguery’
<u>-eska</u>	humo[r] ‘humour’ – humo[r]eska ‘humorous story’
<u>-ent</u>	korespon[d]ować ‘correspond’ – korespon[d]ent ‘correspondent’
<u>-encja</u>	konfe[r]ować ‘to hold a conference’ – konfe[r]encja ‘conference’
<u>-e</u> (nom. pl. nonmasc.adj.)	ład[n]a ‘pretty, nom. sg.’ – ład[n]e ‘id. nom. pl.’
<u>-ego</u> (gen. sg. masc. adj.)	chu[d]y ‘thin, nom. sg.’ – chu[d]ego ‘id. gen. sg.’
<u>-emu</u> (dat. sg. masc. adj.)	gru[b]y ‘fat, nom. sg.’ – gru[b]emu ‘id. dat. sg.’
<u>-ej</u> (dat. sg. fem. adj.)	dob[r]a ‘good, nom. sg.’ – dob[r]ej ‘id. dat. sg.’
<u>-em</u> (instr. sg. masc. noun)	ko[t] ‘cat, nom. sg.’ – ko[t]em ‘id. instr. sg.’
<u>-em</u> (1 st p. sg. masc.)	jad[w] ‘he (masc.) ate’ – jad[w]em ‘I (masc.) ate’
<u>-eś</u> (2 nd p. sg. masc.)	pi[w] ‘he (masc.) drank’ – pi[w]eś ‘I (masc.) drank’

As in the previously discussed case, the productivity of many of the above suffixes is unquestionable; note that seven formatives are inflectional.

The conclusion seems clear: as there are considerably more instances of nonpalatalizing /e/-initial suffixes than the palatalizing ones, in this context the lack of softening appears to be a norm rather than a deviation from it. Thus, it can be claimed that generally /e/ has lost its palatalizing power. This is evident particularly in the case of foreign suffixes, e.g. -eska, -etka, -ent, -encja, -er, -eria, all of which are uniformly non-palatalizing e.g.:

(14)

bok[s] ‘box’ – bok[s]er ‘boxer’
tre[s]jura ‘taming (of wild animals)’ – tre[s]jer ‘tamer’
tre[n]ować ‘to train’ – tre[n]er ‘trainer, coach’

This means that /e/-initial suffixes which trigger softening must be lexically marked as having this effect, just like /a/-initial, /o/-initial and /u/-initial formatives which behave in a similar fashion.

With this conclusion, two further sets of facts cease to be problematic: numerous instances of morpheme-internal ‘unpalatalized consonants plus /e/’ sequences, e.g.:

(15)

t[re][ne]r ‘coach’ [be][re]t ‘beret’ [se]k[re]t ‘secret’ [ge][ne]rał ‘general’

and a frequent failure of the nasal vowel –ɛ to trigger palatalization, e.g.:

(16)

i[d]ɛ ‘I go’ mor[d]ɛga rɛ[k]ɛ ‘hand, gen. sg.’

Under the assumption that the front mid vowel is no longer a palatalizer, these cases need no longer be regarded as exceptions to palatalization. Moreover, no complicated mechanisms need to be introduced in order to handle them.

Conclusion

To conclude, there is a sharp contrast between the /i/-initial and /j/-initial suffixes, before which softening always takes place and other environments, including the other front vowel, i.e. /e/, where no such regularity can be observed. The claim therefore is that only in the former context palatalization is fully regular and constitutes a part of synchronic phonology of Polish, while in other instances it should be viewed as morphologized. This view finds further support in the phonetic facts pertaining to the articulation of palatal and palatalized consonants: they are pronounced with two articulatory gestures: fronting of the tongue body and raising its front part towards the hard palate. This, in terms of distinctive features, means the spreading of [-back] and [+high], which are exactly the features of /i/ and /j/.

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