An Optimality Theoretic Analysis of Monophtongization in Libyan Arabic

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Abstract

The aim of this paper is to shed light on the phenomenon of monophthongization, whereby a diphthong is changed into a long monophthong. As established by Yoda (2005), Gaber (2012), Elramli (2013), and Hwaidi (2016) in Libyan Arabic, especially in the varieties spoken in the western part of Libya, the diphthongs /aw/ and /aj/ surface as [oo] and [ee] respectively. The former monophthong is a combination of /a/ and /j/ while the latter is an amalgam of /a/ and /w/. The constraint COMBINE {A, I} guarantees that /aj/ is realized as /ee/. By the same token, COMBINE {A, U} guarantees that /aw/ surfaces as /oo/. Given the fact that COMBINE {A, I} and COMBINE {A, U} have analogous tasks, and taking linguistic parsimony into consideration, we can unify these two constraints, ending up with the constraint COMBINE {FEATURE}. The same is true of the constraints MAX-{A} and MAX-{U}, which can be merged to yield MAX-FEATURE.

It will be shown that the constraint responsible for the alternation is the markedness constraint NO-DIPH. This constraint, however, is at work only when the diphthong is in a non-final position. By contrast, when the diphthong is word-final no monophthongization takes place.

The analyses in this paper will be cast within the framework of Optimality Theory (Prince and Smolensky 1993/2004). The relevant OT constraints will be introduced and the ranking of these conflicting constraints will be accounted for.

Keywords: monophthongization, Libyan Arabic, Optimality Theory

1. Introduction

This paper presents a novel Optimality Theoretic analysis of monophthongization in Libyan Arabic (LA). It aims at providing a clear picture of this widespread phenomenon. A diphthong can be defined as "a vowel that changes its quality within the same single syllable" (Chalker and Weiner 1994: 116). A diphthong has also been defined as a "two-mora sequence, comprised of non-identical components which belong to the same syllable." (Feldstein 2003: 253) Diphthongs are structurally similar to long monophthongs in that both are prosodically equivalent. Long monophthongs are distinguished from diphthongs in that whereas the former consist of two identical moras, the two moras comprising the latter are different (ibid).[1]

The paper is organized as follows. Following this introductory section, section (2) sheds light on related work. Section (3), which is the core section, presents the data and the constraints

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[1] The moraic clusters that Feldstein (2003) discusses are composed of a vowel and a moraic sonorant, which can be a nasal, liquid or a glide. This is not so in the dialect we are dealing with, as the diphthongs here consist of a sequence of a vowel and a glide.

responsible for this phonological process. Section (4) unifies the constraints presented in section (3). Section (5) deals with potential candidates of the form CV, with the glide missing from the output.

2. Literature Review

Monophthongization is not restricted to LA but can also be witnessed in other modern dialects of Arabic such as Egyptian, Lebanese, Moroccan, Saudi, Syrian, and Tunisian[2]. Heath (1987: 235) mentions instances of this phenomenon in one variety of Moroccan Colloquial Arabic (MCA). For Heath, similar to what is adopted in this study, a diphthong is a sequence of a short vowel and a semivowel. But whereas LA diphthongs surface as [oo] and [ee], Moroccan diphthongs monophthongize to [u] and [i], e.g. /ʃarəy/ [ʃari] (Heath 1987: 95). Heath also argues that a few diphthongs exist in MCA, the most persistent of which is /ʕəwd/ 'horse', which forms a minimal pair with /ʕud/ 'stick (of wood)' (1987: 235). In LA, the former form is pronounced as [ʕood][3].

It is relevant to say that monophthongization occurs in eastern Libyan Arabic, but non-monophthongized forms (i.e forms where the diphthongs are intact) are used more frequently (Abdunnabi 2000: 20-21). Thus, a form like *bajt* 'house' or *nawm* 'sleep' are most likely to retain their diphthongs. Owens (1984: 10)[4] says that "all occurrences of e: and o:[5] are from Classical Arabic ay/aw." It should, however, be noted that although the dialects described by Owens (1984) and Abdunnabi (2000) are classified as belonging to Eastern Libyan Arabic, they are somewhat different. Owens studied the dialect used in Benghazi and neighbouring areas, while Abdunnabi dealt with the variety spoken in Al-Jabal Al-Akhdar (the Green Mountain). This latter dialect was also studied by Mitchell (1960). Forms with diphthongs are more noticeable in the latter dialect. Owens compares Mitchell's *laysh* 'why'and *Tawr* 'bull'with his (Owens') *le:sh*and *To:r* (p. 10). Owens further argues that the dialect he studied preserves the diphthongs only after [ħ, h and ʕ] as in *ħawsh* 'house', whereas the dialect studied by Mitchell almost always keeps the diphthongs unchanged.

3. Monophthongization

Speakers of LA frequently avoid the diphthongs /aj/ and /aw/, replacing them with the monophthongs /ee/ and /oo/, respectively. Consider, for example, the alternations in (1).

(1) a. i. sajf ~ seef 'sword'
ii. kajf ~ keef 'how'
iii sajl ~ seel 'flood'
iv. zait ~ zeet 'oil'
b. i xawf ~ xoof 'fear'
ii. ħawl ~ ħool 'year'
iii. lawm ~ loom 'blame'

[2] The realisation may be different in different Arabic dialects. For example, LA *keef* is Lebanese *kiif* (Ghada Khattab, p.c.) This word is realised as *kifaaʃ* in Tunisian Arabic (Mohamed Jlassi, p.c.)

[3] In LA, a horse is referred to as *ħsaan*; *ʕood* is used, especially ironically, to refer to an 'old' horse.

[4] See also Abu-Mansour (1992: 49) who says that in most Arabic varieties the long mid vowels *ee*and *oo* have been developed from the diphthongs *aj* and *aw*, respectively.

[5] e: and o: are equivalent to our ee and oo, respectively. ay is equivalent to our aj.

iv. jawm ~ joom 'day'

The constraint NO-DIPH (Rosenthall 1994; Rosenthall 2006: 412; Gnanadesikan 1997; McCarthy 2008: 171) is responsible for the alternations in (1). This constraint is, of course, confronted by a faithfulness constraint militating for no difference between input and output forms. Tableau (2) shows the interaction between these conflicting constraints.

(2)

Input: /kajf/	NO-DIPH	**IDENT**-IO
a. ▪ keef		*
b. kajf	*!	

Candidate (2b) is fully faithful to the input form at the expense of violating NO-DIPH, which causes it to be eliminated and chooses unfaithful (2a).

These examples indicate that monophthongization takes place only when the word ends in a consonant. The following examples, however, need special attention.

(3) a. i. ʒaw 'weather'
ii. law 'if'
iii. taw 'now'
iv. naw 'hot weather'
b. i. ħaj 'alive'
ii. baj 'honorary title'
iii. zaj 'as'
iv. naj 'raw/undercooked'
v. ʃaj 'thing'

It is clear that the diphthongs in (3) are intact. But why are they so? Relevant to this discussion is a constraint proposed by McCarthy (1993). This constraint, known as FINAL-C, "requires that words end in a consonant (such as *r*) or a glide." (173) McCarthy argues that intrusive *r* is resorted to -in Bostonian English- in order to prohibit vowel-final words not, as is widely believed, to avoid hiatus. Of course, what is of interest to our discussion is not the requirement that words end in an *r*, but in a glide. This constraint has also been cited in some other works such as McCarthy and Prince, (1990), Gafos (1995), Ussishkin (2007).The examples in (3) end in a glide, thus satisfying FINAL-C.

(4)

Input: /ħaj/	FINAL-C	NO-DIPH
a. • ħaj		*
b. ħee	*!	

This tableau shows that having a glide[6] at the end of a stem is better than having a vowel. Consequently, candidate (4a), with the sequence *aj* unchanged, is chosen as the actual output while (4b), with the monophthong *ee*, is excluded.

The fact that words in LA can end in a glide with no monophthongization taking place is confirmed by the following examples, where the glide is preceded by a long /aa/.

(5) a. i. bikkaaj ‘crying’
ii. ʔilɣinnaaj ‘family name’
iii. duwaaj ‘talkative’
iv. girraaj ‘studious’
v. raaj ‘opinion’
b. i. ʃittaaw ‘folk songs’
ii. gnaaw ‘family name’
iii. gillaaw ‘family name’
v. blaaw ‘pilau (rice)’

Rosenthall (2006: 408) argues that high vowels and glides are closely related in that both are vocoids and thus have V-place nodes. They, however, differ insofar as vowels are [-consonantal] while glides are [+consonantal] (see also Clements and Hume 1995).

(6) a. /i/ /y/
[-cons] [+cons]
. . . .
. | |
V-place V-place
. . . . | |
I **I**

Rosenthall (2006) introduced the constraint {I/U} =μ “which ensures that vocalic elements {I} and {U} are parsed moraically” (p. 409). Taking this constraint and the argument stated in the few lines before it into consideration, note that /I/ is closely related to /j/[7], while /U/ is strongly connected to /w/. The monophthongized forms in (1) satisfy this constraint because, as has already been explained, a long monophthong is bimoraic.

It has been argued that the dialect prohibits diphthongs. NO-DIPH could be satisfied in a number of ways. For example, the form **kaaf* with a long [aa] definitely avoids incurring a violation of this constraint. Likewise, the form **kiif* is safe from NO-DIPH. In addition to respecting NO-DIPH, the glide /j/ in these forms is parsed moraically. In respect of these two constraints, they are equal to the actual output form *keef*. These forms, nonetheless, fail to be optimised as they do not respect another important constraint.

[6] Rosenthall (2006: 409) believes that glides are consonantal; they can be in onset position.
[7] Of course, /y/ and /j/ are variant transcriptions of the same glide segment.

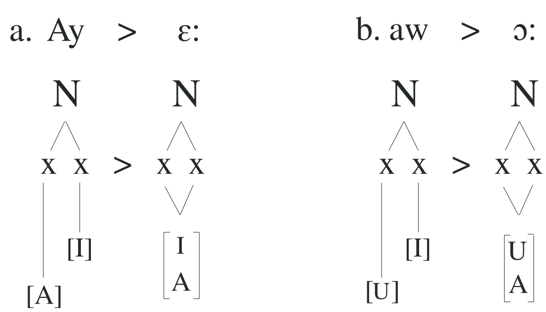
Before dealing with this constraint, a word is in order about other pertinent constraints. These are MAX-{A} and MAX-{I} or MAX-{U}. The first of these tries to ensure that the vocalic element of the diphthong (i.e. /a/) shows up in the output; the second and third constraints militate for the preservation of the glide elements (i.e. /j/ and /w/, respectively) (ibid: 412). Moreover, Rosenthall argues that mid vowels and front round vowels result from combinations of the vocalic features {I}, {U} and {A}. Similarly, Harris (1994) believes that three main elements are chiefly responsible for the representation of vowels. Harris says that "the independent phonetic exponents of these elements are the three 'corner' vowels *a*, *i*, and *u*" (p. 97). These three elements are conventionally symbolised as **A**, **I**,and **U**, respectively. Any particular vowel can either be a 'simplex expression', consisting of one element; alternatively, a vowel can be a 'compound', comprising a "**fusion**" of two more vowels. For instance, a fusion of A with I produces *e*, while fusing A with U gives rise to *o*. In other words, A, I, and U characterise primary colours which can be mixed to give secondary colours like *e* or *o*. In Zulu, to take a concrete example, appending the proclitic na- 'and, with' to a noun beginning with a vowel results in alternations like *na-inkosi* → *nenkosi* 'and the chief' and *na-umuntu*→ *nomuntu* 'and the person' (Harris 1994: 99).

A comparable operation is also attested in the diachronic monophthongization whereby Early Modern English diphthongs *ay* and *aw* changed into *ɛ:* and *ɔ:*, respectively. Consider, for example, the head words BAITand CAUGHT[8], as represented in (7).

(7) Earlier > later English
ay > ɛ: BAIT
aw > ɔ: CAUGHT (Harris, 1994: 99)

According to Harris (1994), such kind of process as depicted in (7) is analysed as the "compacting of sequentially ordered elements into a single melodic expression." The first part in the diphthongs *ay* and *aw* contains a skeletal position filled by A; the second part, on the other hand, contains an off-glide represented by I (= y) or U (= w). As can be seen in (8), merging these elements yields a long mid-vowel associated with two positions.

(8)



[8] Here, these two words are treated as being representative of a class of words that contains the sounds *ɛ:* and *ɔ:*. Words in the BAIT class are usually spelt with <ai> or <ay>, as in <bait, maid, day, stay>. Words in the CAUGHT set can be spelt with <au, aw, augh, ough, all>, as can be seen in words such as <taut, trawl, caught, bought, call> (Harris, 1994: 99).

Afterwards, the monophthongal result of the process depicted in (8a), i.e. ɛ:, combined with *e:*. This vowel and its back counterpart *o:* subsequently underwent some diphthongization processes, the results of which can be heard as different manifestations in several contemporary dialects of English (ibid: 100). The main changes are as follows:

(9) e: > ey > ay BAIT = MATE
o: > ow > aw BOAT

The previous mid monophthongs are still preserved in some dialects of Scotland, Ireland, and in some areas of England (mainly in the North and West) (ibid).

Taking these observations into account and given the close relationship between high vowels and glides, we can see that the long mid monophthongs in (1a-b) are actually an amalgam of /a/ and /j/ (1a), or /a/ and /w/ (1b). Gaber (2012) introduced the constraint COMBINE {A, I}[9], which combines features of both the vowel and the glide. The vowels of the optimal candidates (e.g. keef, xoof) have features of both /aj/ and /aw/, respectively. Candidates that fail to satisfy high-ranking NO-DIPH and COMBINE are excluded. The interaction between the relevant constraints is illustrated by tableau (10).

(10)

Input: /kajf/	NO-DIPH	COMBINE{ A, I}	MAX-{A}	MAX-{I}
a. • • keef			*	*
b. kaaf		*!		*
c. kiif		*!	*	
d. kajf	*!	*		

The actual output (10a) respects top-ranking constraints, so it is not affected by violating both MAX-{A} and MAX-{I}. (10b), by contrast, fails to combine features of /a/ and the glide and is excluded as a result. Similarly, (10c) is disqualified on a violation of COMBINE. Finally, fully faithful (10d) is ousted due to violating both NO-DIPH and COMBINE.

What has been said about the forms in (1a) is also applicable to those in (1b); the same constraints can be used. The only two minor differences are that with the constraint COMBINE instead of using {I}, {U} is made use of. Likewise, rather than using MAX-{I}, MAX-{U}, which does a similar job to that of MAX-{I}, is utilised. Thus the form *xawf* in (1b. i) monophthongizes to *xoof* rather than to any other form. Let us see that more closely through tableau (11).

[9] This, of course, can be COMBINE {A, W}, when forms that contain the glide /w/ are involved.

(11)

Input:/*xawf*/	NO-DIPH	COMBINE {A, U}	MAX-{A}	MAX-{U}
a. • • xoof			*	*
b. xaaf		*!		*
c. xuuf		*!	*	
d. xawf	*!	*		

Similar to what has been said about tableau (10), violating low-ranking MAX-{A} and MAX-{U} does not affect the status of (11a) as the actual output. By contrast, not respecting the other two constraints causes candidates (11b, c, and d) to be ruled out.

4. Constraint Unification

We have seen that COMBINE{A, I} and COMBINE{A, U} do a similar job and that they only differ in terms of the input forms and the candidates to be evaluated. So, for the sake of Occam's razor, it seems that it is better if these constraints are unified. By doing this, we end up with only one constraint instead of two similar ones.

The last half of the paragraph above tableau (10) together with footnote [(4)] clearly show that we need to merge features of both the vowel /a/ and the following glide /j/ or /w/. The ultimate goal, therefore, is to combine these features. Accordingly, we can simply use the constraint COMBINE{FEATURE}, which penalises output forms in which features are not intermixed. This constraint is stated in (12).

(12) COMBINE{FEATURE}
Assign one violation mark to every candidate where features are not combined.

What has been said about COMBINE{A, I} and COMBINE{A, U} is also applicable to MAX-{A} and MAX-{U}. Once more, the aim is to preserve the features of the vowel and the immediately following glide. Here as well, it seems that we should take linguistic parsimony into consideration and collapse the two MAX constraints into one. This constraint is introduced in (13).

(13) MAX-FEATURE
Every feature in S1 has a correspondent in S2. (Rosenthall 2006: 410)

This constraint militates against output forms in which features are not preserved. The following tableau illustrates how the relevant constraints interact.

(14)

Input: /kajf/	NO-DIPH	COMBINE{F}	MAX-{F}
a.☞keef			**
b. kaaf		*!	*
c. kiif		*!	*
d. kajf	*!	*	

MAX-FEATURE means that the features of the given segment should be maximally preserved in the output form. This is to say that a high vowel, say, should remain high; an open vowel should not turn out to be close, and so forth. The actual output (14a) respects both NO-DIPH and COMBINE{F}, but it incurs two violations of MAX-{F}. This is an indication that MAX-{F} should be placed at the bottom of the hierarchy. Candidate (14b) is excluded on a violation of COMBINE{F}. Likewise, (14c) is ousted because it takes no notice of this same constraint. Finally, fully faithful (14d) is ruled out as it does not respect NO-DIPH.

The same is also true of the forms in (1b), i.e. forms that monophthongize the diphthongal sequence /aw/ to the long vowel [oo]. This means that we can, once again, be more economical and make use of one tableau to account for the monophthongization of forms with the sequence /aj/ and /aw/ in the input to yield forms with long vowels [ee] and [oo], respectively, as output forms. This can be seen by looking at tableau (15).

Input: /kajf/	NO-DIPH	COMBINE{F}	MAX-{F}
a.☞keef			**
b. kaaf		*!	*
c. kiif		*!	*
d. kajf	*!	*	
Input: /*xawf*/			
a.☞xoof			**
b. xaaf		*!	*
c. xuuf		*!	*
d. xawf	*!	*	

A fleeting look shows that the lower part of tableau (15) is in fact a mirror image of the upper part. The very same constraints have been used to evaluate candidates belonging to two different input forms.

5. FINAL-C and CV

We have argued that no monophthongization is witnessed in forms like *ʒaw*,*ħaj*, etc. (cf. 4a-b). This was attributed to the domination of FINAL-C. It should be noted that this constraint makes an opposite requirement to that of the widely attested constraint NO-CODA. This latter constraint requires that syllables end in a vowel. Moreover, it is well-known that languages generally prefer coda-less syllables. Any language that has closed syllables will certainly have open syllables; the reverse situation does not hold, however (Sloat et al 1978: 62; Clements and Keyser 1983: 28; Ito 1989: 222; Kager 1999: 93; Reimers 2014: 79). This can be schematised as in (16):

(15) CVC Ɔ CV

The existence of syllables that have codas implies the existence of syllables that lack them, but not the other way round. Jakobson (1962: 526) claims "there are languages lacking syllables with initial vowels and/or syllables with final consonants, but there are no languages devoid of syllables with initial consonants or of syllables with final vowels."

Taking this observation into account, we may argue that the dialect could have deleted the glide and opted for the universally unmarked structure that lacks a coda. Such a strategy would result in forms like, for example, **ʒa*, **ħa*, etc. Asterisking these forms indicates that the dialect does not tolerate coda deletion. In optimality theoretic terms, this means that NO-CODA is a dominated constraint in the dialect under scrutiny.

(16)

Input: /ʒaw/	FINAL-C	NO-CODA
a. ▪ʒaw		*
b. ʒa	*!	

(17a), with the diphthong intact, surfaces as the optimal candidate. (17b), on the contrary, is excluded from the competition.

6. Conclusion

The dialect under scrutiny does not tolerate word-nonfinal diphthongs. Thus, the diphthongs /aj/ and /aw/ monphthongiz to [ee] and [oo], respectively. The quality of the diphthongs changes but their quantity is intact: both diphthongs and long vowels are bimoraic. Diphthongs remain intact word-finally. This is under duress of the constraint FINAL-C, which favours words that end in a consonant or a glide. FINAL-C enjoys a higher rank than the widely attested constraint NO-CODA, since forms violating NO-CODA but respecting FINAL-C are chosen as actual output forms.

The vocalic element of the diphthong (i.e. /a/) must be preserved in the output form. Likewise, the glide elements (i.e. /j/ and /w/) should surface in the output form. The long mid monophthongs attested in the output forms are actually an amalgam of /a/ and /j/ or /a/ and /w/. This is the responsibility of the markedness constraint COMBINE which optimises output forms having features of both the vowel and the glide. The relevant data are contained in the analyses discussed in this paper.

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