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# TABLE OF CONTENTS

**Artur Kijak**
On the Coronal Palatalization in Early Modern and Present-Day English . . . 5

**Marie Flesh**
"Dude" and "Dudette", "Bro" and "Sis": A Diachronic Study of Four Address Terms in the *TV Corpus* . . . . . . . . . . . . . . . . . . . . . . . . . . 23

**Marta Carretero**
The Expression of Epistemicity in British Internet Discussion Forums in Contrast with Newspaper Opinion Articles and Political Speeches . . . . 43

**Mersina Mujagić**
Figurative Conceptualizations of Nations, Countries, and Institutions in Newspaper Articles on Migration . . . . . . . . . . . . . . . . . . . . . . . 71

**Nazi Iritspukhova**
Metaphor and English Promotional Tourism Discourse: Systematic-narrative Hybrid Literature Review and Future Research Areas . . . . . . . . . . . . . . 93

**Hasnaa Hasan Sultan Abdelreheem**
The Key English Pronunciation Difficulties for Egyptian EFL Learners . . . 115

**Miłosz Marcjanik**
EMI in Higher Education: Current Challenges . . . . . . . . . . . . . . . . . . 135

**Katarzyna Jaworska-Biskup**
Food Symbolism and Imagery in the Polish Translations of William Shakespeare's *The Merry Wives of Windsor* . . . . . . . . . . . . . . . . . . 135

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# On the Coronal Palatalization in Early Modern and Present-Day English*

**Abstract:** In this paper we look at the case of coronal palatalization [t d s z] > [ʧ ʤ ʃ ʒ] in both Early Modern English (EModE) and Present-day English (PDE) with the aim to determine its major phonological factors (such as the context, triggers, etc.) and to explain the existence of numerous palatalized/unpalatalized variants found in different accents of contemporary English, e.g. [ʧuːn]/[tuːn]/[tjuːn]. It is argued here that the key to understanding the operation of palatalization in contemporary English is the change in the parameter setting which allows/disallows for the merger of two antagonistic elements within a single melodic expression – the *|U I| constraint. This Middle English (ME) innovation guarantees the coronals, to the exclusion of labials and velars, the right to undergo full palatalization. Moreover, the historical perspective adopted in this paper sheds some light not only on the linguistic micro-variation evident in contemporary accents of English, i.e. the existence of [ʧuːn]/[tuːn]/[tjuːn] variants, but also on the absence of front vowels from the group of potential palatalization triggers. It is pointed out that the evolution of the ME diphthong [iu] > [juː], a process which bears a direct responsibility for the later coronal palatalization and the growth of the heterogeneous forms in PDE, is a natural reaction to the *|U I| constraint.

**Keywords:** coronals, glide, palatalization, Early Modern English, Element Theory

## 1. Background

This paper investigates a single case of palatalization in PDE, that of coronal palatalization [t d s z] > [ʧ ʤ ʃ ʒ] as found in numerous contemporary varieties of English, e.g. General American (GA) *don't you* [doʊnʧə], *this year* [ðɪʃ jɪər] (Wells 2000; Bateman 2007).[1] More specifically, it aspires to contribute to a lively

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debate on the phonological conditions of the coronal full palatalization[2] which include the context, target(s) and trigger(s) participating in this assimilatory process (see, e.g. Escure 1976; Rubach 1984; Halle and Mohanan 1985; Borowsky 1986, and Jensen 2022). The process is assimilatory in that the consonants targeted by palatalization become more similar in their place of articulation to the segment that triggers palatalization. Additionally, coronal palatalization exhibits a shift in the manner of articulation where the stops become sibilant affricates, e.g. [t d] > [ʧ ʤ] (affrication). Generally speaking, the case of coronal palatalization fits into the broader phenomenon of consonant-vowel(vocoid) interaction that has been frequently reported in numerous languages (Kochetov 2011, 1674). However, in opposition to the previous analyses, the discussion here focuses primarily on the coronal full palatalization across word-boundary.

At first sight, the process under investigation looks like a typical example of full palatalization because it represents the most common pattern found cross-linguistically (Bateman 2007, 2011; Kochetov 2011). First, PDE palatalizes only coronals, the consonants that are the most common targets of palatalization in cross-linguistic studies. Second, the outcome of palatalization is once again a typical palato-alveolar affricate or fricative [ʧ ʤ ʃ ʒ]. On the other hand, however, while the front, high vocoids are statistically the most common triggers of palatalization (Bateman 2011; Kochetov 2011), it is only the front glide [j] that activates full palatalization in English. And although in some cross-linguistic studies (Chen 1973; Bhat 1978; Bateman 2007) glides are reported to be better palatalization triggers than vowels, the palatalization pattern found in English still deserves an explanation. In short, since in the cross-linguistic studies coronals are the most common targets and the front, high vocoids the most common triggers of palatalization, the question arises why in PDE coronals undergo full palatalization only before the glide [j],[3] e.g. *want you* [wɑːnʧ jə] vs. *want it* [wɑːnt ɪt]. This situation is surprising inasmuch as in Element Theory (ET), a model of the internal organization of segments which is adopted for the present analysis, the glide [j] and the front vowel [i] contain the same phonological material, i.e. while both of them are |I̲| segments, their different phonetic realization depends solely on syllabic affiliation: the element |I̲| is interpreted as [i] in the vocalic slot but as [j] in the consonantal position. It is assumed here that in order to understand why it is only the glide [j] that activates the full palatalization of coronals in PDE, it is necessary to refer back to the earlier stages of English development. This step will help us to explain the complex relation between coronals and the glide [j] in different varieties of PDE, e.g. *tune* [tuːn]/[ʧuːn]/[tjuːn].

Moreover, although in more recent studies (Bateman 2007; 2011) the cross-linguistic implicational palatalization scale of the type labial > coronal > dorsal has been replaced by a scale where coronals and dorsals are grouped together[4], the absence of velars among the targets of full palatalization in PDE still begs the question, even more so as the velars escape palatalization before the most common trigger, that is, the glide [j], e.g. *thank you* [θæŋk jə].[5]

Interestingly, while in historical English dorsals (stops and fricatives) were common targets of full palatalization, e.g. /k/ > [ʧ] Old English (OE) *cild* > PDE *child*, and /ɣ/ > [j] OE *gēar* > PDE *year*, in PDE they can at most face the fronting effect before front vocoids.[6] It simply means that in PDE the phonetic difference in the realization of the velar stop in *cool* and *keen* is phonologically irrelevant, i.e. it does not affect the internal structure of velars. The velar stop in the latter word is affected neither by secondary palatalization [kʲ] nor by obviously full palatalization [k] > [ʧ]. As such, it is without interest from the phonological perspective and will not be included in the following analysis.[7] The above discussion is important in so far as in some previous studies the explanation of the existence of implicational relations in palatalization (such as labial > coronal > dorsal) was phonetically motivated (e.g. Evolutionary Phonology, see Blevins 2004). For example, Guion (1998) argues that the common historical changes /k/ > [ʧ] and /t/ > [ʧ] before [i] are best explained as cases of misperception that are motivated by articulation. For her the common result of velar palatalization [ki] > [ʧi] does not have much to do with phonology; rather it should be attributed to common errors in the perception of fronted velars. Similarly, the scarcity of labial palatalization in the cross-linguistic studies is explained by the observation that listeners rarely make errors such as [pi] > [ʧi]. However, the misperception solution to full palatalization is problematic because it suggests that in English listeners stopped making perceptual mistakes at a certain point in time.[8] This is evidenced by the fact that velar palatalization, which was at one time an active phonological process, is now fully deactivated in PDE, e.g. *cute* [kjuːt].

The discussion in the previous paragraph leads us to yet another question of primary importance, namely, which palatalization changes meet the requirements for an active phonological process. This is a non-trivial question as in the literature there are instances of palatalization which some would recognize as phonological, e.g. velar softening /k/ ~ /s/ and /g/ ~ /ʤ/, e.g. *electri*[k] – *electri*[s]*ity, analo*[g] – *analo*[ʤ]*y*, and spirantization /t/ ~ /s/ or /ʃ/, e.g. *secre*[t] – *secre*[s]*y*, *par*[t] – *par*[ʃ]*al*. Such cases, however, do not conform to one of the core assumptions of Government Phonology (GP), that is, the Minimality Hypothesis (Kaye 1992b; 1995; Pöchtrager 2014). This principle guarantees that processes apply whenever their conditions are met. It means that exceptions, derived environment effects and extrinsic rule ordering are either the phenomena that are not related to the application of active phonological processes or are simply invalid procedures of constraining the application of such processes. It follows that pairs like *electri*[k] – *electri*[s]*ity* are assumed not to be related by any synchronic phonological processes but instead belong to separate lexical entries. Generally speaking, processes such as velar softening, spirantization, etc., are extinct in PDE and the alternations they produced are merely historical relics (Harris 1994, 27). In short, in this paper I closely adhere to the Minimality Hypothesis in that I recognize as phonological only those palatalization patterns that are exceptionless and phonologically conditioned. One of the consequences of this move is that only those cases of coronal palatalization that apply across word-boundary, e.g. *did you* [dɪʤ jə], are true phonological processes. What is more, since word-internally the full palatalization of coronals, e.g. *Tuesday* [ʧuːzdi], *virtue* [vɝːʧuː], *duty* [ʤuːti], *residual* [rɪˈzɪʤuəl], *issue* [ɪʃuː], seems to be lexically conditioned in that the pronunciation of such forms by the users of even the same accent may vary, e.g. *tune* [tjuːn] ~ [ʧuːn] and *Tuesday* [tjuːzdi] ~ [ʧuːzdi] (Wells 1982, 331; 2000; Minkova 2014, 144), they are not recognized here as cases of an active palatalization process. Rather they are assumed to have already been lexicalized in particular accents or in the pronunciation of individual speakers.[9] Nevertheless, the existence of different variants of the same form in different contemporary accents of English, e.g. *tune* [tuːn]/[tjuːn]/[ʧuːn], prompts the question of the origin of such coronal+*j* clusters in the history of English and their different developments. Surely, a historically-motivated explanation of the synchronic state of affairs is a highly questionable proposition, but certain (phonological) phenomena simply require a look back to understand the situation in a contemporary language (Backley and Nasukawa 2020). This diachronic approach seems necessary in the case at hand.

Summing up, in this broader perspective the paper examines cases of full palatalization of coronals in both PDE and EModE with the aim to explain the phonological conditions of the process and the major variants found in different varieties of contemporary English. More specifically, it discusses the following questions: 1) why does coronal full palatalization occur only before the glide [j]? 2) Why is it absent before the front vowels [i e]? 3) How to explain the diversity of forms with the historical coronal+*j* clusters in the contemporary accents of English? Additionally, we address the puzzle of the lack of labial and velar full palatalization in PDE. In order to understand the current situation, though, we must briefly refer back to the period of EModE in which coronal palatalization applied productively.

It will be argued that the key to understanding the intricacies of palatalization in English (both synchronically and diachronically) is the change in parameter setting responsible for the combination of two antagonistic elements within one segment, i.e. the *|U I| constraint (Section 4). This section is preceded by a short introduction to the ET model (Section 2), and the discussion of the relevant data in English (Section 3). Section 5 gives a summary of the findings in the paper.

## 2. Element Theory

The analysis of coronal palatalization, to be proposed in the following sections, is couched in Element Theory − a phonological model that employs a set of monovalent cognitive elements for the representation of segments (Kaye et al. 1985; 1990; Harris 1994; Harris and Lindsey 1995; 2000; Backley 2011). Elements are abstract units of structure representing internalized patterns (auditory images) which are directly associated with certain acoustic properties in the speech signal (1). Similarly to the traditional distinctive features, elements define natural classes of sounds, i.e. they express lexical contrasts and represent the properties that actively participate in phonological processes. However, elements differ from features in that they are associated with acoustic patterns in the speech signal rather than with articulatory properties (Backley 2017, 1). The standard version of ET adopted in this study (Backley 2011), employs a total of six elements: three resonance elements |I U A| and three non-resonance elements |ʔ H L|.

1. Acoustic properties of elements (adapted from Backley and Nasukawa 2020, 86)

   a. Resonance elements
   |I| low F1 with high spectral peak (F2-F3 convergence)
   |U| low spectral peak (lowering of all formants)
   |A| energy mass in center of frequency range (F1-F2 convergence)

   b. Non-resonance elements (source/laryngeal)
   |ʔ| abrupt and sustained drop in energy
   |H| aperiodicity, noise
   |L| periodicity, murmur

Crucially, the elements may appear in the melodic make-up of vowels and consonants. For example, a single element $|\underline{\mathrm{I}}|$ linked to a vocalic slot is realized as the vowel [i] (2a). The same element attached to the consonantal position is pronounced as the palatal glide [j] (2b). This means that the distinction between a consonant and a vowel is sometimes expressed only by the syllabic affiliation of a segment.

2. The representation of the vowel [i] and the palatal glide [j]

| | a. | b. |
|---|---|---|
| | N | O |
| | \| | \| |
| | x | x |
| | \| | \| |
| | $\|\underline{\mathrm{I}}\|$ | $\|\underline{\mathrm{I}}\|$ |
| | i | j |

As a consequence, each element has at least two different interpretations depending on the affiliation: a vocalic interpretation and a consonantal one. More generally, the resonance elements represent not only vowel distinctions but also place properties in consonants, while the non-resonance elements express tonal and laryngeal properties in vowels as well as the source and laryngeal properties of consonants (3).

3. Phonetic interpretation of elements in nuclear/non-nuclear position (Backley and Nasukawa 2020, 86)

a. Resonance elements

| *nuclear* | *non-nuclear* |
|---|---|
| \|I\| front vowels | coronal: dental, palatal place |
| \|U\| rounded vowels | dorsal: labial, velar place |
| \|A\| non-high vowels | guttural: uvular, pharyngeal place |

b. Non-resonance elements (source/laryngeal)

| *non-nuclear* | *nuclear* |
|---|---|
| \|ʔ\| oral/glottal occlusion | creaky voice (laryngeal vowels) |
| \|H\| aspiration, voicelessness | high tone |
| \|L\| nasality, obstruent voicing | nasality, low tone |

Elements are big enough to be interpreted in isolation but they can also combine to form compound expressions. Element combinations are asymmetrical in the sense that they form a head-dependent relation in which the headed element displays a stronger and more prominent acoustic pattern than the dependent (or non-head). One of the consequences of these asymmetrical combinations is that each element has at least two phonetic realizations, i.e. the head and non-head realization. For example, while the audible release phase in voiceless stops is represented by non-headed |H|, a headed element |$\underline{\text{H}}$| stands for aspiration which is a more salient form of stop release.[10] Similarly, the contrast between the voiceless labial /p/ and velar /k/ stops in the consonantal system of English is captured by the head-dependent relation in that the former consonant is represented as |$\underline{\text{U}}$ ʔ H|, while the latter as |U ʔ H|. Notice that velars and labials are represented by the same element |U|. Since, however, both categories are contrastive, they must have distinct structures. This distinction is captured by a difference in headedness in that labials have headed |$\underline{\text{U}}$| while velars have non-headed |U| (Backley and Nasukawa 2009; Backley 2011; Kijak 2017). Finally, even though elements are free to combine with one another within a single segment, certain combinations are more marked than others where the more marked ones simply represent cross-linguistically rare segments. The markedness is a direct consequence of the merger of two elements with contradictory acoustic properties. One example of such an antagonistic pair is the combination of |U| and |I| (formant lowering + high F2) which defines cross-linguistically rare segments such as the front rounded vowels [y ø] and the palatovelar obstruents [c ɟ ç ʝ].[11] In response to the recognition of such markedness constraints, the elements have been organized into two groups which are informally referred to as the dark |U A L| and light |I ʔ H| sets (Backley 2011, 200ff). Additionally, elements form three opposing pairs where each pair defines the polar values of three fundamental properties of spoken language: color, resonance, and frequency (Table 4).

4. The antagonistic pairs of dark and light elements (Backley 2017, 9)

| | **dark** | | | **light** | |
|---|---|---|---|---|---|
| *fundamental* | *value* | *element* | | *value* | *element* |
| color | dark | \|U\| | vs. | light | \|I\| |
| resonance | resonant | \|A\| | vs. | non-resonant | \|ʔ\| |
| frequency | low | \|L\| | vs. | high | \|H\| |

It is further assumed that even if a language allows for the merger of the opposing elements within one segment, only one of the elements of the antagonistic pair can play the head function.

Brief as it has been, the discussion of the theoretical underpinnings of the ET model finally allows me to introduce the elemental make-up of the English consonants and vowels (in (5) below), directly followed by the presentation of the linguistic data (next section). The representation in (5) contains only those segments that are directly relevant for the present study.

5. Internal structure of selected consonants and vowels in English

| | | | | |
|---|---|---|---|---|
| labial stops | /p/ | \|$\underline{\text{U}}$ ʔ H\| | /b/ | \|$\underline{\text{U}}$ ʔ\| |
| velar stops | /k/ | \|U ʔ H\| | /g/ | \|U ʔ\| |
| coronal stops | /t/ | \|A ʔ H\| | /d/ | \|A ʔ\| |
| coronal fricatives | /s/ | \|A $\underline{\text{H}}$\| | /z/ | \|A H\| |
| palato-alveolar fricatives | /ʃ/ | \|$\underline{\text{I}}$ $\underline{\text{H}}$\| | /ʒ/ | \|$\underline{\text{I}}$ H\| |
| palato-alveolar affricates | /ʧ/ | \|$\underline{\text{I}}$ ʔ $\underline{\text{H}}$\| | /ʤ/ | \|$\underline{\text{I}}$ ʔ H\| |
| palatal glide | /j/ | \|$\underline{\text{I}}$\| | | |
| front vowels | /i/ | \|$\underline{\text{I}}$\| | /e/ | \|$\underline{\text{I}}$ A\| |
| back vowels | /u/ | \|$\underline{\text{U}}$\| | /o/ | \|$\underline{\text{U}}$ A\| |

Some explanation concerning the phonological status of affricates in (5) is in order here. In what follows I take /ʧ/ and /ʤ/ to be segments which are phonologically identical to simple stops in that both categories are represented as non-contour structures. The only difference between these two categories is the way they are phonetically interpreted. More specifically, while in plain stops the release phase is short and may even be inaudible, affricated stops are realized with a prolonged burst (friction), accompanied by audible resonance. To put it differently, the delayed release in the case of affricates is recognized as a mere cue enhancement and hence it is not reflected phonologically as a contour structure of any sort (Cyran 2010; Backley 2011, 108).[12]

### 3. The evolution of the trigger of coronal full palatalization

Despite some instances of alleged full palatalization of coronals which are scattered through the early periods of English, e.g. OE *fecc(e)an* < **fetjan* 'to fetch',[13] *micgern* < **mid+gern* 'fat', *ortgeard* < **ort+geard* 'orchard'[14] (Minkova 2003, 110; Stenbrenden 2019, 712), the process began to operate productively only in EModE. The key reason behind this is that it was in ME that the [iu] diphthong started its gradual evolution towards a monophthong [iu] > [juː] > [uː] – a development which has been progressing ever since. More specifically, the emergence of the glide [j] is responsible for the appearance of numerous new consonant clusters in the language including that of the coronal+*j* type which later on undergoes full palatalization.[15] The productivity of the palatalization process is well illustrated by the fact that even though 18th century dictionaries record the coronal+*j* realizations in the vast majority of words (Beal et al. 2020), in contemporary dictionaries the same words are either listed with a palatalized coronal as the dominant pronunciation or at least it is noted as a local variant, e.g. *punctual*, *gradual*, *issue*, *casual*, etc.[16]

Without going into excessive detail, there are three major sources for the emergence of the [juː] sequence in EModE (6):

6. The source and evolution of the [iu] diphthong in EModE (Wełna 1978; Minkova 2014)[17]

| | |
|---|---|
| a. LOE [iː]+[w] > ME [iw] > [iu] > [juː] | *new, music, rule, Tuesday,* etc. |
| b. ME [ew] > [iu] > [juː] | *due, hue, brew, blue, crew,* etc. |
| c. OF [yː] > ME [iu] >[juː] | *duke*, *sugar*, *sure*, *glue,* etc. |

The developmental paths in (6) outline the main changes which lead to the emergence of the [juː] sequence in EModE. In ME the forms on the right in (6) above contained a variety of vowels [iw, ew, yː] which had evolved into a falling diphthong [iu] by the early 17th century.[18] More specifically, along with the [iw] and [ew] merger (6a-b), these native sources were enriched by a set of French words with a high front rounded vowel [yː] (6c), which was reanalyzed and adopted as [iu] (Minkova 2014, 268).

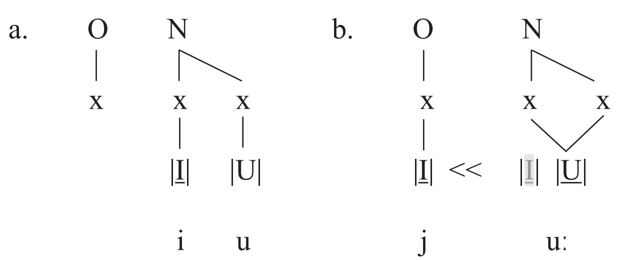
At the beginning of the 18th century the sequence [juː] < [iu] experiences further modifications as in certain contexts the glide element disappears, leaving a long monophthong [uː]. This glide-deletion process, which is known as Early Yod Dropping (Wells 1982, 206–208), applied widely after palatals, e.g. *chute,* *chew, juice*, the rhotic [r], e.g. *rude*, and consonant clusters, e.g. *plume, blue, fruit, cruise*. However, [j] is retained after labials, velars and the fricative [h] in the majority of accents, e.g. *mute, pure, view, cube, secure*, *human, huge*. The fate of the glide in the context after coronals is much more complex and multifarious. Thus, after the coronal sonorants [l n], fricatives [s z θ] and stops [t d] there "continues to exist widespread variation across regional accents, registers and individual lexical items" (Minkova 2014, 268). General American normally presents more widespread glide-deletion phenomena than British accents. It means that for many GA speakers the sequence [juː] which occurs after coronal consonants is either preserved or reduced to [uː] (a more frequent option), e.g. *reduce*, *attitude*, *news*, *enthusiasm*, *assume*, *presume*, *allude*, etc., fully palatalized variants are also possible, e.g. *situate*, *education*, *issue*, etc. (Wells 1982, 248). Interestingly, it is reported that the latter pronunciation tendency is gaining popularity in various London accents (Wells 1982, 330). The observation that full palatalization continues its conquest of the coronal+*j* sequences is evidenced by the growing tendency to apply the process to the same sequences across word boundaries in PDE, e.g. *this year* [ðɪʃ jɪər], *bet you* [beʧ jə], *did you* [dɪʤ jə], etc. Crucially, for the full palatalization to take place across word boundaries, the words must form a unified prosodic domain, that is, a clitic group with a single stress (Minkova 2014, 145).

The following section offers an explanation for the diverse developmental patterns of the glide in the [juː] sequences discussed above. More specifically, section 4 clarifies the retention of [j] after labial and velar stops (the lack of full palatalization) and its propensity to trigger full palatalization (coronal obstruents), and finally the same section proposes a constraint which provoked the evolution of the [iu] diphthong in ME. This constraint, as argued in Kijak (2022), is responsible for numerous developments in the history of English, e.g. velar full palatalization and vowel unrounding, both of which arguably took place in ME.[19]

## 4. Analysis

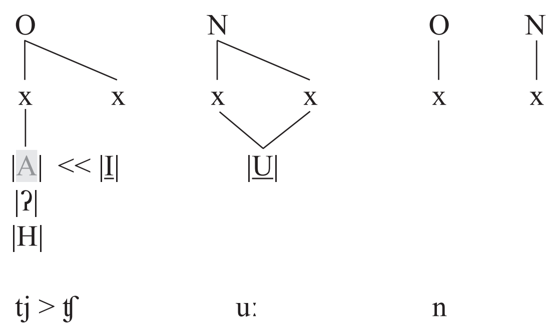
A reasonable conclusion which can be drawn from the discussion in the previous section is that the primary source of the coronal full palatalization in English was the evolution of the ME diphthong [iu]. Therefore, it is necessary to look at this development more closely in order to understand the real reason behind the disintegration process [iu] faced in EModE. Note that the diphthong [iu] is a complex melodic expression containing two antagonistic elements, that is, light |I| and dark |U|. Since both elements belong to the same fundamental category of color (see Table 4 above), only one of them can play the head function, hence [iu] is represented by the combination of the elements |I̲ U|. Now, in the distant past English unquestionably enjoyed the ability to merge these elements in a single melodic expression as evidenced by, for example, the presence of the front rounded vowels [y ø] in the vocalic inventory of both OE and (early) ME. These front rounded vowels are combinations of |I̲| and |U|, hence [y] |I̲ U| and [ø] |I̲ U A|. However, in ME the ability to merge the two elements must have terminated because the front rounded vowels disappeared from the language, i.e. they underwent unrounding: [y] > [i] and [ø] > [e]. The explanation for this change could be sought by assuming the existence of a parameter setting which allows or disallows the |U| and |I| merger in the language. This line of reasoning is taken by Kijak (2022) who argues for the presence of the *|U I| constraint in English. To put it briefly, Kijak (2022) claims that in OE/early ME the parameter setting is switched on, which results in a free co-occurrence of the elements of the antagonistic |U I| pair. Some evident results of this parameter setting include the secondary palatal articulation of velar stops [k] > [$k^j$] |U ʔ H| > |U I̲ ʔ H|, vowel *i*-mutation [u] > [y] |U| > |U I̲| and, generally, the presence of front rounded vowels in the OE vocalic system. All of them are a direct result of the ability to merge the elements |U| and |I|. Crucially, ME witnessed a turn towards the opposite setting which resulted in the affrication of secondary palatalized velars [$k^j$] > [ʧ] = |U I̲ ʔ H| > |U I̲ ʔ H̲| and vowel unrounding [y] > [i] = |I̲ U| > |I̲ U| and [ø] > [e] = |I̲ A U| > |I̲ A U|. In the cases at hand, the element |U| must go, as the |U I| combination is not allowed any more. Note that in both situations a stronger, headed element |I̲| survives, while the dependent |U| disappears. Summing up, the *|U I| constraint was activated in ME and it has been operating ever since. Now, coming back to the evolution of the ME diphthong [iu], the reason why it starts to disintegrate at this period becomes evident in the context of the above discussion. The *|U I| constraint starts to operate and in consequence the melodic expressions containing this antagonistic pair must react in one way or another. In the case of [iu], the clash between |U| and |I̲| was settled by shifting the latter element to the preceding Onset position and leaving the former one in the Nucleus. At this stage we arrive at the sequence [juː], the development of which is illustrated in (7).

7. The development of [juː] < [iu]



The |I̲| migration to the preceding Onset in (7b) is a direct consequence of the application of the *|U I| constraint introduced in ME. Since now it is linked to the consonantal position, the element |I̲| gets the glide [j] interpretation (see (2) above). Another consequence of this move is the lengthening of the remaining vowel [u] which becomes associated with two positions and hence is phonetically realized as the long vowel [uː], e.g. *tune* [tjuːn], *Tuesday* [tjuːzdi], etc. Furthermore, the consolidation of the newly formed glide was possible only if there was enough room for it in the Onset: compare *tune* [tjuːn] vs. *blue* *[bljuː], *crew* *[krjuː].[20] To put it differently, in a situation when both positions in the Onset were taken, the glide did not have a chance to survive and got dropped at an early stage (Early Yod Dropping, Wells 1982, 207).[21] A question immediately arises: why is it the headed |I̲| rather than the dependent |U| that shifts to the Onset position? The explanation may be sought in the asymmetrical behavior of the light and dark elements. More specifically, it has been proposed that the light elements |I ʔ H| have the tendency to appear at the left boundary of a prosodic domain (the beginning of a word, syllable domain) (Backley 2017, 9). In accordance with this tendency, the light element |I̲| of the [iu] diphthong moves to the left and colonializes the available Onset position – the initial step in which [iu] develops into [juː] (7a-b above). It can even reach as far as the first consonant (provided it is a coronal obstruent) and trigger full palatalization, e.g. EModE *tune* [ʧuːn], *issue* [ɪʃuː], etc. This final step is illustrated in (8) below.

8. Coronal full palatalization [tjuːn] > [ʧuːn]




In order to comply with the *|U I| constraint, the element |I̲|, which was originally part of the diphthong [iu] (7a), is moved to the left and becomes part of the branching Onset, e.g. *Tuesday* [tjuːzdi], *cube* [kjuːb], *beauty* [bjuːti], etc. (7b). This is not the end of the road for the element |I̲| as it may continue its leftward migration and colonize the initial position occupied by the coronal obstruent – palatalization stage, e.g. [tjuːn] > [ʧuːn] in (8).[22] Now, the reason why it is only coronals, to the exclusion of labials and velars, which may get colonized by the following glide and in consequence undergo full palatalization, is once again the change in the parameter setting. More specifically, if, as argued by Kijak (2022), the secondary palatal articulation is a prerequisite of full palatalization, the failure to undergo it in the case of labials and velars is a direct consequence of the *|U I| constraint (a ME innovation). In short, a situation in which the glide (represented by |I̲|) triggers the palatalization of labials (represented by |U̲|), is not possible in English because the merger of the antagonistic pair of elements is avoided. Moreover, a situation in which both elements of the antagonistic pair, which are members of the same (color) category (see Table 4), play the head function, viz. *|U̲ I̲|, is generally predicted to be impossible (Backley 2017).[23] Similarly to labials, the velar consonants are also represented by the element |U| but in a different function (dependent/non-head), see (5) above. Therefore, an explanation of why velars are not targets of full palatalization in EModE/PDE becomes clear at this stage of discussion. Just like labials, velars cannot undergo full palatalization because it would mean the violation of the *|U I| constraint. It will be recalled that the reason why in the history of English velars were affected by full palatalization on a massive scale is the parameter setting which was adjusted to the ability of combining both elements or simply the absence of the *|U I| constraint.

Finally, the absence of front vowels among the palatalization triggers in PDE must also be mentioned here. As argued above, the road to the full palatalization of coronals was initiated by the disintegration process of the ME diphthong [iu] which in response to a newly introduced constraint evolves into the sequence [juː]. In a situation when the glide joins the coronal obstruent in the Onset, the latter consonant becomes susceptible to full palatalization. Note that coronal full palatalization was a very productive process in EModE. For instance, Beal et al. (2020) report that in some 18th century dictionaries, e.g. Sheridan 1780 (also Walker 1791), the majority of coronal+*j* clusters are recorded as fully palatalized. The explanation why most of the 18th century dictionaries systematically record unpalatalized variants may lie in a strong prejudice towards palatalization displayed by their authors. This resulted in a long-lasting stigmatization of palatalized forms, the consequence of which is the observed divergence in contemporary accents, e.g. [tuːn]/[tjuːn]/[ʧuːn]. However, the productive status of the coronal full palatalization in EModE can be confirmed by the growing tendency to apply the process across word-boundary in PDE, e.g. *meet you* [miːʧ jə], and the popularity of the palatalized forms recorded in up to now conservative (London) accents, e.g. *Tuesday* [ʧuːzdi] (Wells 1982). What is important for the present discussion, however, is that the coronal full palatalization was initiated by the glide [j], the process applied productively to the coronal+*j* sequences in EModE (prescriptive tendencies put aside) and is continued in PDE in a situation when the coronal obstruent occurs in front of the glide across word boundary, e.g. *bet you* [beʧ jə]. It simply means that in opposition to [j], front vowels have never been among the triggers of coronal full palatalization, a tendency which is preserved in PDE. As already mentioned (in footnote 2 above), this situation is not uncommon from a cross-linguistic perspective (Chen 1973; Bhat 1978).

## 5. Conclusions

This article has argued that the coronal full palatalization, a process which expanded rapidly in EModE and is continued in PDE (across word boundary), is an indirect effect of the *|U I| constraint – a ME innovation. Due to the working of this constraint, English lost front rounded vowels (vowel unrounding), the palatalized velars underwent affrication and the ME diphthong [iu] evolved into [juː]. In the latter development, in a situation when the glide happened to arise in the context of a coronal obstruent, some further modifications took place. For example, while the glide was generally dropped in GA, e.g. [tuːn], it was normally retained in British English, e.g. [tjuːn]. Moreover, the glide could trigger palatalization of the preceding coronal while at the same time being either lost or retained itself, e.g. [ʧuːn] and [pʌŋkʧuəl]/[pʌŋktʃjuəl]. It has been suggested that the key to understanding this developmental diversity of the coronal+*j* clusters, which is commonly reported to exist even among the speakers of a single accent, can be found in prescriptive tendencies and the stigmatization of the palatalized forms as vulgar from the very beginning of their emergence. More generally, it has been shown that the arrival of the glide [juː] < [iu] contributed to the formation of various new clusters in EModE including coronal+*j* clusters. While the glide was generally retained after labial and velar consonants, e.g. *pupil* ['pjuːpᵊl], *cure* [kjʊᵊr], it acted as a palatalization trigger of the preceding coronal, e.g. *issue* [ɪʃuː]. Although narrowed down to the word boundary context, the coronal full palatalization is continued in PDE and it has been gaining popularity among the speakers of various English accents (including conservative RP speakers). It has been pointed out that this historical background of the coronal full palatalization, i.e. ME [iu] > EModE [juː], may shed some light on the absence of front vowels among the palatalization triggers in PDE. It does not matter whether it is the effect of some historical development [iu] > [juː] or not; the glide has always been the only trigger of the coronal full palatalization in English. This pattern is not uncommon in the cross-linguistic studies. Finally, it has been argued that the reason why it is only coronals, to the exclusion of labials and velars, which are the targets of full palatalization in contemporary English is the introduction of the *|U I| constraint to the language. Since this constraint guarantees the inability to merge two antagonistic elements within one segment, the labials |<u>U</u>| and velars |U| are not among the potential targets of the secondary and so also the full palatalization in PDE.

## Notes

1 Note that while triggering the palatalization of the preceding coronal across the word boundary, the glide [j] is either retained, e.g. [ðɪʃ jɪər] or totally merged with the preceding consonant, e.g. [doʊnʧə]. My best guess is that it is

related to the tempo of speech and/or individual speaker's preferences. Since, however, it does not have any direct consequences for the proposed analysis, in what follows I am going to transcribe such examples with the glide.

2 After Bateman (2007, 2), I adopt the distinction between full palatalization, e.g. [t] > [ʧ], [k] > [ʧ] and secondary palatalization, e.g. [t] > [tʲ]. In the latter scenario, a consonant acquires a secondary palatal articulation without any shifts in the primary place and/or manner of articulation.

3 See Borowsky (1986, 308) who grapples with the same problem.

4 Bateman (2007; 2011) argues that Chen's (1973) palatalization scale according to which the presence of coronal palatalization presupposes dorsal palatalization within the same phonological system is too restrictive and so she proposes to replace it with a less restrictive one: labial > coronal and dorsal.

5 A new analysis of the full palatalization of velars in the history of English and the lack of it in PDE is proposed in Kijak (2022), cf. Escure (1976).

6 Just as in the case of labials, the fronting of dorsals before the front vowels and [j] in PDE does not qualify as a phonological process. In other words, the fronting is assumed here to be merely a phonetic effect without any influence on the internal structure of segments and hence it lies outside phonology proper.

7 The gradient fronting of /k/ before front vocoids is fully automatic and is part of universal phonetics, i.e. it is shared by all languages (Hyman 1975, 171).

8 A reviewer has rightly pointed out to me that this does not seem to be a problem if one makes the additional assumption that there has been a change in the coarticulatory patterns of English towards less gestural overlap (e.g. Smith et al. 2019; Stevens and Harrington 2022). This would predict fewer perceptual errors, which could lead to the deactivation of velar palatalization.

9 This situation is further complicated by the fact that the forms with the fully palatalized coronals were recognized in the past as vulgar, for example in Received Pronunciation (RP), and stigmatized (Beal et al. 2020). This situation may sometimes lead to hypercorrection, e.g. just [djʌst] (Wells 1982, 331).

10 By convention the underlined elements represent heads.

11 Backley (2011, 39) reports that 'front rounded vowels such as [y ø] are found in less than 7 per cent of the world's languages.' Similarly, both palatovelar stops [c ɟ] and fricatives [ç ʝ] are rather limited cross-linguistically (Backley 2011, 101).

12 For a recent overview of the literature on the representation of affricates, see Lin (2011). For a different representation of affricates in a recent version of GP (GP 2.0.), see Pöchtrager (2021).

13 Hogg (1992, 270–272) assumes that the dental stop+*j* spellings, which are common in late West Saxon, confirm the affricated realization as early as the ninth century.

14 Since Stenbrenden (2019) argues for the late arrival of [ʤ] in English (Late

ME), which on its road to affricate went through the [dj]/[dʝ] stage, viz. [ɟɟi] > [ɟj] > [dj]/[dʝ] > [ʤ], her reconstruction could be used to mark the beginning of coronal palatalization which started to operate on a large scale only in EModE.

15 This process is also known as yod coalescence (e.g. Wells 1982; Beal et al. 2020).

16 For an exhaustive comparison and illustration of the forms containing the coronal+*j* clusters in 18th century dictionaries, see Beal et al. (2020, 519ff).

17 In (6) LOE and OF stand for Late Old English and Old French, respectively.

18 The [iu] diphthong has survived in the conservative Welsh English and some American varieties (southern and New England). For example, in the former accent there is still a distinction between *threw* [θriu] and *through* [θruː] which are homophones in other accents (Wells 1982, 206).

19 The idea that the full palatalization of velars [k g] > [ʧ ʤ] occurred in ME is advocated in Minkova (2003; 2016; 2019), Stenbrenden (2019) and Kijak (2022).

20 The same argument was used in the discussion concerning the status of s+C(C) consonant clusters in English, see Kaye (1992a); Harris (1994, 61ff); Gussmann (2002, 113).

21 This is only one of the reasons of the Early Yod Dropping as the glide was also lost after palatals and [r], e.g. *chute*, *rude* (Wells 1982, 207).

22 I leave the question open for further discussion whether on their road to full palatalization, the coronal obstruents pass through an intermediate stage, that is, secondary palatal articulation, e.g. [tj] > [tʲ] > [ʧ]. However, in the light of recent findings (Kijak 2022), I think this is perfectly possible.

23 It may explain the universal ban on labial full palatalization (Bateman 2011; Kochetov 2011; Backley 2017, 13).

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