Paweł Rydzewski

University of Warsaw

A Polish Argument for the Underlying Status of [ɨ]

Abstract

This article argues against the single-phoneme approach discussed in Padgett (2001, 2003, 2010), which does not recognize the phonemic status of the vowel [ɨ]. The relevant data are drawn from the processes of Polish palatalization in the class of velars, while the presented analyses are couched in the theory of Lexical Phonology. It is argued that the lack of [ɨ] enforces the use of diacritics and leads to the proliferation of rules that are necessary to accommodate diacritically-specified contexts of palatalization. It is also shown that the single-phoneme approach leads to the morphologization of processes that are typically phonological. On the other hand, assuming the existence of underlying [ɨ] allows for a transparent and uniform account of palatalization effects.

Keywords

palatalization, velar consonants, Polish phonology, Lexical Phonology, derivations, diacritics

Streszczenie

Niniejszy artykuł kwestionuje założenie jednofonemiczne według Padgetta (2001, 2003, 2010), które nie uznaje fonemicznego statusu samogłoski [ɨ]. Przedstawione dane zaczerpnięte są z języka polskiego, a ich analiza opiera się na procesach palatalizacji samogłosek tylnojęzykowych, które dla celów opisowych osadzone zostały w teorii Fonologii Leksykalnej. Artykuł ukazuje, iż obecność [ɨ] w reprezentacji głębokiej umożliwia transparentną i jednolitą analizę palatalizacji spółgłosek tylnojęzykowych, podczas gdy brak [ɨ] wymusza użycie diakrytyków oraz prowadzi do nadmiernego powielania reguł. Ponadto artykuł pokazuje, że założenie jednofonemiczne prowadzi do morfologizacji procesów, które są typowo fonologiczne.

Słowa kluczowe

palatalizacja, spółgłoski tylnojęzykowe, fonologia polska, Fonologia Leksykalna, derywacje, diakrytyki

This article* is organized as follows. Section 1 outlines segment inventories of Polish, focusing on its vowels and velar segments, and discusses palatalization

---

processes that affect the latter. In addition, the last parts of the section are devoted to the description of Polish masculine plural nouns. Section 2 discusses the single-phoneme approach *qua* Padgett (2001, 2003, 2010) and reviews the arguments which favor the lack of the underlying [i]. Section 3 is a single-phoneme re-analysis of the data and rules discussed in Section 2. It is argued that the single-phoneme approach is inferior to the approach that recognizes the underlying status of [i], as the lack of [i] entails an extensive use of diacritics and results in the proliferation of rules. Section 4 focuses on the principles of Lexical Phonology and re-analyzes the processes involving Polish velars under the assumption that [i] is an underlying segment. Section 5 offers the conclusions.

1. Background

This section provides selective descriptive generalizations about Polish. Section 1.1 looks at Polish vowels and velar consonants. Section 1.2 presents palatalization processes that affect velar segments. Section 1.3 discusses morphological composition of masculine plural nouns that is relevant for the analysis of Polish palatalization.

1.1. Sound inventories

Polish vocalic inventory comprises six segments. Apart from the widely attested five vowels, [a ɛ ɔ u i], Polish has a sixth segment, [i], spelled *y*. The segment exhibits phonological properties that are similar to those of back vowels, for instance [u], as it cannot trigger palatalization effects. Thus, past literature on Polish phonology recognizes [i] as being, uncontroversially, [+back] (Gussmann 1980; Rubach 1984; Wierzchowska 1963, 1971). The vocalic inventory is given in (1). The listed vowels are also present underlyingly.[1]

(1) Polish vowels

Vowels	a	ɛ	ɔ	u	i	ɨ
High	–	–	–	+	+	+
Back	+	–	+	+	–	+
Low	+	–	–	–	–	–
Round	–	–	+	+	–	–

provement of booth the content and the presentation of my analysis. Nevertheless, let me add that the responsiblilty for this article is solely mine.

[1] Polish vocalic inventory includes also *yers,* the renowned Slavic vowels that exhibit a pattern of alternation with zero, for instance *sen* 'dream' (masc. nom. sg.) – *sn+u* (gen.). Nevertheless, I abstract away from the discussion of yers as it is beyond the scope of this paper and does not contribute to my analysis. For details see, for example, Rubach (1986, 2013) and Szpyra (1992).

The phonetic inventory of Polish voiced and voiceless velars is given in (2).

(2) Polish velars

Velar	k	k'	g	g'	x	x'
Continuant	–	–	–	–	+	+
Back	+	–	+	–	+	–

As can be observed, Polish consonants are either hard, [+back], or soft, [−back]. In this way, Polish does not have consonants that are neutral – unspecified for backness.

1.2. Processes

Polish velars [k g x] undergo phonemic palatalization deriving [č dž š], respectively. Consider the data below.

(3) Phonemic velar palatalization
    a. ha*k* [k] 'hook' (masc. nom.sg.) – za+ha*cz*+*y*+*ć* [čitɕ] 'to hook'
    b. móz*g* [k][2] 'brain' (masc. nom.sg) – od+móż*dż*+*y*+*ć* [džitɕ] 'to rack one's brains'
    c. stra*ch* [x] 'fear' (masc. nom.sg.) – stra*sz*+*y*+*ć* [šitɕ] 'to scare'

As shown in (3), velar stops [k g] alternate with affricates [č dž], while the velar spirant [x] alternates with the fricative [š]. On the surface, the context of these alternations may seem non-standard as the changes are triggered by the [+back] vowel [ɨ], which is the verbal morpheme, instead of the [−back] [i], which is usually regarded as a palatalizing segment. However, at the underlying level the form of the verbalizing morpheme must be //i//.[3] This becomes evident when we consider the examples in the class of labials.

(4) a. ro*b*+ot+a [b] 'work' (fem. nom.sg.) – ro*b*+*i*+ć [b'i] 'to work'
    b. mo*w*+a [v] 'speech' (fem. nom.sg.) – mó*w*+*i*+ć [v'i] 'to speak'
    c. pla*m*+a [m] 'stain' (fem. nom.sg.) – pla*m*+*i*+ć [m'i] 'to stain'

Labials are palatalized before the verbalizing [i] and since the examples in (3) include the same verbalizing morpheme, the surface form of //i// in (3) must be obscured due to the application of a rule applying at an earlier stage. The process is called Retraction and changes underlying //i// into [ɨ] after hard coronals. I state the rule schematically in (5).

(5) Retraction
    i → ɨ/ š ž č dž _

---

[2] Due to Final Devoicing, //g// is devoiced to [k].
[3] I use double slashes for underlying representations, single slashes for intermediate representations and square brackets for phonetic representations.

The surface form of the verbalizing morpheme in (3) is now clear. Velars are palatalized before the underlying //i//, which is then subject to Retraction. The process responsible for the alternations in (3) is known as First Velar Palatalization.

(6) First Velar Palatalization[4]
     k g x → č dž š/_ i

It must be noted that the changes in (6) are phonemic as the outputs are also present underlyingly. Apart from the phonemic palatalization, velars may undergo a different type of process that exerts allophonic softening of the consonants before the vowel [i]. The effects of allophonic palatalization are shown in (7).

(7) Allophonic palatalization
     a. *k*anał 'channel' [k] (masc. nom.sg.) – *k*ino 'cinema' [k'] (masc. nom.sg.)
     b. *g*azeta 'newspaper' [g] (fem. nom.sg.) – *g*itara 'guitar' [g'] (fem. nom.sg.)
     c. *h*amak 'hammock' [x] (masc. nom.sg.) – *h*istoria 'history' [x'] (fem. nom.sg.)
     d. hama*k I*reny [k' i] 'Irene's hammock'
     e. móz*g I*reny [k' i] 'Irene's brain'
     f. stra*ch I*reny [x' i] 'Irene's fear'

The scope of the rule in (7) is different than that of First Velar Palatalization. Allophonic palatalization can apply inside words and across word boundaries, as opposed to First Velar Palatalization, which applies only across morpheme boundaries. The [−back] outputs in (7) are the results of Surface Palatalization, a rule stated below.

(8) Surface Palatalization[5]
     C → C'/_ i

Surface Palatalization is not restricted to velars and applies to every consonant before [i], for instance *pisk* [p'isk] 'squeal', *sinus* [s'inus] 'sine' or *tik* [t'ik] 'twitch'. Moreover, Surface Palatalization may interact with another process that targets underlying //i//, namely Velar Fronting, which changes //i// to [i]. To prepare for the discussion of Velar Fronting, let us first look at the morphological composition of masculine plural nouns, which is crucial for further analysis.

---

   [4] The context for First Velar Palatalization is broader as it also involves the vowel [ɛ]. For instance, *bok* [k] (masc. nom.pl) 'side' – *bocz+ek* [č] (dim.). For discussion, see Rubach (1984).
   [5] Surface Palatalization may also be triggered by [j]. However, I disregard this fact here as it does not contribute to the discussion in the present paper. For further details, see Rubach (1984).

1.3. Masculine plurals

Polish masculine nouns may form their plurals by the addition of either [i] or [ɨ]. Moreover, both vowels can appear in the same context and the only difference is that [i] triggers palatalization of the preceding obstruent as in, for instance, *chłop* [p] 'peasant' (masc. nom.sg.) – *chłop+i* [pʼi]⁶ (nom.pl.), as opposed to [ɨ], which does not soften the consonant, as in *stop* [p] 'alloy' (masc. nom.sg.) – *stop+y* [pɨ] (nom.pl.). Since the context of appearance of both vowels is identical, it is impossible to provide a phonological explanation for the distribution of both segments. Nevertheless, the appearance of the relevant suffix is predictable once we consider the semantic properties of the aforementioned masculine nouns. Namely, words such as *chłop* refer to humans and belong to a class of personal nouns. Masculine personal nouns are commonly referred to as virile nouns. On the other hand, *stop* is not associated with humans so it is an example of an impersonal noun. Such nouns are called non-virile. Therefore, the distribution of the plural suffixes is governed by the semantic properties of the stem: //i// attaches to virile stems, while //ɨ// to non-virile stems. However, as Polish data show, the distribution of both suffixes after root-final velars may be somewhat confusing as it is obscured by the phonological processes found in the language. Consider the examples in (9).

(9) Root – final velars
    ha*k* 'hook [k] (masc. nom.sg.) – ha*k+i* [kʼi] (nom.pl.)
    brze*g* 'river bank' [k] (masc. nom.sg.) – brze*g+i* [gʼi] (nom.pl.)
    stra*ch* 'fear' [x] (masc. nom.sg.) – stra*ch+y* [xɨ] (nom.pl.)

As the examples show, the velar stops [k g] take [i] as their suffix, while the velar spirant [x] is followed by [ɨ]. This is surprising given the fact that all the stems in (9) are those of impersonal nouns, hence are non-virile, and each stem should be followed by the [+back] [ɨ]. This observation is correct for *strach+y* but not for *hak+i* or *brzeg+i*, as the latter have [i] instead of [ɨ]. One possible explanation is that the peculiar behavior of the word-final obstruents may suggest the existence of two allomorphs, [i] and [ɨ], whose appearance depends on the preceding consonant: [k g] take the soft [i], while the velar [x] chooses [ɨ]. Nevertheless, if the nom.pl. suffix were //i//, we should expect the words in (9a–b) to incorrectly undergo First Velar Palatalization and subsequent Retraction, thus producing **haczy* [hačɨ] and **brzedży* [bžɛdžɨ], which is counterfactual. Therefore, the underlying form of the suffix must be //ɨ//. The dichotomy between the surface forms in (9) is easily captured by resorting to the rule of Velar Fronting, which changes the [+back] [ɨ] into a [−back] [i] after [k g]. I state the rule informally in (10).

---

⁶ The surface form of *chłop+i* [pʼi] is the effect of Surface Palatalization.

(10) Velar Fronting[7]
       $ɨ → i/ k g\_$

The existence of the process is supported by the fact that clusters *kɨ and *gɨ
are impossible[8] in Polish. On the other hand, [x] can freely combine with both
[ɨ] and [i], for instance *hit* [x'it] 'hit' (masc. nom.sg.) and *hydrant* [xɨdrant]
'hydrant' (masc. nom.sg.). In addition, the rules of Velar Fronting and Surface
Palatalization are in a feeding relation. Namely, the fronting of //ɨ// to [i] cre-
ates the context for the application of Surface Palatalization as in, for example,
hak+i: //k+ɨ// → /k+i/ → [k'i].

   Apart from the standard distribution of the masculine plural suffixes, Pol-
ish virile stems may be followed by //ɨ//, which is usually associated with non-
virile stems. This is shown in (11).

(11) Virile stems followed by [ɨ]
       chło*p* [p] 'peasant' (masc. nom.sg.) – chło*p+y* [pɨ] (non-virile)
       studen*t* [k] 'student' (masc. nom.sg.) – studen*t+y* [tɨ] (non-virile)
       Pola*k* [k] 'Pole' (masc. nom.sg.) – Pola*k+i* [k'i] (non-virile)

It is clear from (11) that the addition of //ɨ// does not trigger palatalization in
chłop+y or *student+y*. On the other hand, *Polak+i* undergoes palatalization
because the underlying //ɨ// has been fronted to [i] via Velar Fronting, which
triggers Surface Palatalization and renders the palatalized [k'], similarly to the
examples in (9). Although the forms in (11) are attested in Polish, they are not
preferred by the native speakers. This is because the concatenation of a non-
virile suffix with a virile stem may result in pejorative or even derogatory con-
notations.[9]

   The existence of the two masculine plural suffixes together with the rules
of Surface Palatalization and Velar Fronting adds to the complexity of pala-
talization processes that affect Polish velars. For convenience, I gather all the

---

   [7] A reviewer asks whether vowel fronting and retraction are present in other Slavic lan-
guages. The answer is positive. Vowel fronting is attested in, for example, Russian to the extent
that it is similar to Polish. In Russian, the vowel [ɨ], which acts as the plural suffix, e.g. *nos+y* [sɨ]
'noses', is fronted after velars: *kazak+i* 'Cossacks' [k'i]. In Ukrainian, on the other hand, vowel
fronting is not present, for example *bok+y* 'sides' [kɨ].
   Russian also has an active rule of vowel retraction. During the process [i] retracts to [ɨ] after
hard coronals, for example *iskat'* 'look for' – *raz+yskat'* [zɨ] (perfective). For further details re-
garding Russian and Ukrainian see, Rubach (2000a) and Rubach (2005), respectively.
   [8] There are, nevertheless, three exceptions to this generalization that I am aware of. Namely,
in *kynolog* 'cynologist', the last name *Kydryński* and in the phrase *a kysz!* 'begone', the stem-initial
velars are followed by [ɨ].
   [9] As noted by a reviewer, the non-virile form *chłopaki* 'guys', which underlyingly has //k+ɨ//,
is not considered pejorative. Moreover, *chłopaki* is used more commonly than the virile form
chłopacy.

previously discussed examples in (12). The list is expanded by the addition of one pair of words, *Polak – Polac+y*.[10]

(12) Virile and non-virile forms
    a. //ɨ// is added after non-virile nouns to form plurals
       sto*p* [t] 'alloy' (masc. nom.sg.) – sto*p+y* [pɨ] (non-virile)
       stra*ch* [x] 'fear' (masc. nom.sg.) – stra*ch+y* [xɨ] (non-virile)
       ha*k* [k] 'hook' (masc. nom.sg.) – ha*k+i* [k'i] (non-virile)
    b. //ɨ// is added after virile nouns to form plurals
       chło*p* [p] 'peasant' (masc. nom.sg.) – chło*p+i* [p'i] (virile)
       studen*t* [t] 'student' (masc. nom.sg.) – studen*c+i* [tɕi][11] (virile)
       Pola*k* [k] 'Pole' (masc. nom.sg.) – Pola*c+y* [tsɨ] (virile)
    c. //ɨ// is added after virile nouns to form plurals with pejorative meanings
       chłop [p] 'student' (masc. nom.sg.) – chło*p+y* [pɨ] (non-virile)
       studen*t* [t] 'student' (masc. nom.sg.) – studen*t+y* [tɨ] (non-virile)
       Pola*k* [k] 'Pole' (masc. nom.sg.) – Pola*k+i* [k'i] (non-virile)

The intricate relations between the masculine plural nouns are easily accommodated if the vowel //ɨ// is granted its phonemic status. This is because the addition of the [+back] suffix //ɨ// explains the similarity between the non-virile forms and the pejorative forms of masculine nouns.

    The next section reviews the arguments in favor of the single-phoneme approach presented in Padgett (2001, 2003, 2010).

2. A single-phoneme approach

The phonemic status of [ɨ] has been one of the key issues in the phonology of Slavic languages.[12] The current view regarding the underlying status of [ɨ] is attributed to Padgett (2001, 2003, 2010), who bases his analyses on Russian. In Russian, consonants are palatalized before the vowel [i], as in [b'it'] 'to beat',

---

[10] The surface form of [pɔlatsɨ] is the result of Second Velar Palatalization. Second Velar Palatalization targets the outputs of First Velar Palatalization, /č dž š/, and changes them to [ts dz s], respectively. Given the example at hand, *Polac+y*, the underlying stem-final velar first undergoes First Velar, then Second Velar Palatalization and Retraction: //pɔlak+i//→ /pɔlač+i/→ /pɔlats+i/→ [pɔlatsɨ]. Notice that the suffix vowel must be crucially //i//, not //ɨ//, as otherwise we would witness the application of Velar Fronting. For further details regarding Second Velar Palatalization see Rubach (1984).

[11] The word *studenc+i* is an example of Coronal Palatalization, a rule that changes underlying coronals to prepalatals before [i], //studɛnt+i// → [studɛntɕi]. For discussion, see Rubach (1984).

[12] The first mention of the i/ɨ issue in Polish can be traced back to Baudouin de Courtenay (1894), who regards the vowel [ɨ] as an allophone of /i/. Later studies, for instance Biedrzycki (1963), Stieber (1973), Gussmann (1980) and Rubach (1984) regard [ɨ] as a separate phoneme. However, a review of the development of these ideas would merit a different paper.

and remain non-palatalized before [ɨ], as in [bɨt'] 'to be'. Moreover, [ɨ] can never appear after velars, thus clusters such as *[kɨ], *[gɨ] or *[xɨ] are unattested in Russian. These generalizations, as well as the analysis of acoustic data obtained from a group of Russian native speakers, guided Padgett (2001) to reinterpret the sound associated with the vowel [ɨ] as a velarization of the preceding consonant. According to Padgett (2001), in a string of a consonant and [ɨ], [Cɨ], the velarization from the consonant spreads onto the following vowel causing an illusion of [ɨ]. Given that, clusters such as [Cɨ] should be now re-analyzed as an instantiation of a velarized segment, [Cˠ], followed by [i]. Consequently, [bɨt'] 'to be' is now [bˠit'].[13]

In the same vein, Padgett (2001) argues that velarization of a consonant causes an illusion of [ɨ] across words. To support his argument, he relies on the well-known process of Russian vowel retraction.[14] It has been commonly assumed that Russian //i// retracts to [ɨ] when it is preceded by a [+back] consonant. Thus, in a phrase *brat Ivana* 'Ivan's brother', [ɨ] retracts because it is preceded by the [+back] coronal: //tˠ i// → [tˠ ɨ]. However, Padgett observes that [ɨ] does not appear in Russian at the beginning of words unless it is preceded by a consonant in a phrase. Therefore, he claims, the phonetic realization of the sound associated with [ɨ] must come from the [+back] quality of the preceding consonant, which spreads onto the following word and renders the [ɨ]-like sound.

The straightforward conclusion arising from the abovementioned arguments is the idea that [ɨ] does not exist at all. According to Padgett (2001),[15] the vowel is neither a phoneme nor an allophone but an illusion created by the preceding consonant. Furthermore, if [ɨ] is altogether absent, then the fact that Russian speakers can pronounce the sound [ɨ] in isolation, for instance when they refer to the name of the letter ы, is also an example of velarization of a consonant. Padgett (2010) maintains that during the pronunciation of ы Russians produce a sequence of a glottal stop and [i]. Since what they hear is a sound identical to [ɨ], the glottal stop is velarized and the velarization spreads onto the following vowel, causing an illusion of [ɨ]. Hence, the pronunciation of ы is [ʔˠi].[16]

Seeing that the debate on the nature of [ɨ] is still present in phonological research, this article attempts to investigate the question of whether Padgett's single-phoneme assumption regarding the phonemic status of [ɨ] can

---

[13] In the remainder of this article, I leave velarized consonants without any superscript, [C].

[14] See, for instance, Halle (1959), Lightner (1965) and Rubach (2000a).

[15] Padgett (2001: 9) explicitly states that there is no "[…] phonetic (let alone phonemic) category ɨ […]."

[16] An opposing view that recognizes the underlying status of [ɨ] in Russian is represented by Plapp (1996, 1999).

be extended to Polish.[17] Polish perspective on the issue seems reasonable due to the fact that Polish [ɨ] behaves similarly to its Russian congener. Namely, [i] always appears after soft segments, while [ɨ] appears after non-palatalized consonants. Moreover, clusters such as *[kɨ] or *[gɨ] are also impossible in Polish.[18] Instead, we find a combination of a velar stop and [i], as in *kino* [k'inɔ] 'cinema' (masc. nom.sg.) or *gitara* [g'itara] 'guitar' (fem. nom.sg.). Finally, Poles also have a designated letter of the alphabet to represent the vowel [ɨ], spelled *y*. In light of these facts, in the following section I recast the palatalization processes from Section 1 assuming that [ɨ] does not exist.

3. Analysis: no underlying //ɨ//

This section reanalyzes the discussed processes under the assumption that //ɨ// does not exist as a segment. It is argued in Section 3.1 that the single-phoneme approach necessitates phonological use of diacritics (Kiparsky 1973) to differentiate among the palatalizing and non-palatalizing contexts of rule application. However, the reliance on diacritics significantly increases the number of rules that are needed to account for the newly created morphological contexts.

3.1. Descriptive facts and new generalizations

Under the single-phoneme approach the phonemic status of the vowel [ɨ] is called into question. Namely, as argued in Padgett (2001, 2003, 2010), [ɨ] does not exist at all. Instead, Padgett claims, what we actually hear is an illusion created by the velarization of the preceding consonant. Bearing this reasoning in mind, let us first consider some descriptive facts that the single-phoneme approach entails, and analyze the morphological structure of words that are relevant for further discussion. To do so, in (13) I provide a refurbished list of words from (12). This time, however, I will assume the single-phoneme approach and use the following transcription system. The non-palatalizing back vowel [ɨ] will be transcribed as [i], but the preceding consonant will not show the effects of Surface Palatalization, for example *strach+y* [straxi]. The

---

[17] The lack of phonemic /ɨ/ in Polish is also mentioned in Czaykowska-Higgins (1988) and Gussmann (2007). However, contrary to Padgett (2001, 2003, 2010), they recognize the existence of the vowel but, similarly to Baudouin de Courtenay (1894), regard it as an allophone of /i/. Moreover, it must be noted that the analyses presented in Gussmann (2007) are couched in Government Phonology, a framework which treats the i/ɨ issue differently than the one adopted in this paper.

[18] Recall that cluster [xɨ] is widely attested in Polish, for instance, *chyba* [xɨba] 'perhaps', *chytry* [xɨtrɨ] 'cunning', *hydrant* [xɨdrant] 'hydrant' or *hybryda* [xɨbrɨda] 'hybrid'.

palatalizing front vowel will also be transcribed as [i], but the preceding consonant will be allophonically softened, for instance *hak+i* [xak'i]. Consider the data below (for the sake of clarity the standard transcription is provided in brackets).

(13) Virile and non-virile forms in Polish (no underlying //i//)
    a. //i// is added after non-virile nouns to form plurals
       sto*p* [p] 'alloy' (masc. nom.sg.) – sto*p+y* [pɨ] (non-virile; = [pɨ] in standard transcription)
       stra*ch* [x] 'fear' (masc. nom.sg.) – stra*ch+y* [xɨ] (non-virile; = [xɨ])
       ha*k* [k] 'hook' (masc. nom.sg.) – ha*k+i* [k'i] (non-virile)
    b. //i// is added after virile nouns to form plurals
       chło*p* [p] 'peasant' (masc. nom.sg.) – chło*p+i* [p'i] (virile)
       studen*t* [t] 'student' (masc. nom.sg.) – studen*c+i* [tɕi] (virile)
       Pola*k* [k] 'Pole' (masc. nom.sg.) – Pola*c+y* [tsɨ] (virile; = [tsɨ])
    c. //i// is added after virile nouns to form plurals with pejorative meanings
       chłop [p] 'student' (masc. nom.sg.) – chło*p+y* [pɨ] (non-virile; = [pɨ])
       studen*t* [t] 'student' (masc. nom.sg.) – studen*t+y* [tɨ] (non-virile; = [tɨ])
       Pola*k* [k] 'Pole' (masc. nom.sg.) – Pola*k+i* [k'i] (non-virile)

The refurbished list in (13) poses a number of problems. First, in (13a) it is impossible to account for the softening of the stem-final consonant in *hak+i* and explain the lack of palatalization effects in *stop+y* or *strach+y*. Since the stems in (13a) are followed by exactly the same vowel, then all the cited examples should either exhibit the reflexes of allophonic palatalization, or the stem-final consonants in these words should not be softened at all. Each option seems possible as it is supported by independent evidence: allophonic palatalization by *hak+i* [k'i] and its lack by *stop+y* [pɨ] or *strach+y* [xɨ]. Nevertheless, neither solution would produce fully attested forms as we need to account for the two cases simultaneously. Thus, to solve the conundrum and distinguish the suffixes in (13a) we would have to mark the suffix in *hak+i* as sensitive to palatalization. Given that, the rule of Surface Palatalization would have to be restated as follows.

(14) Surface Palatalization (version I)
    $C \rightarrow C'/\_i_{[pal]}$

As a consequence, the underlying form of *hak+i* is //xak+i$_{[pal]}$//, while *strach+y* and *stop+y* are represented as //strax+i// and //stɔp+i//, respectively. Now the application of the rule in (14) is obvious. The process will apply to //xak+i$_{[pal]}$// as only the suffix in *hak+i* is diacritically marked. The solution is, nevertheless, problematic as now we have two non-virile suffixes: //i$_{[pal]}$// and //i//. This, on the other hand, leads to the observation that palatalization in *hak+i* is a mere accident, not a phonological regularity but an effect of a diacritic. Moreover, since there are two separate suffixes in (13a), their relatedness is lost. Such an

outcome is unwelcome because, as shown in (12), the suffixes are related morphologically.

The list in (13) is rife with other issues. Another problem is the set of words in (13c). Notice that the pejorative form *Polak+i* 'Poles' (non-virile) exhibits Surface Palatalization on the stem-final velar. Nonetheless, there is no such effect in the pejorative forms of *student+y* 'students' (non-virile) or *chłop+y* 'peasants' (non-virile). Since the stems in (13c) are concatenated with the same suffix, it is, to say the least, odd that the suffix vowel in *Polak+i* palatalizes the preceding consonant but the same vowel does not enforce palatalization in *student+y* and *chłop+y*. To account for this discrepancy, we may again mark the relevant suffix in (13c) as sensitive to palatalization. Nevertheless, we encounter the same problem as with the set in (13a). Namely, by designating the suffix in *Polak+i* as the trigger of palatalization, we actually claim that there are, in fact, two suffixes of the pejorative virile form: one that palatalizes, as in *Polak+i*, and one that does not, as in *chłop+y* or *student+y*. Again, the diacritic marking is crucial as only then can we restrict the allophonic softening of the stem-final velar to the word *Polak+i,* and prevent the consonant in *chłop+y* and *student+y* from palatalizing. Thus, the suffix in *Polak+i* can be marked as //i$_{[pal]}$// to distinguish it from the non-palatalizing //i//. Nonetheless, this solution, which seemed workable for the words in (13a), cannot be extended to the set in (13c). Interestingly, the problem here pertains to the nature of the diacritic itself, as each diacritically specified context of palatalization advocates for an exclusive application of the process. In other words, although the softening of the stem-final velars in *hak+i* (13a) and *Polak+i* (13c) results from the application of the same rule of Surface Palatalization, the palatalization effects in these words must be regarded now as separate processes. This is due to the fact that the palatalization reflexes in *hak+i* and *Polak+i* are triggered by separate, morphologically-specified contexts. Namely, the triggers in (13a) and (13c) are different morphemes and have different functions. The palatalizing [i] in (13a) is a non-virile suffix, whereas the morpheme in (13c) conveys pejorative associations. Hence, marking both suffixes as //i$_{[pal.]}$// would be incorrect. The solution is to index the palatalizing non-virile suffix in *hak+i* as //i$_{[non-virile\ pal.]}$//, as opposed to the palatalizing pejorative suffix in *Polak+i*, which is diacritically specified as //i[pej. pal.]//. Moreover, we must employ the same strategy of diacritic marking to non-palatalizing suffixes in (13a) and (13c), as they are also different. Bearing that in mind, I mark the non-palatalizing non-virile [i] in *strach+y* and *stop+y* as //i$_{[non-virile]}$//, while the non-palatalizing pejorative [i] in *chłop+y* and *student+y* is specified as //i$_{[pej.]}$//. To summarize, we need two instances of Surface Palatalization to account for the data in (13a) and (13c): one that covers *hak+i* and one that applies to the pejorative *Polak+i*. These separate processes, which are now called Non-Virile and Pejorative, are given in (15).

(15) Processes of allophonic palatalization
    a. Non-virile Allophonic Palatalization: C → C'/_ i$_{[non\text{-}virile\ pal.]}$
    b. Pejorative Allophonic Palatalization: C → C'/_ i$_{[pej.\ pal.]}$

Yet another problem comes to light when we juxtapose the examples in (13b), such as *chłop+i* [p'i], *studenc+i* [tɕi] and *Polac+y* [tsi], with the words in (13c), such as *chłop+y* [pi], *student+y* [ti] and *Polak+i* [k'i]. A brief examination of the two sets suffices to notice a paradox as exactly the same set of data exhibits different outcomes. The examples that are easily accounted for under the two-phoneme approach are now incomprehensible. In (13b), the bilabial stop in *chłop+i* is palatalized allophonically, as opposed to the coronal [t] in *studenc+i* and the velar [k] in the pair *Polac+y*, which undergo phonemic palatalization. On the other hand, in (13c), the velar is palatalized allophonically, as in *Polak+i* [k'i], while the remaining consonants are not palatalized at all, as in *chłop+y* [pi] or *student+y* [ti]. Given the single-phoneme approach, it is impossible to predict when the root-final consonants should palatalize, and, if they do, whether it should be a phonemic or an allophonic palatalization. To dispel confusion, we need to resort to diacritics again to differentiate between the processes that apply to both sets.

In (13b), the word *chłop+i* 'peasants' (virile) entertains allophonic palatalization on the stem-final obstruent.[19] However, the process responsible for the softening of the bilabial stop must be crucially different from the rules stated in (15). This is based on the observation that the vowel in *chłop+i*, being a palatalizing virile suffix, is different than the suffixes listed for the rules in (15), as those rules apply only to suffixes that are either non-virile (15a) or pejorative (15b). Thus, I mark the palatalizing //i// in *chłop+i* as //i$_{[virile\ pal.]}$// and, by the same token, increase the number of processes responsible for the allophonic palatalization to three. The new rule is stated in (16).

(16) Virile Allophonic Palatalization
    C → C'/_ i $_{[virile\ pal.]}$

---

[19] A reviewer expresses concern whether the process responsible for the softening of the stem-final labial in *chłop+i* should be regarded as an instance of allophonic palatalization because /p/ and /p'/ are regarded as underlying segments in Polish. The answer is two-fold. First, the underlying form of a labial depends on the dialect of Polish. In Standard Polish, soft labials are not present underlyingly. Instead, underlying labials are palatalized when they are followed by [j], for example *piasek* //pjasɛk// → [p'jasɛk] 'sand', as opposed to *pasek* //pasɛk// → [pasɛk] 'small belt'. In Eastern Polish, on the other hand, labials are underlyingly soft: *piasek* //p'asɛk// and *pasek* //pasɛk//. Second, the underlying form of the stem-final //p// in *chłop+i* cannot be soft because the inflected forms of the word exclude such possibility. If we assume a soft stem-final [p'] in *chłop+i,* then the pejorative form *chłop+y* [pi] or the genitive *chłop+a* [pa], which are not palatalized, would be impossible to derive. Therefore, I conclude that the [–back] quality of the stem-final labial in *chłop+i* is a result of allophonic palatalization.

To recapitulate the discussion so far, the lack of //ɨ// severely complicates the analysis of Polish palatalization. Given that there is only one phoneme [i], it is necessary to specify those [i]'s that act as the triggers of the process, as there are other [i]-suffixes that do not enforce palatalization, for example *strach+y* [straxi] 'fears' (non-virile). Nevertheless, such strategy entails an extensive use of diacritics and results in the proliferation of rules that are necessary to account for virtually identical changes. Furthermore, by ascribing a rule to a given diacritic we lose the generalization that the process is triggered by a [−back] segment. The new context of rule application must be stated in purely morphological terms and calls for phonological use of diacritic features (Kiparsky 1973). Hence, the rule of Surface Palatalization has to be cloned three times to accommodate disparate morphological contexts.

Let us now turn our attention to First Velar Palatalization. Under the two-phoneme approach the context of palatalization is easily resolved: the [−back] [i] acts as the trigger, while the [+back] [ɨ] does not enforce any changes. However, if [ɨ] does not exist, then every [i]-initial suffix must be specified as either palatalizing or non-palatalizing. Since the procedure of diacritic marking is now applied across the board, it should also include those [i]-initial suffixes that trigger First Velar Palatalization. Given that, the examples cited in (3) should also carry a diacritic marking that triggers phonemic palatalization. Since, as argued in Section 1.2, the suffixes in *za+hacz+y+ć* 'to hook', *od+móżdż+y+ć* 'to rack one's brain' and *strasz+y+ć* 'to scare' are all verbalizing suffixes, I mark them as //i$_{\text{[verb. pal.]}}$//. Consequently, the rule that is responsible for the phonemic palatalization of velars before the verbalizing suffix is called Verbalizing Phonemic Palatalization, a cloned version of First Velar Palatalization. The process is stated in (17).

(17) Verbalizing Phonemic Palatalization

$$k\ g\ x \rightarrow č\ dž\ š /\_\ i_{\text{[verb. pal.]}}$$

The following section focuses on rule-based accounts of the processes discussed above. The analyses utilize the new rules and discuss the consequences of diacritic marking.

3.2. Derivations

Let us consider the analyses of *hak+i* 'hooks' (non-virile), *chłop+i* 'peasants' (virile) and *strach+y* 'fears' (non-virile) under the single-phoneme approach. The derivations are given in (18), where I look at the relevant fragment of each word only.

(18) Derivations of *hak+i, chłop+i* and *strach+y* (a single-phoneme analysis)

	hak+i	*chłop+i*	*strach+y*	
UR	$//k+i_{[\text{non-virile pal.}]}//$	$//p+i_{[\text{virile pal.}]}//$	$//x+i_{[\text{non-virile}]}//$	
	$k'+i_{[\text{non-virile pal.}]}$	–	–	Rule (15a)
	–	$p'+i_{[\text{virile pal.}]}$	–	Rule (16)
Surface Form	[k'i]	[p'i]	[xi]	

In (18), each palatalizing suffix triggers the relevant rule. The word *strach+y* does not undergo palatalization because its suffix is not ascribed to any rule, which is correct. Observe that the ordering between (15a) and (16) is completely arbitrary. A reverse ordering, first (16) then (15a), would generate exactly the same results. Also, the feeding order of Velar Fronting and Surface Palatalization, which was necessary to account for *hak+i,* is now lost because the rule of Velar Fronting does not exist anymore. The processes that are responsible for the surface forms in (18) are now completely unrelated as they are triggered by different diacritics. This observation, however, proves that the featural content of a segment is irrelevant under the single-phoneme approach. The approach fails to capture the phonological generalization that those processes occur before the [−back] vowel [i], not before, for example, the vowel [a] or [ɔ]. The fact that the rules are triggered by specific diacritics leads to the morphologization of processes that can be stated in purely phonological terms.

The analysis of *za+hacz+y+ć* 'to hook' is rather undemanding. Consider the derivations in (19), where I analyze *za+hacz+y+ć* together with the pejorative form *Polak+i* 'Poles'.

(19) Derivation of *za+hacz+y+ć* 'to hook' and *Polak+i* 'Poles' (pejorative non-virile)

	za+hacz+y+ć	*Polak+i*	
UR	$//k+i_{[\text{verb. pal.}]}+t\mathit{c}//$	$//k+i_{[\text{pej. pal.}]}//$	
	$č+i_{[\text{verb. pal.}]}+t\mathit{c}$	–	Rule (17)
	–	$k'+i_{[\text{pej. pal.}]}$	Rule (15b)
Surface Form	[čitɕ]	[k'i]	

The result is correct as the given rules are triggered by the relevant, diacritically marked suffixes. Furthermore, the analysis of *za+hacz+y+ć* does not require Retraction. Similarly to Velar Fronting, the rule is not necessary.

The rules in (15) and (16) do not exhaust all the [i]-initial suffixes that trigger allophonic palatalization of velars. The examples cited below expand the list further.

(20) [i]-suffixes (allophonic palatalization)
    a. Personalizing //ist//
      szach+y 'chess' – szach+ist+a 'the one who plays chess'
      //šax+ist+a// → [šax'ista]
    b. Verbalizing //izɔva//
      Czech+y 'Czech Republic' – czech+izować 'to make Czech-like':
      //čɛx+izɔva+tɕ// → [čɛx'izɔvatɕ]
    c. Feminizing //iɲ//
      monarch+a 'monarch' – monarch+in+i
      //mɔnarx+iɲ+i// → [mɔnarx'iɲi]
    d. Feminine genitive //i//
      lask+a 'cane' – lask+i
      //lask+i// → [lask'i]

The suffixes in (20) would require four separate rules to accommodate their palatalizing contexts. Thus, together with (15a–b) and (16), we need seven unrelated rules that are responsible for the same process of allophonic palatalization, instead of a single rule of Surface Palatalization.

Following the same reasoning, it is possible to find a whole gamut of examples of [i]-initial suffixes that trigger phonemic palatalization of velars. The relevant examples are given below.

(21) [i]-suffixes (phonemic palatalization)
    a. Diminutive //ik//
      hak 'hook' – hacz+yk
      //xak+ik// → [xačik]
    b. Diminutive //in//
      krzak 'bush' – krzacz+yn+a
      //kšak+in+a// → [kšačina]
    c. Augmentative //isk//
      brzuch 'stomach' – brzusz+ysk+o
      //bžux+isk+ɔ//→ [bžušiskɔ]
    d. Adjectival //ist//
      sok 'juice' – socz+yst+y
      //sɔk+ist+i// → [sɔčisti]
    e. Adjectival //iv//
      robak 'worm' – robacz+yw+y
      //rɔbak+iv+i// → [rɔbačivi]
    f. Feminizing //its//
      wilk 'wolf' – wilcz+yc+a
      //vilk+its+a// → [vilčitsa]

   g. Pejorative //idł//[20]
     strach 'fear' – strasz+ydł+o
     //strax+idł+ɔ// → [strašidłɔ] Denominal //ik//
   h. błysk 'flash' – błyszcz+yk 'lip-gloss'
     //błisk+ik// → [błiščik][21]

These eight suffixes, together with the verbalizing suffix of *za+hacz+y+ć*, re-
quire an equal number of rules to account for the reflexes of what used to be
a single process of First Velar Palatalization. The proliferation of rules, nine in
total for the phonemic palatalization and seven for the allophonic, is inevitable
as it is the only way to account for the current facts of the language. This rule
replication can be easily avoided if //ɨ// is granted its phonemic status, which is
shown in the following section.

4. Re-analysis: underlying //i// and //ɨ//

This section offers a rule-based account of the processes affecting Polish velars
under the assumption that //ɨ// is present underlyingly. Section 4.1 constitutes
a short review of the main principles underlying the theory of Lexical Phonol-
ogy (Kiparsky 1982; Mohanan 1986; Booij and Rubach 1987) (henceforth, LP).
Section 4.2 presents LP analyses of words that were problematic for the single-
phoneme approach, such as *hak+i* 'hook' (masc. nom.pl.), *za+hacz+y+ć* 'to
hook' and *strach+y* 'fear' (masc. nom.pl.).

4.1. The LP framework

One of the main tenets of LP is the division of labor into orderly blocks of rules:
cyclic, *postcyclic* and *postlexical* rules.[22] Each block operates only within the
purview of its domain. Thus, cyclic rules operate across morpheme bounda-
ries, postcyclic rules extend their scope of application to the domain of a word,
whereas postlexical rules apply within the domain of a sentence, taking into
consideration the whole phrases. Moreover, as the name suggests, the cyclic
component encompasses cyclic application, meaning that cyclic rules reiterate
as long as the new material for derivation is provided. To ensure the proper ap-
plication of cyclic rules, LP employs the principle of the *Strict Cycle Condition*
(henceforth, SCC), which states that the rules must apply in derived environ-
ments. An environment may be derived morphologically, by word-formation

---

[20] I abstract away from the process of Lateral Vocalization, where the velarized //ł// vocal-
izes to [w]: //ł// → [w]. Also, I abstract away from postulating yers in the transcription. For fur-
ther details, see Rubach (1984).

[21] The [šč] cluster is the result of Strident Assimilation.

[22] See Rubach (2008) for a concise yet thorough explanation of the LP framework.

rules (WFRs), or phonologically, by an earlier rule applying on the current cycle. Postcyclic rules, on the other hand, do not interact with WFRs and apply to already derived words, hence do not fall within the purview of the SCC. Finally, postlexical rules encapsulate the whole phrases, thus they include the processes which operate both inside words and across word boundaries.[23]

4.2. Analysis in LP

Before proceeding with the derivations of the relevant words in Lexical Phonology, it is necessary to establish the status of First Velar, Velar Fronting, Retraction and Surface Palatalization with regards to the three blocks of rules: *cyclic, postcyclic* and *postlexical.*

The cyclic status of First Velar Palatalization and Velar Fronting is supported by the observation that both processes apply across morpheme boundaries. For instance, in the word *strasz+y+ć* //strax+i+tɕ// 'to scare' the context for the application of First Velar Palatalization, the verbalizing morpheme //i//, is created by word-formation rules. In this way the environment is derived morphologically and the rule may apply. Moreover, the rule does not apply to word-internal strings. Specifically, First Velar Palatalization does not apply in *kino* [k'inɔ] 'cinema' even though the context for the rule is met: the velar [k] is followed by [i]. The reason is that the string [ki] is not created by a word-formation rule but is taken from the underlying representation: //kinɔ//. Given that, the environment in *kino* is not derived and First Velar Palatalization cannot apply. Instead, the velar is allophonically softened by Surface Palatalization, which affects word-internal strings. Owing to the fact that Surface Palatalization applies also across word boundaries, as in *hak Iren+y* [k' i] 'Irene's hook', the process must be assigned to the postlexical block.

The postcyclic status of Retraction can be motivated on the basis of the nativization of borrowings. Namely, in words such as, for example, *szyfr* [ʃɨ] 'code' or *żyrandol* [ʒɨ] 'chandelier', the native vowel /i/ is retracted to [ɨ]. Seeing that the context for Retraction does not include a morpheme boundary, the rule cannot be cyclic. The process cannot be postlexical either because in a phrase, for instance, *klacz Iren+y* [tʃ' i] 'Irene's mare', [i] does not retract to [ɨ] but, instead, triggers the softening of the affricate [tʃ] *via* Surface Palatalization. Since [i] does not retract across words, Retraction cannot be postlexical.

---

[23] The line of reasoning represented by LP has been taken up and developed by a version of Optimality Theory (Prince and Smolensky 2004; McCarthy and Prince 1995) known as Derivational Optimality Theory (Kiparsky 1997, 2000; Rubach 1997, 2000a, b, 2003, 2011, and others). The convergence is not exact, however. LP, like any other derivational theory, has no limit on the number of derivational stages, while Derivational Optimality Theory limits the number of derivational steps to four, recognizing the following levels: stem level, word level, clitic level and phrase level.

Let us now look at the analyses of *hak+i* 'hook' (masc. nom.pl.), *za+hacz+y+ć* 'to hook' and *strach+y* 'fear' (masc. nom.pl.), which are conducted under the assumption that the vowel [ɨ] is a member of the phonemic inventory of Polish. Consider the derivations in (22), where I look only at the relevant fragment of each word.

(22) Derivations of *hak+i, za+hacz+y+ć* and *strach+y* (a two-phoneme analysis)

	hak+i	*za+hacz+y+ć*	*strach+y*	
UR	//k+i//	//k+i+tɕ//	//x+i//	
Cycle 2[24]	/k+i/	/k+i+tɕ/	/x+i/	WFRs
	–	č+i	–	First Velar
	k+i	–	–	Velar Fronting
Cycle 3	–	č+i+tɕ	–	WFRs
	–	–	–	First Velar
	–	–	–	Velar Fronting
Postcyclic	–	/č+i+tɕ/	–	Retraction
Postlexical	ki	čitɕ	xɨ	Syntax
	k'i	–	–	Surface Pal.
Surface Form	[k'i]	[čitɕ][25]	[xɨ]	

The results of the derivations in (22) are correct. Under the two-phoneme assumption the framework correctly predicts that only the [−back] suffix in *za+hacz+y+ć* should trigger First Velar Palatalization. The word *strach+y* leaves the derivation unscathed due to the fact that the [+back] [ɨ] does not constitute a context for any palatalization. Furthermore, the universally accepted view that only [−back] segments can enforce palatalization effects is strengthened on the basis of Velar Fronting in *hak+i*. Specifically, once the underlying //i// has been fronted to /i/, the trigger of Surface Palatalization has been created and thus the stem-final velar may be softened. Finally, observe that Velar Fronting must be ordered after First Velar Palatalization as otherwise we would witness the effects of the latter in *hak+i*. Namely, had Velar Fronting been ordered before First Velar Palatalization, the early fronting of //i// to /i/ would have triggered the phonemic palatalization of [k] in *hak+i*.

---

[24] Since the application of all rules is blocked on the first cycle by the SCC, I omit Cycle 1 in the derivation.

[25] The word za+*hacz+y+ć* 'to hook' requires an additional, fourth cycle to add the prefix /za+/, which stems from the theoretical assumption of the framework, as the prefixes are added on a separate cycle. However, I ignore this fact here.

To conclude, the existence of the two vowels, [i] and [ɨ], allows for a uniform and predictable account of palatalization effects as only the former, but not the latter, constitutes the context for the relevant rules.

5. Conclusions

The absence of underlying //ɨ// demands a morphological treatment of Polish palatalization. Specifically, the assumption that there exists only [i] requires a diacritic marking of those [i]-suffixes that enforce palatalization of the preceding consonant. This procedure is crucial under the single-phoneme approach because not every [i]-initial suffix can act as the trigger of palatalization. The diacritic marking makes it possible to distinguish between the palatalizing [i] in, for instance, *hak+i* [kʲi], and the non-palatalizing [i] in, for example, s*trach+y* [xɨ]. However, as shown in Section 3, the outcome of the single-phoneme approach is the proliferation of suffixes, which require a significant number of rules to accommodate disparate morphological contexts. Moreover, following the analyses presented in this article, it is easy to predict that every phonological process that is triggered by the vowel [i] will share the fate of Surface Palatalization and First Velar Palatalization. On the other hand, as shown in Section 4, the underlying status of //ɨ// obviates the need for diacritic marking and precludes morphologization of the aforementioned rules. Therefore, the approach that does not recognize the underlying status of //ɨ// should be rejected.

References

Baudouin de Courtenay Jan I.N. 1894. Próba teorii alternacji fonetycznych, Część I – Ogólna. *Rozprawy Akademii Umiejętności. Wydział Filologiczny* 20, 219–364.

Biedrzycki Leszek (1963). Fonologiczna interpretacja polskich głosek nosowych. *Biuletyn Polskiego Towarzystwa Językoznawczego* XXII, 25–45.

Booij Geert, Rubach Jerzy (1987). Postcyclic versus postlexical rules in lexical phonology. *Linguistic Inquiry* 18(1), 1–44.

Czaykowska-Higgins Ewa (1988). Investigations into Polish morphology and phonology. Cambridge, MA: MIT. PhD dissertation.

Gussmann Edmund (1980). *Studies in Abstract Phonology.* Cambridge, MA: MIT Press.

Gussmann Edmund (2007). *Phonology of Polish*. Oxford: Oxford University Press.

Halle Morris (1959). *The Sound Pattern of Russian.* The Hague: Mouton.

Kiparsky Paul (1973). Abstractness, opacity and global rules. In *Three Dimensions in Phonological Theory*, Osamu Fujimura (ed.), 5–56. Tokyo: TEC Company.

Kiparsky Paul (1982). From cyclic to lexical phonology. In *The Structure of Phonological Representations* (Part 1), Harry van der Hulst, Norval Smith (eds.), 131–175. Dordrecht: Foris Publications.

Kiparsky Paul (1997). LP and OT. Ithaca, NY: Cornell Linguistic Institute. Handout.

Kiparsky Paul (2000). Opacity and cyclicity. *The Linguistic Review* 17(2–4), 351–365.

Lightner Theodore M. (1965). Segmental phonology of Contemporary Standard Russian. Cambridge, MA: MIT. PhD dissertation.

McCarthy John J., Prince Alan (1995). Faithfulness and reduplicative identity. In *Papers in Optimality Theory*, Jill N. Beckman, Laura W. Dickey, Suzanne Urbanczyk (eds.), 249–384. Amherst, MA: Graduate Linguistic Student Association.

Mohanan Karuvannur P. (1986). *The Theory of Lexical Phonology.* Dordrecht: D. Reidel.

Padgett Jaye (2001). Contrast dispersion and Russian palatalization. In *The Role of Speech Perception in Phonology*, Elizabeth Hume, Keith Johnson (eds.), 187–218. San Diego, CA: Academic Press.

Padgett Jaye (2003). The emergence of contrastive palatalization in Russian. In *Optimality Theory and Language Change*, Eric Holt (ed.), 307–335. Dordrecht: Kluwer Academic Press.

Padgett Jaye (2010). Russian consonant-vowel interactions and derivational opacity. In *Proceedings of the Eighteenth Formal Approaches to Slavic Linguistics: The Second Cornell Meeting* 2009, Wayles Browne, Adam Cooper, Alison Fischer, Esra Kesici, Nikola Predolac, Draga Zec (eds.), 353–382. Ann Arbor: Michigan Slavic Publications.

Plapp Rosemary K. (1996). Russian /i/ and /ɨ/ as underlying segments. *Journal of Slavic Linguistics* 4(1), 76–108.

Plapp Rosemary K. (1999). Lexical Phonology and Optimality Theory: Analysis of Russian. Iowa City, IA: University of Iowa. PhD dissertation.

Prince Alan, Smolensky Paul (2004). *Optimality Theory: Constraint Interaction in Generative Grammar*. Malden, MA: Wiley-Blackwell.

Rubach Jerzy (1984). *Cyclic and Lexical Phonology: The Structure of Polish*. Dordrecht: Foris.

Rubach Jerzy (1986). Abstract vowels in three-dimensional phonology: The yers. *The Linguistic Review* 5(3), 247–280.

Rubach Jerzy (1997). Extrasyllabic consonants in Polish: Derivational Optimality Theory. In *Derivations and Constraints in Phonology*, Iggy Roca (ed.), 551–581. Oxford: Oxford University Press.

Rubach Jerzy (2000a). Backness switch in Russian. *Phonology* 17(1), 39–64.

Rubach Jerzy (2000b). Glide and glottal stop insertion in Slavic languages: A DOT analysis. *Linguistic Inquiry* 31(2), 271–317.

Rubach Jerzy (2003). Polish palatalization in Derivational Optimality Theory. *Lingua* 113(3), 197–237.

Rubach Jerzy (2005). Mid vowel fronting in Ukrainian. *Phonology* 22(1), 1–36.

Rubach Jerzy (2008). An overview of Lexical Phonology. *Language and Linguistic Compass* 2(3), 456–477.

Rubach Jerzy (2011). Syllabic repairs in Macedonian. *Lingua* 121(2), 237–268.

Rubach Jerzy (2013). Exceptional segments in Polish. *Natural Language and Linguistic Theory* 31(4), 1139–1162.

Stieber Zdzisław (1973). *A Historical Phonology of the Polish Language*. Heidelberg: Carl Winter.

Szpyra Jolanta (1992). Ghost segments in non-linear phonology: Polish yers. *Language* 68(2), 277–312.

Wierzchowska Bożena (1963). Budowa akustyczna a artykulacja dźwięków mowy. *Biuletyn Polskiego Towarzystwa Językoznawczego* 22, 3–23.

Wierzchowska Bożena (1971). *Wymowa polska.* Warszawa: Państwowe Zakłady Wydawnictw Szkolnych.

Instytut Anglistyki
Uniwersytet Warszawski
ul. Hoża 69
00-681 Warszawa
[pawel.rydzewski(at)uw.edu.pl]