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Palatalization in English with Reference to Arabic

ABSTRACT

Palato-alveolars are considered as a significant area for phonological features investigation in both English and Arabic. This set of phonemes in English is defined by either an output of French borrowing influence like the case of [ʒ] or of a palatal assimilation within the words or at their boundaries under conditions of phonetic environments. The current study sheds light on accounts of palato-alveolars and their origins and illustrating the process of palatalization in English and Arabic. Since such phonemes are the product of constriction made by co-articulation of several organs, Articulation-Based Feature Model is implemented to be applied on words taken from Iraqi Arabic and some Qur'anic expressions which motivate the spread of features to produce constriction or stricture whereby place of articulation for some palato-alveolars is shifted due to the environment in which they occur.

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Historical Survey:

The Proto-Germanic that is considered the ancestor of English did not have any affricate sounds. The appearance of the affricates [ʧ], [ʤ]and [ʃ] in Old English innovated a new contrastive place of articulation represented by a palatal gesture **(Alhjouj, 2016: 107)**. It is assumed that velar stops are the possible sounds that undergo palatalization in phonological environments. Front vowels are to be believed as the main factors which motivate the palatalization of those phonemes (ibid: 108). The graphs <c> and <g> were used in OE to represent both velars and palatals. Generally, <c> represented [k] and [ʧ]. While <g> was used to stand for voiced [g] and the approximant/ j/depending on the combination in which they occur as in:gōld (gold), geoð/ geon (youth),/k/as in: cyning (king) and [ʧ]: cyse, cēse (cheese) (ibid: 109-110).

As an evidence, OE inherited velars that were mostly sensitive to phonological context as those of Present-Day English. In drawing a comparison between palatalization and the condition of the process known as the velar softening (i.e the characteristic of paradigmatic alternations between/ k/ ~/ s/ and/ g/ ~ /ʤ/, seem quite similar in borrowed Romance vocabulary of PDE as in: critic-criticize and fragment – fragile (Minkova, 2014:84).The velar stop/k/was palatalized in OE to voiceless palatal stop as/ ʧ/ where it is adjacent to high front vowels like/ i/ or the glide/ j/ .Phonologically, it is marked as a case of assimilation whereby a non-coronal segment becomes coronal. The step that follows palatalization was giving the manner of affrication by forming/ʧ/. There was no exact dating to document the process of affrication for/k/to/ʧ/in orthography. But, the articulation of palatal assimilation must have started under condition of allophonic realization of /k/ as/ ʧ/ in weak phonetic or phonological environments like unstressed syllables and in coda positions. The allophone/ ʧ/is mainly described to be a complex segment which preserved the fronted dorsal place of articulation of /k/(i.e involving the blade of the tongue) and having the feature of coronal for both. Significantly, palatalization and affrication are conducted through environments of adjacent front vowels as in OE: cild (child) and cin (chin) (ibid: 85).

William (1975:329) stipulates that the letter <g> represented at least three sounds in OE. One of the phonemes reflected the allophones of/ g/, the voiced velar stop and/ɣ/the voiced velar spirant:

1./ɣ/occurred only in medial positions inside a word or after a back vowel as in (lagu)/lɣu/(law).
2. Initially before back vowels or consonants, <g> referred to the other allophone/g/as in: gōd (God), (good).
3. The third sound represented by the letter <g> was the voiced palatal spirant which is nearly aspirated/ j/. It often occurred after front vowels: stigrap/stijrap/(stirrup).
4. Moreover, the palatal voiced/ j/ which was represented by <g> after front vowels, had the effect to make diphthongization of the Modern English/eɪ/in some words like: dæg/dæj/> Middle English dai/dæi/>ModE/deɪ/(day) (ibid: 340).

Depending on the phonological environment where the graph <c> comes in and the orthographic reference, it was standing for three other affricates as typical as those of PDE. For instance, the digraph <sc> symbolized the modern equivalent <sh> in words like : scēap (sheep) and scēoton (shoot) to refer to/ ʃ/.The second orthographic representation is <cg> in a word like: ecg (edge) to indicate /ʤ/.And the third , as the graph <c> is the common representation with which one may realize that is a matter of phonotactic imposition, it indicates the sound/ ʧ/ as in OE benc (bench) (C. Baugh and Cable , 2002:49).As far as the various articulations of the graph <c> are concerned, it is not always possible to look at an English word and decide which pronunciation to use. This is because of the effect the vowel that follows <c> which may have changed since prehistoric times. Thus, the words clēan (clean) and cynn (kin) which both have the velar/k/, they were derived from the prehistoric forms (kōljan) and (kunni) **(Barber and e-tal, 2009: 117)**. Following the lead of the above illustrations, Minkova (2004: 92) imposes that in the Proto-Germanic, the voiceless/k/ in initial position split in two allophones: a palatal allophone/k/that occurs before front vowels and palatal and the second the velar allophone/k/before back vowels and non-palatal consonants. This phonemic reconstruction projects the two realizations of/k/in ModE before front and back vowels as in: keen, cat, and cool. Needless to say, that the allophonic realizations of Proto-Germanic/ k/ were initially varied on the basis of the universal phonetic behavior.

2- Palato-Alveolars in Middle English and the Adaptation of/ʒ/:

Throughout borrowing from Old French, words which have the modern French/ʒ/ appeared regularly as to be pronounced/ ʤ/ represented by the letter <j> or g+a vowel like: jargon, juice, jealousy, abridge, rage, cage, courage, plunge. The simplification of OF affricate/ʤ/to/ʒ/was progressed in the thirteenth century in the French Continent. The exposure to French loans with/ʒ/is considered the only source of the sound as an independent phoneme. The other allophone of/ʒ/as typical as it is, could arise in borrowed words whose their combinations contain the alveolar fricative/z/followed by a palatal gliding with/j/as a contextual factor that triggers assimilatory palatalization of/z/to/ʒ/and with the elision or loss of palatal glide as in: division/ dɪvɪʒn/, treasure/ treʒə/ and usual/ ju:ʒəl/. The time-depth of the process for such assimilation had no trace in history to determine or judge, because neither orthography nor rhymes of poetry documented it. However, orthoepistic evidence from the middle of the seventeenth century onwards indicates that palatalization was commonly found in scribes but not stable and probably reasoned to varieties of English and OF. Here are some examples illustrating palatal assimilation with their dates **(Minkova, 2014: 141-142)**:

- /z/+/j/>/ʒ/only/ʒ/:
- Measure (1225)
- Confusion (1290)
- Vision (1290)

- /z/~/ʒ/
- Osier (1175)
- Glazier (1385)
- Chausea (1425)

According to William (1975:351), the new phoneme/ ʒ/ was also acquired from French loans and adopted in English in such borrowed words: like: rouge and genre. In additions, the alveolar consonants/t/,/ d/,/ s/ and/z/ were pulled back to further part of the palate to become palatals in following the spirant/j/. Such an effect produced phonemes like/ʤ/,/ʧ/,/ʃ/ and/ ʒ/ in the middle of many English words. By illustrating evidence for the words: picture, solidier, issue, and vision, in contemporary French they are pronounced respectively as:/ pɪktju:r/,/ soljər/,/ ɪsju:/,/ vɪzjən/ .In Chaucer's Canterbury Tales, Shakespeare works and other poets, they often spelled the word (condition) as (condicioun) to represent one or two syllables as the meter required which is indicated by(-cioun>-tion). In this regard, Schultz (2012:94) denotes that English/ ʒ/ and/ ʤ/ are normally used as native substitutes for French/ ʒ/ in borrowed words, whereas the French palatal/j/was replaced by a vowel as in: pompier/pɒmpiɛɪ/.

The letter <j> was originally a graphic variant for the symbol < I > which is considered the second character in a series of two or more Is as in (iiij) to stand for number 4. The use of the letter < I > for the vowels related to/i/and <j> for the consonant/ʤ/was established around 1630 to 1640, but the treatment of these as separate letters took some time to become identified. For/ʃ/, the dominant spelling around 13th and 14th centuries was <-sch> **(Upward & Davidson, 2011:184)**. In OE,/ɣ/was used to be indicated bt < j, g > as an orthographic representation, but during the transition from OE to Early Modern English <g> started to be used as a phonetic representation for the phoneme/g/and neglecting/ɣ/**(Horbin & Smith, 2002: 61)**. Preferably and what is remarkable about the transition from OE to ME is that the digraph <sc> which symbolized the correspondent cluster/sk/, was declustsrized and assimilated into/ʃ/as in fisc>fish.The sequences of vowels/iu/,/eu/ and/ɛu/were unified in a palatalized back vowel/ju:/since they all contain frontal portions as in : new and Tuesday (Chamonikolasova, 2014: 82).

3. Palatalization in Modern English:

As a primary description for palatalization according to place of articulation, the front of the tongue is raised resembling the gesture for/i/ or [j] in the pronunciation of a consonant **(Guessenhoven & Jacobs, 2011: 31)**. In considering palatalization as an alternation, the sounds for which the palate is not a passive articulator, can only be palatalized. It occurs with sounds that have the passive articulator anterior or posterior to the hard palate region. If the passive articulator is the alveolar ridge or the upper incisors, the palatalization process would be used to describe the articulation where anterior portions of the tongue approach anterior parts of the palate (i. e when the active and passive articulators are slightly posited in posterior locations). In case of velar consonants, palatalization indicates the movement or gesture of the active and passive articulators in the direction of the palate to a rather anterior articulation. Generally, palatalization modifies sounds to create a kind of a typical change which is usually perceived as/j/by which the tongue is felt to further back as in the followings **(Bauman-Waengler, 2009: 215-216)**:

- Sushi/sʲu ʃɨ/
- Zipper/zʲ ɪpə/
- Evaluate/ɪvælʲueɪt/

Palatalization is also known as a secondary articulation which gives the palatalized consonant features of either lip-spreading or lip-rounding depending on the vowel that follows as in (Lee,2017 :256-257):

- Key, keep, give:/kʲ i:/,/kʲ i: p/,/gʲ ɪv/
- Music, few, cue:/mʲju:zɪk/,/fʲju:/,/kʲju:/

What is worth mentioning here is that vowel features do not have any contrastive function in consonants but they operate on the allophonic variation generated by the phonetic environment where that allophone results (ibid).

Krämer & Vrek (2016:5) describe palatalization as a natural process which is triggered and motivated by the interplay of acoustic, articulatory and perceptual factors. It is also claimed that palatal articulation is primarily motivated by the acoustic resemblance between its targets and the outputs in the context of front vocoids. For instance, the strings/ki/and/ti/could have the same formant transitions. Although palatalization could be perceptually determined by listeners I decoding acoustic features, some studies still emphasize the articulatory factors. It can be also characterized as a commonly typical example of phonetically natural assimilatory process and sub segmental representation (ibid:6).

4. Velar Palatalization:

Velar palatalization indicates the modification from a velar stop consonant voiceless/ k/ as in (keep) or voiced/ g/ like in (gear)to the corresponding palate-alveolar affricates voiceless/ ʧ/ as in (cheap) or to voiced/ʤ/as in (jeer) **(Wilson, 2006: 947)**. It is nearly common among languages that the velar stops consonants/k/and/g/are articulated further forward on the palate when they come in phonetic contexts before front vowels such as/i:/and/e/than they appear immediately before back vowels like/ɒ/or/ ʊ/. Fronting is considered as the most relevant feature required for palatalization because it makes the articulation of velar stops more similar to that of palato-alveolars affricates (ibid: 948).

Furthermore, velar softening is another phase of velar palatalization in English. It is a phonological articulatory process which affects the velar plosives [k, g]. The voiceless velar plosive/k/and the voiced one/g/are modified or altered to the voiceless alveolar fricative/s/and the voiced in intervocalic environments of vowels as in the following examples (Radomski, 2010: 66):

- [k] ~ [s] [g] ~[ʤ]
- Electric [k] ~ elecctri[s] ity prodi[g]al~ prodi[ʤ]y

In other terms, the alternation of coronal sounds in the context of the front gliding (for a vowel or a palatal/j/) could be attributed to the process of two rules; spirantization changes [+ anterior] stops into fricatives and

palatalization modifies [+ anterior] fricatives and stops to fricatives and stops **(Cavar, 1997: 30)**.

5. Assimilatory Palato-Alveolars:

Assimilatory palate-alveolars can be identified as those phonemes represented by/ʃˊ,/ʤˊ,/ʒ/and/ʧ/whether they are the outputs of historical changes or they occur at words boundaries governed by environments. So far, by classifying affricates or palato-alveolars in term of assimilation, the followings are to be regarded:

1. Palato-alveolar assimilation: occurs when the palate-alveolar characteristics of the assimilator sound are shifted to the assimilee (i. e being identical in terms of articulatory features). This process may be realized as palate-alveolarization as in: horse shoe [sʃ] > [ʃ ʃ] , question [stʃ] > [ʃ ʧ], is she [z ʃ] > [ʒʃ].

2. Palaral Assimilation: it takes place when the palatal features of the assimilator phoneme modify the assimilated one (categorically or non-categorically). This articulation is usually known as palatalization symbolized by [j]. It occurs when a consonant is followed by high, tense and front vowel or [j] as in: Peter [pʲi:tə], like you [laɪkʲ ju:].

3. Velar assimilation occurs when the velar features affect the assimilated phoneme to be transferred to another in a contextual combination as in: on course [ŋk] and that car [tkk] **(Pavlik, 2009 :15)**.

Minkova (2014: 145) points out the regressive palatal assimilation which usually occurs PDE words boundaries:

- [-s] +[j-] > [ʃ]: this year
- [-z] + [j-] > [ʒ]: as you say
- [-t] + [j-]> [ʧ]: got you
- [-d] + [j-] >[ʤ]: bad you

The assimilation of the alveolar obstruents to a following palatal in word boundaries is more gradient and habitual than within words. However, the presence of [j] in initial position of the next word is not a sufficient condition unless the two words provide unified prosodic domain and a clectic group with a single stress but words should also preserve their independent stress pattern.

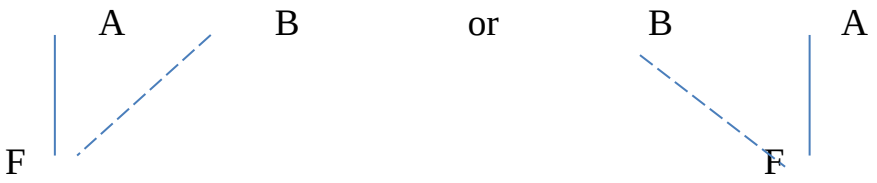
6. Articulator-Based Feature Model:

The central development made to feature theory is the idea that speech is produced by using severally independent functioning articulators. These articulators form a compression of the lips, the tongue body, the tongue root, the soft palate and the larynx which may identify a single primary constriction in the vocal tract or they can be operated and synchronized together to produce several constrictions at the same time in what is called a complex node. Since the articulators have the main role in the organization of the segment structure, it is suggested that they should be represented by nodes of their own phonological representations. Among those nodes,

labial, coronal and dorsal which are defined in terms of oral tract articulations as in **(Clements & Hume, 2007: 5)**:

- **Labial**: Involving the lips as an active articulator.
- **Coronal**: Involving the tongue as an active articulator.
- **Dorsal**: Involving the tongue body as an active articulator.

This model is more applicable to be utilized to describe assimilation. The widely current description is that one manipulated by standard of generative phonology which introduces assimilation in terms of feature copying (i. e the segment or the phoneme copies the feature of the neighboring one).According to the current model, articulator-based feature model, assimilation rules are characterized as an association (or spreading) of a feature or forming a node feature (F) of a segment (A) to neighboring segment (B) as shown below (the dashed lines refer to the association lines added by the rule):



There are two kinds of assimilation postulated by this model. If the rule spread only feature (i.e the assimilated segment takes a new feature), it applies in a feature-filling mode. When the rule applies to segments that are already specified for the spreading features replacing values, the rule is a feature-changing mode. It is also proposed that there are distinguishable other kinds of assimilation according to the identity of the spreading node. If the root node spreads, the affected segment or the phoneme will acquire all features forming a total assimilation. Whereas, if an affected segment acquires several but not all features, it is identified as a partial assimilation which parallels palatalization in this instance (ibid: 10-11).

Throughout the assimilation or the palatalization articulations, the node refers to the constriction that defines the assimilated or palatalized segment and dominates on other features as a partial alternation (Cavar, 1997: 8). Concerning palatalization, Clements and Hume claim that minor coronal articulation might be optionally reassigned as a major articulatory status by a process known as promotion by which the secondary articulation is delinked according to the constriction formed to be main articulation. It replaces the original dorsal articulation **(Watson, 2002: 33)**.

7. Arabic Palato-Alveolars:

Generally, Arabic has several kinds of palatals that are distributed among the features of: palatals, velar stops, palato-alveolars or affricates. The phoneme which is called (jeem) (ج), [ʤ] is realized either as voiced palatal stop or as a voiced palatalized velar stop. In early Classical Arabic and varieties of Arabic today, it is identified as a voiced palate-alveolar affricate or a velar stop.In Cairene and Yemeni spoken dialects in Taʕizz and Huggaryyah [ʤ] is articulated as [g] considering it one of the allophones of [ʤ].In some countries and cities like Upper Egypt, parts of Sudan, Syrian

desert, Khuzistan Hadramawt, Dhofar and the Gulf dialects, it is realized as a palatal glide [j] **(Watson, 2002: 15-16)**. As for the voiceless stop [k], retains its features in most Arabic varieties except central Palestinian Arabic, it has been changed to a palate-alveolar affricate [ʧ]. The sound is considered as the allophone of [k] in Arabic in the phonetic environments where front vowels are found in words together.

Giving the two phonemes [ʃ] and [ʤ] almost the same features as affricates and palato-alveolars except [ʤ] which has a plosive manner, might have led Arabs to assimilate or alter [ʤ] to [ʃ]in some Old Standard Arabic dialects. Either they are assimilatory according to their features or Arabs appealed to substitute one phoneme by another which is adjacent to the place of articulation for the former as in **(Khalil & Arayfi, 2015: 1043)**:

- ʔʤdaq ⟶ ʔʃdaq اشدق - اجدق

- ʔʤdar ⟶ ʔʃdar أشدر - أجدر

- mudmaʤ ⟶ mudmaʃ مدمش - مدمج

In respect to Ibin Jinis illustration, it is indicated that some Arab tribes like Tameem (تميم), Bani Saʕad (بنى سعد) and Qudhaʕa (قضاعه) often substituted [ʤ] with the palatal gliding [j]. Hence, it gives the explanation why Arab speakers in Gulf countries and some parts of Arabia articulate:

- raʤul ⟶ rajul n ريل -رجل - man

- waʤid ⟶ wajid واجد - وايد - very much

In this kind of articulation, palatalization is being utilized to achieve attenuation (i.e lightening the articulation of the sound [ʤ]) (ibid:1044).It is also proposed by Arab grammarians and phoneticians like Sibawayh and Ibin Jini that there was some kind of articulation of the phoneme [ʤ] resembles to [ʃ] in some features as their investigation of features hierarchy claims.It is also reported that the two phonemes above are somehow replaceable according to some dialects of Old Standard Arabic **(Ababneh, 2015: 426)**.

Bishr (2000: 303) assumes that the Syrian Levantine [ʒ] is one of the allophones of [ʤ] and can be turned into [ʃ] in vocalic environments or in being mispronounced. It is noticed by Al-Deaibes (2016:25) that there is a wide variety or differences from one Arabic dialect to another, even in one country in the production of palato-alveolars. The phoneme [k], in this regard, is realized as [ʧ] in Rural and Bedouin varieties of Jordan and Iraq.As a further variety, the uvular [q] is being substituted with [g] within those Bedouin regions. As for [ʤ], it is simultaneously substituted or articulated as [ʒ] in most Levantine Arabic varieties as in:

- [k] > [ʧ] – kalib > ʧalib كلب - چلب - dog

- [q] > [g] – qalb > galb قلب - گلب - heart

- [ʤ] > [ʒ]- ʤar > ʒar جا ر- ژار - neighbor

8. Assimilatory Palato-Alveolars in Arabic:

The palatal assimilation that is commonly found in the recitation of the Glorious Qur'an is represented by the germination-like process. It results in changing the final unvocalized or vowelless [n] into [j] as in **(Al-Fozan, 1989: 60)**:

- ʔaman jaqu:lu > ʔamaj jaqu:lu (أمن يقول)

The other kind of palate-alveolar assimilation can be represented by a special articulatory process known as (ʔIxfa: ʔ), (similitude) which means hiding the utterance or concealing it as a literal meaning for the term. In fact, this process is classified under the partial kind of assimilation with which the assimilee acquire some features from the assimilator. Supposedly, the node of features is likely to have [palatal], [nasal], [velar], [affricate] or [fricative] as in the following example which shows a nasal dorsal node:

- ʔin ka:na > ʔiŋka:na إن كان - if it was

The output of the velarized [n] is [nŋ]. It is significant to say that [k] or any other velar that comes after vowelless [n] within a word or at its boundary will slightly acquire voicing (ibid).

The adjacency of palate-alveolar articulation to some sounds like [n] and [d] have the influence to make the identical as velars or affricates as in the following Qur'anic expressions (Rahim & Younis, 2013:10):

- faqad ʤa:ʔa > faqaʤ ʤa:ʔa ﴿ فَقَدْ جَآءَ أَشْرَاطُهَا ﴾ **(سورة محمد: الآية: ١٨)**

(But already Have come some tokens) (Mohammed / 18)

- qad ʃaɣafaha: > qaʃ ʃaɣafaha: ﴿ قَدْ شَغَفَهَا حُبًّا ﴾ **(سورة يوسف: الآية: ٣٠)**

(Truly hath he inspired her with violent love) (Yusuf / 30)

9. Palatalization in Arabic:

In the description of [k] and [ʤ] features in Arabic, [ʤ] is being formed of two articulations [d] and voiced [ʃ] in a process which is called double or co-articulation. While [k] is the palate-alveolar that is articulated in one stricture which resembles [ʤ] in all features but with slightly further position back in the palate and being voiced. Giving [ʤ] co-articulative feature of production, presumably it will lead to say that there is no possibility for assimilation of the two phonemes, [k] and [ʤ] in any case. On the other hand, the palato-alveolarization of [k] to [ʃ] can be found in Old Standard Arabic according to narrations concerned with the irregular recitations of the Glorious Qur'an. Concerning this matter, reciters substituted [k] with [ʃ] coloring it with features of [ʤ] as in:

- taḥtaki sariyya: > taḥtaʃ ﴿ تَحْتَكِ سَرِيًّا ﴾ **(سورة مريم: الآية: ٢٤)**

(Hath provided a rivulet Beneath thee) (Maryam / 24).

- iṣṭafa:ki wa ṭaharaki ﴿ ٱصْطَفَىٰكِ وَطَهَّرَكِ ﴾ **(سورة آل عمران: الآية: ٤٢)**

- iṣṭafa:ʃ wa ṭaharaʃ

(Allah hath chosen thee and purified thee) (Al-Imran / 42).

It is hard to decide whether it was [ʒ] or not but such a process of articulation may evolve controversial perspectives about scholars questioning

their integrity in this field, rather than considering it as a contextual grading **(Ababneh, 2015: 28)**.

Hypothetically, the possible explanation for the asserted regulation that there was [ʃ] which resembles [ʤ] or an allophone of it, might be the Levantine articulation of [ʤ] to [ʒ]. The phoneme [ʒ] is considerably an allophone for [ʤ] relating it to the classifications of phonological or dialectal realizations. In defining the relation between [ʤ] and [ʒ], it is obvious that they are articulated with the same organs and they only differ in voicing **(Bshr, 2000: 316)**. Moreover, as an example of stop affrication, some females in Egypt articulate [d] with a slight friction as in:

- la di: wa la di: > la ʤi: wa la ʤi: لا دى ولا دى - neither this nor that.

This makes it clear that [d] is affected by the fronting of the following vowel (i.e the coronalization) to be modified or altered to [ʤ].In other context, it may also refer to other kind of a palate-alveolar affected by the front vowel [i:] as in:

- ḥabibti: > ḥabibʧi: حبيبتى - darling

One might assume that [t] is also being coronalized by the front vowel producing [ʧ] in similar process of English pronunciation (ibid: 328).

Throughout the discussion of words that display consonantal harmony in, Zellou (2013:2) remarks that palate-aveolars of Moroccan Arabic like [ʒ] and [ʃ] show quite interplay with other phonemes when [ʒ] replaces [ʤ], the following words:

- zuʒ زوج - two
- sʒin سجن - prison
- sarʒab سرجب - window
- sfarʒal سفرجل - quince

manifest left-hand feature assimilation which goes along with consonantal harmony or the overlap of features of [s] and [z] with velars like [ʃ] and [ʒ]. Because the place of articulation for both sibilant coronals [s] and [z] and the palato-alveolars [ʃ] and [ʒ] is closely identical, the phonemes [s] and [z] are assimilated or substituted by [ʃ] and [ʒ] :

- ʒuʒ
- ʃʒin
- ʃarʒab
- ʃfarʒal

As commonly known, palatalization of the coronal and to the less sonority degree consonant dorsal occurs in Cairene and San'ani Arabic. The Cairene coronal palatalization has two different realizations: the first is the weak palatalization whereby the palatal feature shows a completely different characteristic while it keeps the basic one which is apical (i.e tongue front

or tip) as in the case of strictures of [tj] and [dj].And the second one is the strong palatalization that involves a switch or a modification in the place of articulation of the assimilee from apical to a post-alveolar as in the case of [ʧ] and [ʤ].Most likely this kind of articulation is triggered by high tense front vowels and [j] as in:

- Nadja: > Na[ʤ]ja: ناديه
- ʔinti: > in[ʧ]i: إنت
- sanati:n > sana[ʧ]i:n سنتين

Whereas San'ani palatalization is considered as the weaker one. Because the coronal palatalization occurs just when triggered by a following palatal glide [j]. And dorsal stops palatalization is commonly stimulated by the following palatal glide and motivate in tautosyllabic long palatal vowel like [i:] **(Watson, 2002: 258)**:

- ʔadja:n > ʔad[ʤ]ja:n أديان - religions
- ʔakja:s > aʔ [kʲ]ja:s أكياس -bags
- ki:lo > [kʲ]i:lo كيلو -kilo

Consequently, the consonant inventory of Baghdadi Arabic dialect contains a voiceless palate-alveolar affricate represented as [ʧ]. It is proposed that the origin of this phoneme process of palatalization was conducted either through coronalization or affrication. This kind of palatalization is also being motivated by the rule custom of front vocoids (usually front vowels) which influenced an adjacent [k]or [ʤ]. As a supporting report for the phonetic phenomena, old Arab scholars and grammarians like Sibawayh and Al-Zmakhshari considered affrication as a spoken feature for some tribes in mid and eastern Arabian Peninsula. It invented the transfer the articulation of [k] into [ʧ] in environments of palatals and vowels. The traditional term for this type of articulation is known in Arabic as (Al-Kashkasha). The change of [k] to [ʧ], later stimulated another shift represented by [g] to [ʤ]. On the Baghdadi Arabic, there are some examples that show contrast, alternations, variations and paradigms related to plato-alveolars **(Yousef, 2013: 248)**:

- ʧaraz چرز (mixed seeds) karaz كرز (cherries)
- ʧala:wi چلاوى (kidneys) kala:wi
- ʧu:b چوب (tube) ku:b (cup)
- ʧa:n چان (was) ka:n)
- ʧibi:r چبير (big) - ʔakbar bigger اكبر
- ʧilmah چلمه (word) - Kilmah
- ʧalib چلب (dog) - kalib

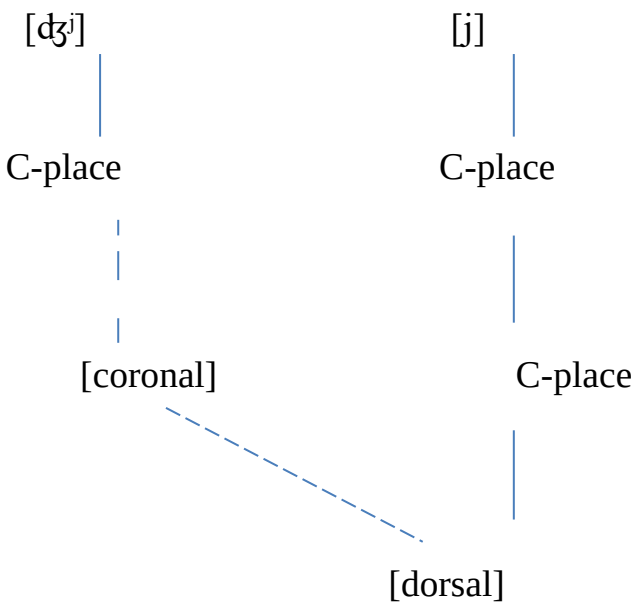
Such a variety of course submit to the grammatical and morphological constraints governed by the contextual use.In addition, [ʧ] is usually followed by front high tense vowel like [i:] as it is posited post-vocalically **(ibid: 249-250)**.

10. Methodology:

The Articulator-Based Feature Model implemented by Clements and Hume (2007) is sufficiently applicable to the data provided from Iraqi Arabic and the articulation of similitude (ʔxfa:ʔ) in the Glorious Qur'an, for only palate-alveolars that are followed by vowelless [n].In one case, when [n] is followed by [j] or [i:] it gives a total feature assimilation which allows the constriction to form a typical [j] instead of the nasal as it is hypothesized in advance. Since the distribution of features under the node forming the constriction is nearly universal, supposedly it is appropriate to suppose that the tongue during the similitude process is an active articulator through coronal or dorsal initiation. The analysis of Quranic expressions consists of words which contain [n] followed by [ʤ], [ʃ], [k] and [j] which practically seem to provide environmental stricture of for nodes of either coronal or dorsal features spreading. On the other hand, the words which are taken from Iraqi casual or colloquial speech contain environments where [ʤ], [ʃ], [g] and [k] come in phonetic environments followed by front vowel [i:] as contextual input.

11. Analysis and Discussion:

1. / ʔɪʤʲi:jat/ إجيت - I came



The right-hand spreading feature of dorsal can generate a coronal characteristic for [ʤ] which interacts with its place of articulation. The sound [ʤ] is an independent phoneme in Arabic which did not undergo historical assimilation or affrication like [ʧ], however, it is still claimed that [ʤ] is a mixture of co-articulation can be represented in the following diagram, which also illustrates the [ʤ] node followed by the [i:] as a final output for the above palatalization containing promotion process:

- /ʤʲ / /i:/



C-manner C-place

.

[closed] V-place

[coronal]

When the node c-manner is [closed], [ʤ] is only receiving coronalization feature from front [i:] considering it as originally coronalized in final output of an articulation. This case is diagnosed as promotion.

2- / ʧi:s / چیس - bag

/ʧʲ / / i: /



C- manner C- place

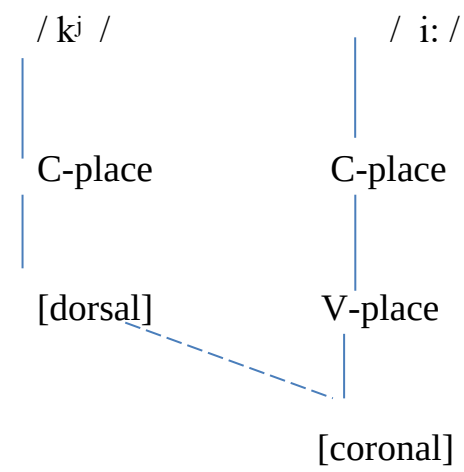
([-dorsal]) V-place

[closed] [coronal]

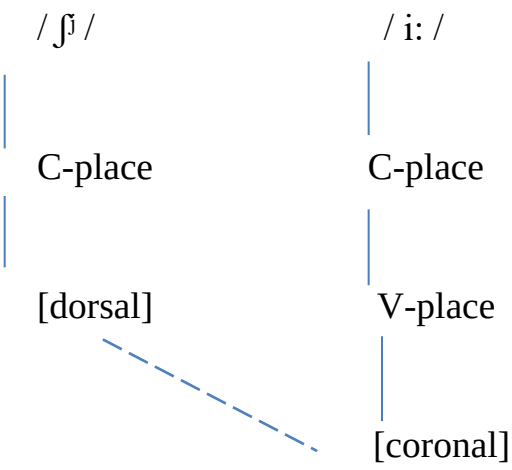
The crucial concept to be mentioned here, is that the first node of the vowel [i:] represented by C-place is assumed that it acts like consonant in its effect but not to the degree which make it a dorsal palatalization but it is still as an optional behavior resembling [j] although [ʧ] receives that feature. This case is also promotion process where [ʧ] either being dorsal in some cases of confirmative articulation to some degree which show overt [j] or being a normal coronal. While in case of the same word being pronounced with [k] as an alternative dialectal variation, the node of

features formulates dorsal output as a weak palatalization as in the following diagram:

-/ kʲi:s / كيس

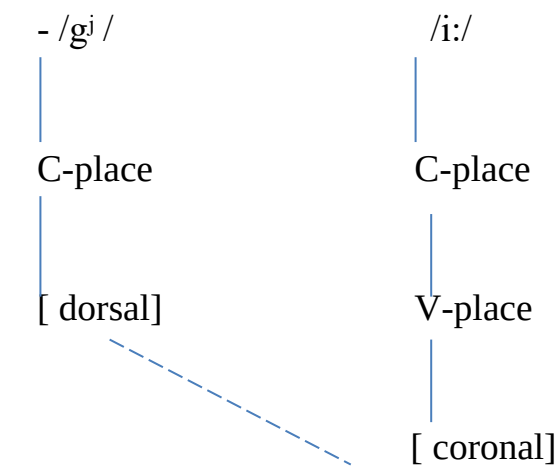


3-/ ʃʲi:ri:n / شيرين - a proper noun



In accordance with what is illustrated above, the coronal front vowel is slightly confusing to judge because it is somehow noticed that dorsal and coronals overlap in the environments of fronting. The coronalization node, in general, results in a dorsal output in most of times for palato-alveolars. As a fact to mention and almost in all of the Iraqi Arabic dialects, speakers articulate the [ʃ] with slightly constrictive obvious [j] as if it was a phonetic realization within the combination of the word.

- /gʲi:zar/ گيزر - furnace or heater



Although the place of articulation for [g] is felt further back than it is in [ɟ], the node formulated above renders a constriction which allows the coronal effect of [i:] and its feature spreading to it a rather dorsal feature as being considered a weak palatalization. In other terms, the stricture formed by the double articulation of the weak palatalization represented by [gʲ] includes the phoneme [j] voicing feature as it is heard rather than [g].

11. Analysis of Similitude in the Glorious Qur'an (ʔixfa:ʔ):

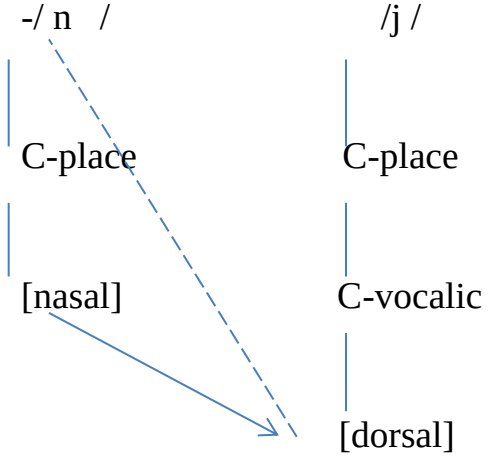
The common strictures formed through the recitations of Glorious Qur'an are articulated with partial assimilation or similitude (ʔikhfa:ʔ), إخفاء)).The rule of similitude postulates that vowelless or unvocalized [n] should be velarized or alveolo-palatalized when it is followed by [k], [ʃ] and [ʤ],while it is completely assimilated if it is followed by [j].The most predictable outputs for similitude according to the Articulator-Based Feature Model in the Quranic expressions analyzed in this study would be hypothetically neutral dorsals or pure dorsals.

١. ﴿ إِن يَشَأْ يُذْهِبْكُمْ وَيَأْتِ بِخَلْقٍ جَدِيدٍ ﴾ **(سورة إبراهيم: الآية: ١٩).**

(He can remove you and put (in your place), A new creation) (Ibraheem /19).

- ʔij jaʃaʔ إِن يَشَأْ

In respect to this case of total palatal assimilation, the stricture formed in the node represents the change from nasal to palatal and the feature spread is fortified by a geminated [j] which turned the whole place of articulation for [n] into dorsal palatal articulation. The possible analysis for this node can be illustrated by the following diagram:

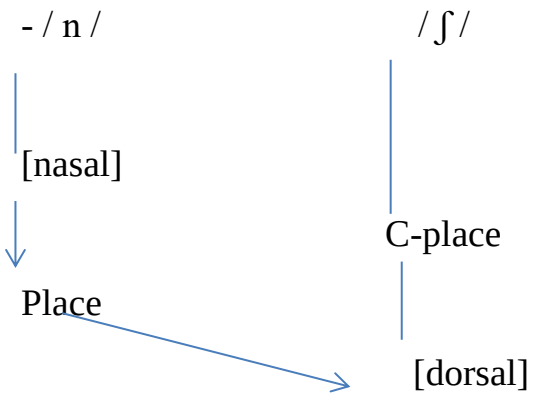


Since [n] undergoes a total assimilation which is in a [nasal] place of articulation, it is modified into two ways according to the stricture given, the first is the features transfer or spreading represented by the dashed lines as it is considered as an initiation then the second level where it is the change in the place of articulation to become as typical as [j]. The phoneme [j] vocalic behavior is the essence of such an articulation.

٢. ﴿ لِمَن شَآءَ مِنكُمْ ﴾ **(سورة التكوير: الآية: ٢٨).**

[(With profits) to whoever Among you wills] (Al-Takweer / 28).

- / liman ʃa:ʔa / لِمَنْ شَاء –

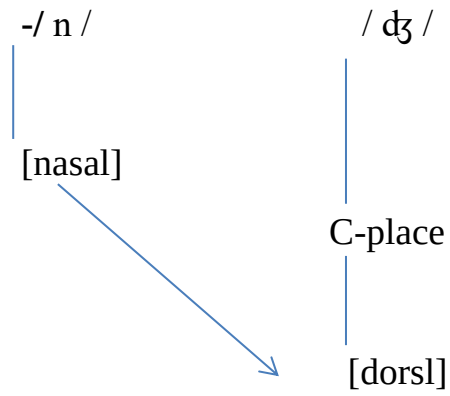


The case of similitude or partial assimilation above, accounts for two modifications formed by the node. The first represented by partial transfer of features from [ʃ] to [n] which neutrally changes the place of articulation to dorsal and the second is to generate a velarized or palato-alveolarized [n] as [nʃ].Represented by a solid line the diagram, means that at the second stage the place of articulation for [n] is more modified or neutralized to be heard as [ʃ].The classical explanation for such a node according to the recitations of the Glorious Qur'an is due to the adjacency in the place of articulation for both phonemes. Thus, perspective seems right enough to motivate either features spread or total assimilation.

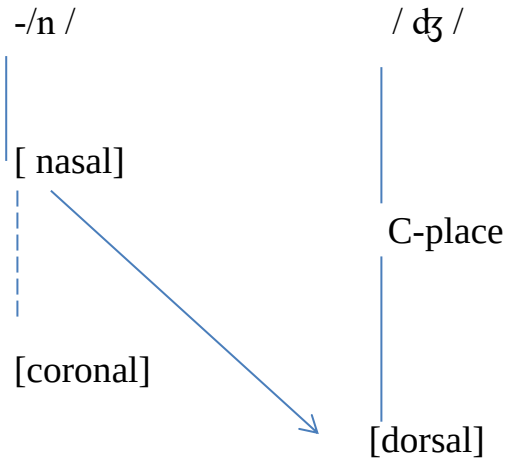
٣. ﴿ لَهُم مِّن جَهَنَّمَ مِهَادٌ ﴾ **(سورة الأعراف: الآية: ٤١).**

[There is Hell, as couch (Below) and folds of covering above] (Al-A'Raaf /41).

-/ min ʤahanama / مِّن جَهَنَّم



In this case, the spread of features from [ʤ] to [n] formed in the node above renders a stricture that blocks nasal place of articulation for [n].According to the Tajweed rules and recitations of the Glorious Qur'an, it happens that in conditions of similitude, concealing or attenuating [ʃ] and [ʤ] articulations, the process is usually conducted with slight neutralization of [n] with a short duration before resembles an initiation for trigger to palace of articulation of [ʤ] before it is shifted to the optimal palate-alveolar place. This neutral duration might be listed or involved in producing mild coronalization which is similar to mid front vowels in English [ɛ], [ɜ:] and even [e]. Under such a condition, there might possibly be a coronal optional output added to [n] as in the diagram below:

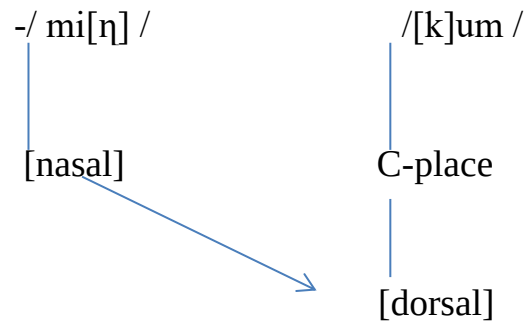


٤. ﴿ مِنكُم مَّن يُرِيدُ ﴾ **(سورة آل عمران: الآية: ١٥٢).**

[Among you are some that hanker after] (Al-'Imran / 152).

- /minkum / > /miŋkum /

It is familiar to see that the interaction of [n] with [k] will produce the post-alveolar [ŋ] in an assimilation process that almost signals all features spread and also the forming node blocks and changes the place of articulation for [n]. This is also triggered by the adjacency in place of articulation for [n] and [k] or to some consideration share some features. The possible node for such an articulation of assimilation can be as follows as:



Since [ŋ] is considered quite post-alveolar nasal, the node indicates dorsal feature shift. What is important to notice in such a node is that neutral coronalization has not been signaled because [k] is articulated in further back of the palate rather than [ʃ] and [ʤ].

12. Conclusions:

In Old English the letter <g> represented a variety of velars and palato-alveolars depending on the phonetic environment in which it occurs. It refers to [g] or [j] while <c> after front vowels indicates [ʧ] and in other environments signaled [k].Later, [ʒ] was the result of [ʤ] simplification process of articulation, but it is not the case, most of borrowed words or forms like: juice, jealous, abridge, were articulated with [ʤ] for the symbol <j>.In short, some words are adopted with an independent [ʒ].[z] is considered one of the allophones of [ʒ] which was changed as typical as [ʒ] in some environments which consist of fricative-vocalic stimulation elements. Some words were undergone historical assimilation to produce [ʃ], [ʧ], [ʤ]

and [ʒ] where other consonants like [s], [z], [d] and [t] fall I a coronal or dorsal environments (i.e followed by high tense front high vowels or the palatal [j]).

On the other hand, Arabic manifests a variety of palato-alveolars distributed on different Arab countries dialects. For instance, coalescent assimilation occurs in some accents of Egyptian Arabic to produce [ʤ] and [ʧ],added to that, speakers of Cairene Arabic substitute [ʤ] with [g].In Jordanian Arabic and most of the Levantine varieties, speakers of Arabic articulated [ʤ] as [ʒ].In Iraqi Arabic and specially the Baghdadi dialect, speakers use or articulate most of the palato-alveolars except [ʒ].Originally, old Arab scholars and grammarians proposed that [g] is the output of irregular articulation or the mispronunciation of [ʤ] and the substitution of [ʤ] with [j] was introduced as an attenuation or ease of pronunciation. In other words, [g] is taken as a contiguity for [ʤ]. Throughout the implementation of the Articulator–Based feature model, the nodes that form the constrictions in Iraqi words for palato-alveolars that are assigned as palatals (dorsals) and coronals, represent right-hand spreading feature. The coronalization triggered by [i:] motivates dorsal feature and the dorsal feature node is stimulated by [j] which is a coronal feature that characterizes [ʤ]. Concerning the case of [ʧ] node feature, the C-manner is closed, because it is already shifted or promoted by the effect of coronal place of articulation of [i:].As far as similitude or (ʔixfaaʔ) in the Glorious Qur'an is concerned, the node stricture triggers two phases, the first is the spread of features where [n] is followed by [ʤ] and [ʃ] signaling mild neutral coronalization which is an optional extra feature for the node and the second represented by the production of [ŋ] which indicates a complete shift for the place of articulation as new phoneme keeping the slight nasalization as a post-alveolar or rather being an allophone of [k] in Arabic.

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