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Palatalization: a persistent rule of English

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It is not unusual to find in a language certain recurrent types of rules that operate with similar effects at different points in the grammar (and historically, at different points in time). Such rule persistency provides an indication as to what constitutes natural processes. It is important, however, to differentiate between universal phonetic tendencies - which are present in all languages and at all stages of a given language-, and more fundamental processes, which are part of a language- phonology, and interact with other phonological rules. All languages have low-level, assimilatory processes, reduncancy rules which apply at any point in a derivation whenever their structural description is met. For example, all languages have a certain degree of vowel-nasalization before a nasal consonant, or a slight consonant-fronting before a front vowel: Modern English has phonetic nasalized vowels, as in [wɪ̃Dr] winter. The back stops /k/ and /g/ have two allophonic variants: a palatal stop as in key, geese, and a velar stop as in cool, goose. The same palatal allophones are evidenced in Modern French qui [k'i], gui [g'i], as opposed to cou, gôû. But in some languages, such universal phonetic statements become phonological processes: nasalized vowels are phonemic in French (but not in English). In English, certain consonants in the fronting environment have undergone a more fundamental palatalization which results in affrication and/or spirantization.

In this paper, I will focus upon the latter process, which yields morphophonemic alternations as evidenced in create/creation; allude/allusion. I will point out various instances of palatalization in English, and determine to what extent the scope of palatalization and the conditions triggering it have changed from Old English to Modern English. Finally, it will be shown that the directionality of palatalization, as well as of other similar processes is best characterized by incorporating the notion of phonological strength as a significant parameter in a theory of language change.

1. Palatalization in Old English.

In Old English,¹ palatalization affected the velar stops /k/ and /g/ and their geminates in the environment of a front vowel or glide, changing the geminates respectively to the voiceless and voiced affricates [ç] and [j], the voiceless stop /k/ to the voiceless palatal affricate, and the voiced /g/ to a voiced palatal glide [y]. OE palatalization appears furthermore to be both a prevocalic and a postvocalic process, in the sense that it may be conditioned by a preceding or a following segment. Examples of word-initial (prevocalic) palatalization are:³ ċeorl 'churl', ċirice 'church', ċiese 'cheese', ġeard 'yard', ġiefan 'give',

geolu 'yellow'. However, there are forms opaque to palatalization, as shown in ges 'geese', cyning 'king', gylden 'gilt', in which the velar is followed by a non-historical front vowel, that is, a vowel derived by i-umlaut - which is another productive process of Old English phonology.

The two OE synchronic rules which account for the above-mentioned items may be formulated as follows:⁴

Palatalization:

$$\begin{bmatrix} +\text{obst} \\ +\text{back} \\ \alpha\text{voice} \end{bmatrix} \rightarrow \begin{bmatrix} -\text{back} \\ -\alpha\text{strid} \\ \alpha\text{cont} \end{bmatrix} / \sim \begin{bmatrix} -\text{cons} \\ -\text{back} \end{bmatrix}$$

(a velar stop is palatalized [k → č; g → y] in the environment of a front vowel or glide)

i-Umlaut:

$$\begin{bmatrix} -\text{syll} \\ +\text{back} \end{bmatrix} \rightarrow \begin{bmatrix} -\text{back} \end{bmatrix} / -\text{C} \begin{bmatrix} -\text{cons} \\ -\text{back} \\ +\text{high} \end{bmatrix}$$

(a vowel is fronted if a high front vowel or glide occurs in the following syllable)

A counterfeeding order is clearly required to hold between Palatalization and Umlaut, so as to prevent palatalization in the case of cyning < *kuning, ges < *gosi or gylden < *guldjan.⁵ The same ordering accounts for the occurrence of word-medial palatals, although the conditioning element has been lost in most cases. A necessary condition for the ordering Palatalization-Umlaut is that the glide or vowel which triggers both rules be lost after those rules have applied. This is illustrated in the following derivations.⁶

	/kuning/	/gōsi/	/sōkȳan/	/bōki/
Palat	---	---	sōčȳan	bōči
Umlaut	kūning	gōsi	sōčȳan	bōči

[kining] 'king' [gēs] 'geese' [sečan] 'seek' [bēč] 'books'

(after i/y deletion and vowel-unrounding)

The same derivation accounts for OE šyncan/Got. punkjan 'seem', OE drenc < *dranki 'drink', OE sengan < *sangjan 'sing', as well as for the absence of palatalization represented in such items as OE locian 'look' from /lōko-ja-n/ to which Palatalization is not applicable, although Umlaut is, which yields /lōki-ja-n/, then [lōkian].

There is thus clear evidence as shown in opaque forms like locian, ges, cyning, that in OE, Palatalization is not a synchronically persistent rule in the sense of Chafe (1968), i.e. it does not apply at several points in the derivation, whenever its structural description is met. On the contrary, Palatalization appears to be crucially ordered with respect to i-Umlaut.⁷

On the other hand, there are items in which Palatalization definitely seems to be a postvocalic process, i.e. conditioned by a preceding front vowel, as in faeġr 'fair', regn 'rain', daeġ 'day', maeġ 'may', iċ 'I', hwilċ 'which', halig 'holy', bregdan 'move swiftly'. In all of those words, no following underlying front vowel may be postulated.⁸

Another peculiarity of OE palatalization should be noted, namely that /g/ palatalizes after any front vowel (bregdan, daeġ), whereas /k/ does only after a high front vowel (iċ, hwilċ).⁹ Thus /g/ and /k/ offer a variable sensitivity to palatalization: /g/ is clearly more 'palatalizable' than /k/, and /i/ is more likely to trigger palatalization than other front vowels. Finally, it is important to stress again that only velars were affected by palatalization in OE. That OE dentals (or alveolars) and labials were not, is evidenced in the following set which show the Gothic forms (including a conditioning glide) and the Old Saxon forms (in which the stem-vowel has been umlauted, but the glide preserved), beside the Old English cognates (where Umlaut has applied across all consonant-types, with subsequent loss of the glide):

Gothic	OSaxon	OE	
skapjan	skeppjan	scieppan	'create'
satjan	settjan	settan	'set'
gramjan	gremmjan	gremman	'irritate'
saljan	selljan	sellan	'give'
but			
rakjan	rekkan	reċċan	'reach'
lagjan	leggjan	leċċan	'lay'

The hierarchical pattern evidenced in OE palatalization may be summarized as follows:

1. only velars are palatalized
2. /g/ is more palatalizable than /k/
3. /g/ becomes a glide [y] or is deleted, whereas /k/ becomes an affricate.
4. /g/ is palatalized after any front vowel, whereas /k/ is affected only after /i/
5. /i/ or /y/ are more likely to trigger palatalization than other front vowels.

2. Modern English palatalization

Although Old English velars were the only segments to be affected by palatalization, the process has been extended to alveolars in Modern English. The palatalization of alveolars in Modern English has proceeded in a series of chronological steps: as early as the fifteenth century, there is orthographical evidence that alveolar fricatives become palatalized, first medially, as in sesschyonys 'sessions', conschens 'conscience', ishu 'issue', condishon 'condition', then initially (late sixteenth and middle seventeenth century) as in sheute 'suit', shur 'sure', shugar 'sugar', as in assume assure, consume.¹⁰ In all cases, the following front glide, mostly derived from French [ü] as [yu], or from [ỹ] conditions this palatalization. Furthermore, there is evidence in the spelling that the conditioning glide is lost after it has triggered palatalization, in the same way as in OE. Later, in the seventeenth century, palatalization spreads to the voiced alveolar stop before a glide in soldier (written sawgears in Machyn, sogers in Verney Memoirs, 1642), tedious (teges), Indian (injan). In twentieth-century English, palatalization is very productive in morphological alternations. It yields alternations between final alveolar stops or fricatives and palatal fricatives before certain derivational suffixes underlyingly including a high front glide. It follows that all apparent instances of the modern regular palatalization process occur in medial position, as shown in the following pairs:

t/ʃ	act/action	d/ʒ	explode/explosion
	promote/promotion		decide/decision
	create/creation	d/ʝ	Canada/Canadian/Cajun
t/ʃ	innate/nature		creed/credulous
	right/righteous	s/ʒ	regress/regression
		z/ʒ	aphasic/aphasia
			seize/seizure

Clearly, palatalization affects alveolars in Romance borrowings. Labials remain unaffected, as illustrated in incipient, Albion, Arabian, opium, aviation, devious, amphibious, ruffian.

As to velars, they hold an interesting double status: there are cases of phonetic palatal/nonpalatal alternations similar to those involving alveolars; for example, a [g]/[ʝ], alternation obtains in rigor/rigid, regal/regicide, analogous/analogy, and a [k]/[ʃ] alternation in delicate/delicious, music/musician. On the other hand, a number of items (which do not alternate morphologically) show no evidence of palatalization, e.g. figure, speculate, peculiar, secular, articulate. At closer look, it appears that the first set of items, those which show g/ʝ or k/ʃ alternations, were borrowed from Romance as items with a palatal/nonpalatal alternation already there: g/ʝ (cf. Modern French rigueur/rigide [riɡœr] / [riʝid], analogue / analogie [analog] / [analoʝi]), or with a k/s alternation [cf. Modern French délicat / délicieux [delika] / [delisyø], musique / musicien [müzik] / [müzisyẽ]. The English k/ʃ (from French k/s) alternation is a

case of alveolar palatalization (similar to what happens in regression. The items in the second set were not palatalized when borrowed (cf. French figure [figür], spéculer [speküle], ambigu [äbigü]), and were not in English subsequently. The obvious conclusion is that in Modern English velars appear to be resistant whereas alveolars seem to be particularly sensitive to that very same process. This is clear because even items which were borrowed from French alveolar stops were palatalized in English (cf. Engl. credulous [kreʃʊlas]/French crédule [kredül], Engl. nature [neʃðr]/Fr.[natür], Engl. creature [kriʃðr]/Fr.[kreatür].¹¹ Finally, it is worth noting in this brief outline of Modern English palatalization that the process under consideration typically occurs after a stressed vowel in standard dialects. Compare for example associate, where it is optional to palatalize [a'sosyet]~[a'soʃet], and association - where palatalization does not occur, in pretonic position. See also induce, reduce, produce.., and of course the set of words with word-initial alveolars which precede a stressed vowel, e.g. due [dyu]~[du], tune [tyun]~[tun]. To summarize the conditions governing Modern English palatalization:

1. Only alveolars are actively palatalized, but not velars or bilabials.
2. Palatalization has affected alveolar fricatives in medial and initial position, but alveolar stops only in medial position, after a stressed vowel.
3. Palatalization is conditioned solely by the high front glide /y/.

3. Palatalization as weakening.

An implication pattern appears to pervade the diachronic spread of palatalization in English. To summarize the major differences: In OE palatalization is restricted to velars. In Modern English, the rule affects alveolars, but is restricted to single prevocalic consonants, and furthermore appears to be constrained by certain suprasegmental properties- namely it applies only after a stressed vowel at least in standard dialects. We may wonder at this point if there is anything systematic motivating this pattern. In other words, is this pattern attested in other types of change?

Palatalization, as outlined above, is basically a type of assimilation of a consonant to a high front vowel-- e.g. a consonant gradually acquires the properties of the adjacent vowel. In this case the consonant not only acquires the cavity features of the vowel., i.e. its nonhigh, nonback value, but also its major-class features. (Continuancy, then nonconsonantal value, and the ultimate development is deletion.) This is indeed what happened in Middle English in fægr > fair, stiġan > stien > stien 'ascend', twiġa(es) > twies 'twice', leogen > leien 'to lie down'. This kind of development is characteristic of lenition, or consonantal weakening. Palatalization is merely one of the ways in

which a consonant may weaken. A parallel process, widely productive in OE, too, is labialization, which is conditioned by an adjacent back round vowel, and also restricted to velars and leads to a development including $g > \gamma > w > \emptyset$, as in *dragan* > *drayen* > *drawen* 'draw, or *fugol* > *fuyel* > *fuel* > *fou(e)l* > 'fowl' or again *folgian* > *folyen* > *folwen* > 'follow'. Thus the development of palatalization in English, as well as in many other languages, can at least partly be explained if reference is made to hierarchies of strength relations between segments. In this sense, the concept of phonological strength should not only be considered as a parameter of a theoretical system, but also as a determinant in the directionality of diachronic change.¹² In other words, strength refers to the degree of resistance offered by a given segment to a particular phonological process, whereas the reverse notion of 'weakness' refers to the tendency of a segment to undergo a given phonological process. According to most hierarchies proposed so far, weakness or strength can be measured in terms of (1) major class features, (2) environment, (3) cavity features. (1) Major class features. It is posited that fricatives are weaker than stops: Note that in Middle English, palatalization has affected the alveolar fricatives before the alveolar stops. (2) Environment. An intervocalic environment favors lenition. Most of the original environments in which palatalization occurred were intervocalic, although they later overtly appeared as final, following flecational loss. An additional feature promoting weakening is, at least in English, the presence of stress in a preceding syllable. As noted above, in standard varieties of Modern English, alveolars are palatalized after a stressed vowel and before the glide /y/. In fact the rule applies across a morpheme boundary, but interestingly enough is extended to apply also across word-boundaries in allegro tempo speech. For example *bet you*, *bless you*, *just yet*, *last year* may be realized as, respectively, [bɛʃu], [b lɛʃu], [læsʃɔr]~[læsɪr] [ʃæsɛt]. In all cases, an underlying glide /y/ triggers the palatalization of the preceding consonant across a word-boundary. Thus, the rule becomes purely phonologically conditioned. Finally, an interesting question involves the behavior of velars and alveolars in word-initial position in Modern English. Clearly, as mentioned above, a glide-deletion rule follows palatalization in a counterbleeding order in the case of intervocalic velars and alveolars as shown in *Indian*/indyɔn/ → /inʃyɔn/ → [inʃɔn] and *betcha* /bɛtʃya/ → /bɛtʃyð/ → [bɛtʃð]. Some dialects of English (British and American) and fast speech varieties have extended both rules to apply to word-initial consonants. For example, the older forms which I set up as the underlying forms in all dialects are /dyu/ and /tyun/ for *due* and *tune* - there are now dialectal forms like [ɕyun] or [ɕun] for *tune*; [ʃyu] or [ʃu] for *due*, which alternate in British and American dialects with [tyun], [dyu] and with [tun], [du] - the latter having become standard in American English. When [tyun] and [dyu] occur phonetically, they are opaque to both Palatalization and Glide-Deletion, as these

two rules are no longer restricted to apply across morpheme boundaries. I noted earlier their generalization to interlexical sequences as in betcha. If those rules are no longer morphologically conditioned, there is no reason for initial consonants not to be affected - thus the two developments observed in certain dialects - namely initial affrication ([ʧun]), or glide deletion ([tun]), may be interpreted as an effort to reduce opacity. In the first development, Palatalization counterbleeds Glide-Deletion to yield [ʧun]; but in other dialects, Glide-Deletion bleeds Palatalization to yield [tun] as shown below.

	/tyun/		/tyun/
Palat	ʧyun	Gl-del	tun
Gl-del	ʧun	Palat	---
	[ʧun]		[tun]

If it is true that the form [tun] is innovative with respect to [ʧun] (and [tyun]), then this implies a reordering from a counterbleeding to a bleeding order with no gain in transparency (since both forms [ʧun] and [tun] are transparent, as opposed to [tyun]). This type of reordering conflicts with Kiparsky's principle of minimization of bleeding orders (Kiparsky 1968, 1972). We may wonder what may have motivated this marked reordering. I suggest that the marked relation which holds between Glide-Deletion and Palatalization can be explained in terms of the structural strength of certain positions, and in particular by reference to the resistance of word-initial consonants to weakening processes. Thus, if it is true that a word-initial position is a strong position, one of the ways in which this strength may be exerted would be by reordering a pair of rules from the unmarked order to the marked order, so as to bleed the rule promoting weakening. This is presumably what happened earlier in the 19th century to word-initial velars: There is evidence of the phonetic palatalization of both velar stops in initial position in the 18th and 19th centuries (Dobson 1957:952, Wyld 1956:310). This phonetic palatalization was reflected in the presence of the glide [y] following a velar stop. Thus kind, can, get, begin were pronounced [kyæynd], [kyan], [gyet], [bəgyin]. This pronunciation is still attested in Jamaican English [kyat] for cat, [gyadɪ] for garden. However [ky] and [gy] were 'expelled' in the late 19th century, which formally implies the loss of the postvelar glide, so as to prevent further reduction of the velar by palatalization. New sequences of [ky], [gy] as in cue, cute, curious, gules as well as initial labials (few, pew) do not show evidence of such a constraint, which seems to confirm that in Modern English, palatalization is an active process only with respect to alveolars.

(3) Cavity features. In most analyses, velars are considered to be the weakest, thus the most prone to reduce, either by

palatalization, or labialization, or any other way. This proves true in OE, but also widely in the Romance languages, in which both processes are restricted to velars and dentals (cf. Latin fu-gire 'flee', Rum. [fuʃi], It. [fuʃfire], Port. [fuʒir], Fr. [fʏir], Spanish, huir) as well as in Faroese, Turkish, Dravidian, in Finno-Ugric and Samoyed languages, in Tahitian etc.... It is also true that, for English at least, labials seem to be the strongest segments, since in Modern English, both velars and alveolars, but not labials have undergone palatalization. In French and Spanish, velars and dentals have deleted in intervocalic position, but not bilabials. However, it is usually implied that if a weakening process spreads - say, first to velars, then to alveolars, it will continue to affect velars while affecting alveolars -- this is where the English data involving Palatalization show an unexpected diachronic strengthening of velars as opposed to alveolars. There is further evidence that in English, alveolars are particularly sensitive to weakening, the D-Flapping rule is a case in point (see writer [rayDr] in which the intervocalic stop is weakened to the voiced glide [D]). Can it be then, that a language may change in terms of the inherent strength of its segments? The development of palatalization in English suggests that it may. In any event, it seems that the concept of phonological strength should be incorporated in any theory of language change---in the form of hierarchies of segments and environments for example -- because it can sharpen the notion of "persistency" by explaining the varying frequencies and conditions in the occurrence of certain well known persistent rules. For example, it has been shown that a marked reordering which removes and prevents palatalization in initial position can be explained in terms of the inherent strength of initial segments, which thus blocked weakening in this manner. This device occurred at least twice in the development of English. On the other hand palatalization as weakening spreads freely in intervocalic position (as does Flapping) which is thus a weak position. Finally there is evidence suggesting that the inherent strength of certain segment classes can change in the course of a language history. Velars which were the weakest in OE (subject to extensive palatalization and labialization) are now stronger than alveolars. Research in the histories of other languages should indicate whether this shift of inherent strength is a common phenomenon.

FOOTNOTES

*I am grateful to Larry Mitchell for discussing this paper with me. I alone, however, am responsible for whatever error may occur here.

1. See Campbell (1959), Wright (1905) Lass and Anderson (1975) among others, for general information.

2. There is no clear evidence as to the exact phonetic status of < g > in Old English. It is often assumed that Germanic < 3 > was in OE a palatal spirant [y] or a velar spirant [ɣ], depending on the environment. But then a later rule is required to despirantize [y] or [ɣ] in initial position (geese, goose). In this analysis, I assume for clarity of exposition that the historical segments /g/ and /k/ are underlying in a synchronic grammar of OE.
3. < ċ > is the traditional graphemic representation for OE [ç], and < ġ > stands for [ɣ]. Gothic < j > also refers to [y]. The OE grapheme < y > represents the front rounded vowel [y]. I will use phonetic symbols (between brackets) whenever it is crucial to represent the output of a given rule. Otherwise, I will use graphemic forms, as usually given in the literature.
4. See Lass and Anderson (1975) for a similar formulation.
5. The underlying forms are historical forms (Gothic for example) or reconstructed forms (*).
6. Various traditional statements of OE palatalization wrongly imply an ordering paradox in OE by assuming that medial palatals were conditioned by a preceding front vowel, derived or not by i-umlaut, whereas initial velars were not affected by a following umlauted vowel. See for example Campbell's statement (1959:174): "k and g were palatalized after OE front vowels, including those due to i-umlaut..."
7. Another possibility in this case would be to allow Palatalization and Umlaut to apply simultaneously. But deciding on the issue of ordering is not crucial to the point under consideration.
8. The possibility of postvocalic palatalization is represented in the rule given above by the notation ~ $\begin{bmatrix} -\text{cons} \\ -\text{back} \end{bmatrix}$, which implies that the glide or vowel may precede or follow.
9. This further detail is incorporated in the rules given by Lass and Anderson (1975).
10. Wyld (1963:210) who mentions various sources: Marg. Paston (1469); Thos. Pery (1539); Sir Thomas Seymour (1544); Cooper (1685); Alleyne Papers (1593); Jones (1701); Walker (1801) ...
11. The various alternations (t:ʃ/č; d:ž/ĵ) are also accountable in terms of the original status of the borrowed items. Items borrowed with French [s] or [z] later had [ʃ] or [ž] reflexes in English, and French [t] and [d] became [č] and [ĵ] in the palatalizing environment.
12. See Foley (1970), Hooper (1974), Escure (1975) for a discussion of hierarchies in relation to historical change.
13. Grammont (1902), Jakobson (1942), Zwicky (1972), Foley (1970), Escure (1975).

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