Some Assimilatory Processes in Kuwaiti Arabic

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Abstract

The objective of this study is to describe and analyze the major assimilatory processes and test their occurrence in Kuwaiti Arabic (KA). The present study is primarily concerned with the major assimilatory processes of KA that previous studies have not investigated adequately. The results revealed that all the investigated assimilatory processes occur in KA, except for assibilation and umlaut. It also showed that all the applied assimilatory processes in KA are obligatory processes, except for obstruent devoicing. In addition, the study determined all the possible phonological environments for these assimilatory processes in KA. The findings also showed that there is only one case restricted to Kuwaiti Bedouin Arabic (KBA) when applying vowel (fronting) harmony; however, many other cases of vowel harmony are applied by all the varieties of KA. The present study provided evidence that explains the occurrence of the tested assimilatory processes and supports the accuracy of the phonological environments that allow or block their application in KA.

Keywords*:* Kuwaiti Arabic, assimilatory process, assibilation, umlaut, obstruent, vowel harmony, fronting.

1.Introduction

Arabic dialects spoken in the Arab World differ from each other even within the same Arab country (Abdo, 1969). Each dialect has its own inventory of phonemes in addition to some processes that may not exist in other dialects. To understand the phonological structure of any dialect it is necessary to take a closer look at its phonological processes and the reasons and conditions behind their occurrence. Khalaf (1989: 3) argued that any language reflects the culture, history, identity, and heritage of its speakers. Mother languages can be identified from their daughter languages; for instance, the Arabic dialects are recognized from the way the speakers use Arabic words. Some of these daughter languages have undergone major changes, while others have changed only slightly. Different languages employ different processes and rules to make sounds, and phonologists use different approaches to analyze them. Analyzing any language provides many benefits. Therefore, if any research has been done on KA, studying this dialect more adequately could also provide some benefits.

1.1 Kuwaiti Arabic

Like any dialect, KA has its phonological processes, and to understand this dialect phonologically, these processes and the reasons behind them must be analyzed. This section therefore provides an introduction to the basics of KA as an independent system before presenting more detailed analyses. There are two major dialects in Kuwait, the urban dialect, spoken mostly in the capital city of Kuwait, and the Bedouin dialect, spoken in the rest of the country. In fact, Kuwaitis use a mixture of many languages, such as Arabic, English, Persian, Turkish, and Indian when conversing with each other. Throughout Kuwait's history, Kuwaiti Arabic (KA) has been influenced by different societies and languages for political, historical, regional, social, and commercial reasons (Al-Rshaid, 2012). KA has thirty-one consonants in its inventory, whereas MSA has twenty-eight. The emphatic voiced alveolar stop /ḍ/ does not exist in KA and is realized as /ð/. KA also has two extra consonants, /g/ and /tʃ/ in addition to using the two non-Arabic sounds /p/ and /v/ only with borrowed words. Moreover, KA and MSA share both the three short and the three long vowels, while KA has an additional fourth short vowel with its long counterpart and three diphthongs.

1.2 Research Questions

The current study is restricted to investigate the assimilatory processes in KA to answer the following questions:
1.What are the assimilatory processes that occur in KA?

2. Are these assimilatory processes determined by specific phonological environments? If so, what are they?
3. Why does one process and not another occur in KA?

1.3 Research Methods: Participants and Data Collection

The sample for this study was thirty native speakers of KA that were divided into two groups, with one group of fourteen participants given particular words and statements to read and be recorded, and another group of sixteen participants interacting spontaneously in different daily situations. Since this is a descriptive study, a random sampling method was used to select group members, while ensuring that both males and females with similar ages (between 25 and 40 years old) were selected to obtain more scientific and accurate results. The data collected from these group members consisted of speech taken from family meetings, friend meetings, social events, and shop transactions. Audiocassette recorders were used with the awareness of the participants; however, care was taken to be as non-distracting as possible to secure the naturalness and spontaneity of speech. In addition to these thirty participants, the present study re-analyzed some data from previous studies, particularly that of Matar (1969, 1976) and Al-Khithri (2008), whose data were the main resource for some analyses in this study. The attention was directed to specific data in these studies to be re-analyzed. Moreover, as a native KA speaker, the researcher has also used herself as an informant of this dialect.

2. Review of Related Literature about Assimilation

Languages display processes that modify the features of a given sound, such as adding or deleting certain sounds in certain positions. Such processes were categorized by Schane (1973: 112-117) into assimilatory processes that modify the articulatory properties of the adjacent sounds and non-assimilatory processes that describe the insertion or deletion of a given feature by satisfying the phonological constraints of the language. Assimilation is one of the most natural, common phonological processes in a language and appears to occur more than any other phonological rule across languages. Many linguists investigated processes related to assimilation in many Arabic dialects, such as Irshied (1984) who studied some aspects of Arabic phonology in general and, in particular, the phonology of the Bani Hassan variety, a Bedouin Jordanian dialect. He investigated many assimilatory processes in Bani Hassan variety, such as raising, umlaut, and rounding harmony. In addition to Abu-Mansour (1987), who has dealt mainly with the syllable structure and super-heavy syllables in Arabic, especially Makkan Arabic (MA). He investigated many assimilatory processes related to syllable structure in MA, such as compensatory lengthening. Furthermore, Herzallah (1990) investigated certain assimilatory processes in Palestinian Arabic phonology, particularly the YaʕbaD variety in the north of the Palestinian West Bank. Amakhmakh (1997) in his study focused on specific aspects of the phonology of Sefrou Moroccan Arabic. His study included many phonological processes in Moroccan Arabic, such as assimilation phenomena, such as coronal assimilation, labialization, and pharyngealization, in addition to the diminutive and the broken plural. Kuwaiti Arabic was investigated by many researchers, such as Al-Khithri (2008) and Matar (1969), who described some assimilatory cases in Kuwaiti Arabic, such as emphasis spread. Matar (1969, 1976), described the phonological environment for a case of changing vowels in KA words. Some cases of palatalization in KA has been discussed by many phonologists, such as Matar (1969, 1976), Al-Ayoub (1982), and Al-Khithri (2008); however, none presented palatalization as a separate phonological phenomenon in KA nor attempted to cover its range of cases in KA.

3. Assimilatory Processes in KA

This study investigated certain assimilatory processes in KA, such as emphasis spread, nasalization, homorganic nasal assimilation, labialization, palatalization, obstruent voicing and devoicing, and fronting harmony. The following sub-sections are introducing each of these processes independently.

3.1Emphasis

Emphasis is the phonological process in which the emphatic consonant spreads its emphatic feature to the neighboring segment/s (Davis, 1995; Waston, 1999; Al-Masri & Jongman, 2004; Thomson, 2006; and many others). It is important to add that emphasis is an inherent feature in the emphatics of these Semitic languages. Moreover, many phonologists, including Harrell (1962), Sayed (1981), and Heath (1987), view emphasis spread as the effect that the emphatic consonants have on neighboring segments, particularly vowels and consonants. Arabic grammarians use many terms to refer to this process; for instance, Lehn (1963) defined the process of emphasis spreading and the raising of the tongue as 'ʔiṭbaq', the elevation of the dorsum as 'ʔistiʕla:ʔ', and the thickness or heaviness of sounds as 'tafxi:m'.

To describe this process, both Lehn (1963) and Matar (1969: 73) used the term 'tafxi:m', while the term 'taðxi:m' was used by Al-Khithri (2008: 33). Modern phonologists do not agree on how to represent these emphatics. For example, Jakobson et al (1963) used [+flat], the Sound Pattern of English (SPE), a work on phonology produced by Noam Chomsky and Morris Halle on 1968, used [+low, +back], Brame (1970) used [+rhizo, -lingual], Broselow (1979) and Hoberman (1989) used [constricted pharynx], McCarthy (1994) used [pharyngeal], and Halle (1995) and Davis (1995) used [+RTR]. Therefore, this study will adopt the features used by Halle, Davis, Broselow, and Hoberman, namely [+RTR, + constricted pharynx], to represent emphasis spread in KA.

This section is an attempt to describe and analyze emphasis spread in KA, looking at how it affects adjacent segments. It also will define the domain of emphasis spread in KA. The following sub-sections present key aspects related to emphasis spread in KA. First, plain and emphatic consonants are compared. Next, the domain of emphasis spread is presented. This is followed by an investigation of both of the directions of emphasis spread in KA: from left to right and from right to left.

3.1.1 The Domain and Direction of Emphasis in KA

Emphasis spread involves spreading the features [+RTR, +Constricted Pharynx] from a coronal consonant to color all the segments occurring within its domain (Haddad, 1984: 256). Many linguists have argued about the domain of emphasis spread. Some contend that it rarely spreads beyond an adjacent vowel, while others maintain that the domain of emphasis spread is the whole syllable (Sayed, 1981), and still others believe that it propagates beyond the syllable that contains the underlying emphatic to cover some or all of the phonological word (Heath, 1987). Thus, the primary phonological problem is to determine the extent of the spreading of emphasis. After analyzing the data, the domain of emphasis in KA was found to be the entire stem word, so this process affects stem words as well as complex words in KA. The examples in Table 1 illustrate this:

Table 1: Emphasized stem and complex words in KA

Stem words	Gloss	complex words	Gloss
[ṭi:n]	'mud'	[ṭi:nha]	'her mud'
[ðil]	'shadow'	[ðilkum]	'your (pl. m.) shadow'
[ṣɑl]	'pray (m. sg. Imp.)'	[ṣɑlɑ:tik]	'your (m. sg.) pray'
[ṣe:f]	'summer'	[ṣe:fna]	'our summer'

In sum, the emphatic consonant has the power to emphasize all the segments in the entire stem word. All the segments in the stem word carry the value of [+RTR, +Constricted Pharynx] of the emphatics in complex forms derived from the stem word and other similar transformations. The best example of this can be seen in the KA stem word [buṣal] 'onion' as well as its plural form [bṣala:t] 'onions', in which the emphatic consonant /ṣ/ emphasizes all the segments before it as well as after it in the stem word. In other words, the spreading of emphasis can be progressive, regressive or both, as in the case of the word [buṣal]. Evidence for this can be provided by comparing a word with an emphatic consonant to a similar word with a plain consonant, such as [ʕasal] 'honey', where the segments keep their original feature value and do not undergo any kind of feature change. According to Algryani (2014), the domain of emphasis spread can be the entire phonological word. The analysis of KA found that emphasis affects all the segments in stem words as well as spreading into many segments of affixes in their complex forms. However, it cannot spread across word boundaries.

Thus, KA appears to pattern similarly to Libyan Arabic, Cairene Arabic, and Palestinian Arabic in terms of the domain of emphasis spread, which is the entire phonological stem word. This is in contrast to the claims of Lehn (1963), Obrecht (1968), Ali & Daniloff (1972), and Sayed (1981), who argued that the domain of emphasis spread is the syllable (Younes, 1993: 120).

3.1.2 Left to Right Emphasis Spread in KA

Emphasis as a phonological process may spread in two directions. In left to right, or progressive spreading, a coronal emphatic sound occurs on the left side of the stem or complex word and the spreading of the emphatic feature is progressive when it assimilates the following segments in most of the word or the entire word. In KA, this type of emphasis is found in many examples, such as those in the Kuwaiti stem words shown in Table 2:

Table 2: Progressive emphasis spread in KA

Stem words	Gloss
[ṭeːr]	'bird'
[ṣɑːr]	'happened'
[ðulm]	'injustice'

In the examples in Table 2 above, emphasis spreads from the emphatic consonants on the left of the word to the entire stem word. It affects all the segments in the stem word in addition to some possible segments in attached affixes. Emphasis in KA spreads to color all the segments in the stem word and the adjacent vowels in the attached affixes. In other words, progressive emphasis does not only occur in Kuwaiti stem words, but it also occurs in complex words, as the examples in Table 3 illustrate:

Table 3: Emphasized complex words in KA

Complex words	Gloss
[ṭeːrik]	'your bird (m. sg.)'
[ṣɑːrat]	'it happened'
[ðulmkum]	'your injustice (p.)'

The complex Kuwaiti words in Table 3 are derived from the stem words shown in Table 2. These complex words were formed by attaching an affix to the original stem. This shows that in KA, emphasis spreads from left to right, applies to stem words as well as complex words, and spreads progressively to all segments (i.e., vowels and consonants) throughout the entire stem word and some attached segments in its derived forms and other similar transformations. In sum, this spreading includes the whole stem word as well as the adjacent vowels in the attached suffix. However, emphasis usually is not applied to attached consonants in the complex forms.

In fact, emphasis may affect some segments more than others. For example, vowels are always emphasized when they occur near emphatic sounds, but some vowels are usually influenced more than others. The best example of this is when the back short and long /ɑ/ occur to the right of an emphatic consonant. The following examples in Table 4 illustrate that the short /ɑ/ is usually affected more than its long counterpart by emphasis in KA:

Table 4: Emphasized words with /ɑ/ and /ɑː/ in KA

Words with /ɑ/	Gloss	Words with /ɑː/	Gloss
[ṭɑb]	'jumped (m. sg.)'	[ṭɑːb]	'got well (m. sg.)'
[ṣɑb]	'poured (m. sg.)'	[ṣɑːb]	'he was right (m. sg.)'
[ðɑn]	'expected (m. sg.)'	[ðɑːn]	'he was expecting (m. sg.)'

The examples above illustrate that in KA the short back /ɑ/ is usually affected by emphasis more than its long counterpart. Emphasis is the property of the emphatic consonant. Therefore, given that emphasis spreads to all the segments across the entire stem word, these examples show the variation in the quality of this effect on the back vowel /ɑ/. Furthermore, the front vowels /e/ and /i/ and their long counterparts are not affected by emphasis as much as the back vowel /ɑ/. The following examples in Table 5 illustrate this by comparing words containing the short front vowel /i/ with words that contain the short back sound /ɑ/, and comparing examples of words that have the long front vowels /eː/ and /iː/ with words that contain the long back vowel /ɑː/.

Table 5: Emphasized words with /e, i, and ɑ/ in KA

Words with /e/ and /i/	Gloss	Words with /ɑ/	Gloss
[ṣif]	'be in the line (m. sg.)'	[ṣɑf]	'he was in the line'
[ṣe:f]	'summer'	[ṣɑ:f]	'he was already in the line'
[ðe:f]	'guest'	[ðɑ:f]	'hosted (m. sg.)'
[ðif]	'dismiss yourself'	[ðɑ:f]	'added (m. sg.)'
[ṭi:n]	'mud'	[ṭɑ:l]	'got taller (m. sg.)'
[ṭil]	'take a look (m. sg. Imp.)'	[ṭɑl]	'took a look (m. sg.)'
[ṭe:r]	'bird'	[ṭɑ:r]	'flied (m. sg.)'
[ðim]	'involve'	[ðɑm]	'involved (m. sg.)'
[ðiːʕ]	'get lost (m. sg. Imp.)'	[ðɑːʕ]	'got lost (m. sg.)'

The examples above show that the back vowel /ɑ/ and its long counterpart are emphasized to a greater degree in an emphatic environment than the vowels /e, i/ and their long counterparts. In fact, the rounded vowel /u/ in both its short and long forms act like the back vowel /ɑ/ and is emphasized more than the vowels /e, i/, as illustrated in Table 6:

Table 6: Emphasized words with /u/ and /e, i/ in KA

Words with /u/	Gloss	Words with /e, i/	Gloss
[ṭu:l]	'height'	[ṭil]	'take a look (m. sg.)'
[ðulm]	'injustice'	[ðe:m]	'awful'
[ṣu:n]	'protect (m. sg. Imp.)'	[ṣi:r]	'be (m. sg. Imp.)'
[ṭub]	'jump (m. sg. Imp.)'	[ṭig]	'hit (m. sg. Imp.)'
[ðum]	'include (m. sg. Imp.)'	[ðir]	'harm (m. sg. Imp.)'
[ṣub]	'pour (m. sg. Imp.)'	[ṣik]	'close (m. sg. Imp.)'

In sum, the back vowels /ɑ, u/ are affected more than the front vowels /i, e/ when they undergo progressive emphasis. Moreover, these examples show the existence of progressive assimilation and the qualitative differences of the effect of this process on vowels in KA. Evidence for this type of emphasis spread can be seen clearly in the examples of emphasized words in KA compared with their plain counterparts and in the comparisons of /a, u/ with /i, e/ in tables 5 and 6 above. Phonological evidence was also given to show that the front vowels /i/ and /e/ and their long counterparts are contradictory to emphasis articulation and therefore weaken the spread of emphasis to other segments. On the other hand, the back vowels /u, and ɑ/ are affected by emphasis more because of their back position, which agrees with the retracted articulation of emphatics.

3.1.3 Right to Left Emphasis Spread in KA

In the leftward, progressive emphasis spread discussed above, the emphatic segment on the left triggers the spread and is considered to be the conditioner of the feature change of the following segments. On the other hand, emphasis spread can also occur from the right. In rightward, or regressive emphasis spread, the emphatic consonant on the right emphasizes the segments before it and is considered to be the conditioner of the feature change of the segments that precede it. This type of emphasis spread can be seen in many KA examples in both stem and complex forms. The examples in Table 7 below illustrate this type of emphasis spread in KA:

Table 7: Regressive emphasized stem words in KA

Stem words	Gloss
[muṣṭaṭi:l]	'rectangle'
[mɑṣṭarɑ]	'ruler'
[lɑṭ]	'ate greedily (m. sg.)'
[bɑṭ]	'ducks'
[be:ð]	'eggs'

The examples above show that emphasis also spreads in KA stem words regressively. Moreover, the emphatic consonant conditions the spreading and affects all the segments throughout the whole word. In the case of consonant clusters, when the plain sounds /s/ and /t/ occur in a neighboring position to the emphatic sound /ṭ/, they are emphasized and change from /s/ to /ṣ/, such as in [mɑṣṭɑrɑ], and from /t/ to /ṭ/, as in [bṣɑ:ṭ] 'carpet'. Moreover, the emphasis may spread to more than one plain consonant in the same word and change it, as in [muṣṭɑṭi:l]. The emphatic consonant spreads regressively to emphasize the plain /t/ first, so the plain /t/ becomes /ṭ/, which affects the plain /s/ and changes it to the emphatic /ṣ/. Therefore, the original emphatic consonant on the right of the word triggers the feature spreading and can change more than one plain consonant into an emphatic consonant. Regressive emphasis spread is not limited to stem words; it is also possible in complex words. This can be seen clearly in the following KA examples in Table 8:

Table 8: Regressive emphasized complex words in KA

Complex words	Gloss
[mɑṣṭɑrɑtha]	'her (sg.) ruler'
[muṣṭɑṭi:lik]	'your (m. sg.) rectangle'
[lɑṭɑt]	'ate greedily (f. sg.)'
[bɑṭite:n]	'two ducks'
[bɑ:ðat]	'ovulated (f. sg.)'

The best evidence for regressive emphasis spread in KA is provided by comparing the KA spoken form of words with their written counterparts. The examples in Table 9 offer this written, or orthographic, evidence of the regressive emphasis in KA:

Table 9: Regressive emphasized and non-emphasized words in KA

Spoken KA Stem Words	Written KA Stem Words	Gloss
[muṣṭɑṭi:l]	/mustɑṭi:l/	'rectangle'
[mɑṣṭɑrɑ]	/mɑsṭɑrɑ/	'ruler'
[ṣiṭil]	/siṭil/	'pail'
[bṣɑ:ṭ]	/bsɑ:ṭ/	'carpet'

An additional evidence can be given by comparing the change in emphasized words that have emphatic consonants with similar non-emphasized words that have plain consonants, such as in the examples from KA shown in Table 10:

Table 10: Emphasized and non-emphasized stems in KA

Plain Stem	Gloss	Emphasized Stem	Gloss
[lit]	'slap (m. sg. Imp.)'	[liṭ]	'eat (m. sg. Imp.) greedily'
[bɑs]	'enough'	[bɑṣbɑṣ]	'peeped (m. sg.)'
[ʔiðili:l]	'the humiliated man'	[ʔilħɑðḭ:ð]	'degradation'

In sum, these sections discussing the direction of emphasis spread in KA show that both progressive (left to right) and regressive (right to left) emphasis spread occur in KA. In addition, it has been shown that both of these directions of emphasis spread occur in stem words as well as complex words. The rule for emphasis spread in KA can thus be formulated as follows, in which (C) refers to the non-emphasized consonants and ([+RTR, +Constricted Pharynx] C) refers to the emphatic and emphasized consonants:

In the case of progressive emphasis spread:

C → [+RTR, +Constricted Pharynx] C/ [+RTR, +Constricted Pharynx] C _____

In the case of regressive emphasis spread:

C → [+RTR, +Constricted Pharynx] C/ _____ [+RTR, +Constricted Pharynx] C

3.2 Nasalization

One of the most common types of assimilation is the nasalization of vowels that are adjacent to a nasal consonant. Spencer (1996: 30) argued that any vowel can be affected by many types of secondary articulation. The presence of secondary modifications must be noted in nasalization in which the vowels adjacent to a nasal consonant acquire the feature of the nasal consonant. In other words, the consonant sound to which another assimilates is said to condition the change, and the adjacent vowels are the target. Nasalized vowels are a result of lowering the velum while producing the vowel by pushing part of the air through the nasal cavity. The tilde marker [˜] above the vowel is used to identify nasality.

3.2.1 Nasalization in KA

In KA, the nasalization of vowels seems to be an obligatory process, whereby an adjacent vowel acquires the features of a neighboring nasal consonant. It also appears to be a progressive (left-to-right) process more than a regressive (right-to-left) process. The following KA examples in Table 11 illustrate this:

Table11: Progressive nasalization in KA

UR	PF	Gloss
/buxnag/	[buxnãg]	'a kuwaiti traditional dress for girls that covers their hair'
/sana:ra/	[sana˜:ra]	'hook'
/simaʧ/	[simãʧ]	'fish'
/ʤiqma/	[ʤiqmã]	'sip (sg. n.)'
/no:xiða/	[no˜:xiða]	'captain'

In many examples in Table 11, such as [sana˜:ra], the preceding vowel of the nasal consonant is not nasalized as the following vowel because the preceding vowel occurs in another syllable. Therefore, only the vowels that occur in the same syllable with the nasal consonant are nasalized in KA. This evidence shows the progressive direction of nasalization in KA. The analysis of KA data interestingly revealed that the nasalization of a vowel may also occur regressively when the vowel precedes a consonant cluster that begins with a nasal consonant or when the vowel precedes a nasal consonant in the final position, as shown in Table 12:

Table 12: Regressive nasalization in KA

UR	PF	Gloss
/ṭumba:xija/	[ṭũmba:xija]	'football'
/imṭangir/	[imṭãngir]	'angry'
/ṭi:n/	[ṭi˜:n]	'mud'
/dika:n/	[tika˜:n]	'retail store'

Therefore, the nasalization of vowels in KA occurs both in progressive and regressive processes but is conditioned by different environments. In fact, it seems to be a progressive process more than a regressive process, unlike French and English where nasalization of vowels is common in vowels that precede nasal consonants, as noted by Spencer (1996: 30). Furthermore, nasalization of vowels in KA is not only a progressive process, as in the case of Standard Malay as shown by Durand (1990: 105), but in KA it occurs both progressively and regressively. The target segment that is affected by the trigger, which is the nasal consonant, is not more than one adjacent vowel in KA, as in the case of Malay where the spreading of nasalization allows the non-syllabic segments [ʔ, h, j, w] to occur between the nasal consonant and the nasalized vowel/s (Onn, 1980). Nasalization in KA affects both short and long vowels.

Moreover, KA has no nasalized vowels unless they occur as neighbors of nasal consonants, as was the case in Yoruba, where some time ago there was nasal consonant conditioning this nasalization of vowels which no longer occurs (Katamba, 1989: 94). The rule for both regressive and progressive nasalization in KA can be formulated as the following:

The rule for progressive nasalization:
V → Ṽ/ [+nasal] _____
The rule for regressive nasalization:
V→ Ṽ / _____ { [+nasal] C / [+nasal] # }

In both of the rules above, (C) refers to any consonant and the feature [+nasal] refers to a nasal consonant.

3.3 Homorganic Nasal Assimilation

Nasals are an important class of sonorant consonants. In fact, nasal sounds are articulated by the air passing through the nasal cavity by lowering the velum in which the air goes through the nose. In addition, producing nasal stops in languages is very common among other nasal sounds (Spencer, 1996: 13-14). Nasal homorganic assimilation is a very common process. The nasal assimilation of consonants can be a result of place of articulation assimilation, in which two consonants with different places of articulation share the same place of articulation. According to Fisiak and Puppel (1992:316), the place of articulation of the nasals in some languages agrees with those of the stops, but not the alveolar stops. Therefore, the nasal sound shares its place of articulation with the stop that follows it, excluding alveolar stops. It is essential to add that Fisiak and Puppel's definition of nasal homorganic assimilation may be applied to certain languages but not to Arabic or English.

3.3.1 Homorganic Nasal Assimilation in KA

Homorganic assimilation involves sounds that share the same place of articulation. It results in these sounds being produced with different place of articulation. For example, the place of articulation of the nasal coronal sound /n/ assimilates to the following nasal labial sound /m/ when adjacent to the labial /b/ (Katamba, 1989: 89-91). Table 13 below shows that, as a result of the process of nasal homorganic assimilation, the coronal nasal sound [n] is always substituted by the labial sound [m] when it is followed by another labial sound (in this case [b]). This rule is illustrated as follows:
n → m/ _____ b
[+coronal] ⟶ [labial]/ _____ [labial]

Table 13: Nasal homorganic assimilation in Kuwaiti Arabic words

UR	PF	Gloss
/dʒanb/	[dʒamb]	'beside, near'
/ṭunba:xija/	[ṭumba:xija]	'football'
/dʒunba:z/	[dʒumba:z]	'gymnastics'
/ðanbi/	[ðambi]	'my fault'
/qunbila/	[qumbila]	'bomb'
/kanbal/	[kambal]	'blanket'
/dunbuk/	[dumbuk]	'drums'

In Table 13 above, all the examples are single KA words; however, homorganic nasal assimilation is also found widely across word boundaries in KA, as shown in Table 14:

Table 14: Nasal homorganic assimilation in Kuwaiti Arabic: across-word boundaries

UR	PF	Gloss
/min ba:ʧir/	[mimba:ʧir]	'from tomorrow'
/min bara/	[mimbara]	'from outside'
/min be:ḍna/	[mimbe:ḍna]	'from our eggs'

Thus, homorganic nasal assimilation is found in KA words as well as across word boundaries; therefore, KA is similar to English in this aspect as noted by Spencer (1996: 152). Moreover, the analysis emphasized that in the case of homorganic nasal assimilation, the type of adjacent vowels does not affect this process. Homorganic nasal assimilation deals with consonants and does not spread to adjacent vowels as in emphasis and many other assimilatory processes. Similar to Luganda, English, and Malay, homorganic nasal assimilation in KA is not arbitrary but is an obligatory process with many reasons that justify it. According to Durand (1990: 100), one reason is that this process usually applies across morphemes and word boundaries and accepts a regressive spreading in most languages. Another reason for the prevalence of nasal assimilation for stops is that nasal homorganic assimilation is a very natural process and is widely used in many languages, including KA. The evidence used earlier to show that homorganic nasal assimilation occurs in KA compared the articulated words in KA with their orthographical forms. For the orthographic evidence, the spoken form in KA was compared to its written form, as in the comparison of the written form /min ba:ʧîr/ to the spoken, assimilated form [mim ba:ʧîr]. In the written form, the writer uses the coronal [n], but in the spoken form, the speaker uses the bilabial [m]; therefore, the change of the consonant from [m] to [n] is structural.Other evidence can be provided by comparing the articulated word to its other forms. For instance, Table 15 below compares plural and singular forms of KA words to show that the singular assimilated words lose their assimilated features and go back to their original features without undergoing any change when their plural forms are used. In other words, the bilabial [m] goes back to be the coronal [n] in the case of plurality:

Table 15: Evidence from singular and plural forms in Kuwaiti Arabic words for nasal homorganic assimilation

Singular Words in KA	Gloss	Plural Words in KA	Gloss
[qumbila]	'bomb'	[qana:bil]	'bombs'
[kambal]	'blanket'	[kana:bil]	'blankets'
[dumbuk]	'drums (sg.)'	[dana:bik]	'drums (p.)'
[ðamb]	'sin'	[ðnu:b]	'sins'

3.4 Labialization

Labialization is another assimilatory process. This process is often called rounding because the speaker rounds his/her lips before the articulation of the consonant is finished. Labialization is not primary articulation; rather, Fisiak and Puppel (1992: 323) classified labialization and other similar processes as secondary articulation, due to the fact that they give some new features to the neighboring segments that were not originally there. In other words, labialization is a secondary feature occurring when a rounded vowel, such as /o, o:, u, or u:/, follows an unrounded consonant, such as the labials /b, m, or f/, and rounds it. Labialization is indicated by the phonetic transcription [^{w}] after the consonant [C^{w}] (Katamba, 1989: 87).

3.4.1 Labials and Labialization in KA

The labial sounds in KA are /b, m, and f/. As mentioned before, labialization is a secondary articulation which requires rounding the lips as the result of a following rounded vowel. First, it is important to distinguish between KA words that contain labials and those that become labialized. Therefore, many examples of words with labials in KA have been collected, with some of these shown in Table 16 below:

Table 16: Words with labials in KA

UR	PF	Gloss
/baħa/	[baħa]	'huskiness'
/mitdo:dih/	[mido:dih]	'confused (m. sg.)'
/findʒa:l/	[findʒa:l]	'a cup of Arabian coffee'

On the other hand, many examples show that labial sounds can be also rounded (labialized) in KA, as in Table 17 below:

Table 17: Labialized words in KA

UR	PF	Gloss
/mu:s/	[mʷu:s]	'knife'
/bu:z/	[bʷu:z]	'pout'
/fu:ṭɑ/	[fʷu:ṭɑ]	'towel'

All the examples in Table 16 and Table 17 above begin with KA's labial sounds, /b, m, and f/. The examples in which these labial sounds are followed by the rounded vowel /u/ are rounded, whereas examples that are not followed by this vowel remain without rounding (labializing). Evidence for the labialization in Table 17 is provided by comparing those labialized words in Table 17 with words that also contain the rounded vowel /u/ but do not begin with the labial sounds /b, m, or f/ in Table 18:

Table 18: Unrounded words with rounded vowels in KA

UR	PF	Gloss
/su:g/	[su:g]	'market'
/su:r/	[su:r]	'wall'
/ʕu:d/	[ʕu:d]	'a twig'
/nu:r/	[nu:r]	'light'

As the examples in Table 18 do not begin with labial sounds, the first consonant is not labialized. Therefore, KA seems to operate in labialization like Morrocan Arabic, as noted by Amakhmakh (1997: 55- 57). Other evidence for this process in KA can be seen in that labialization is not affected by the structural change of the broken plural formation of these labialized words, as in the examples in Table 19 below:

Table 19: Labialized singular and plural words in KA

Singular forms	Gloss	Broken plural forms	Gloss
[mʷu:s]	'knife'	[mmʷa:s]	'knifes'
[bʷu:k]	'wallet'	[bbʷa:k]	'wallets'
[bʷu:z]	'pout'	[bbʷa:z]	'pouts'
[fʷu:ṭa]	'towel'	[ffʷaṭ]	'towels'

In sum, labialization in KA can be seen in Table 19, in which the labialized singular words remain labialized in their plural forms. The rule for labialization in KA can be formulated as follows:
/b, m, f/ → [bʷ, mʷ, fʷ]/ # _____ u:
Or
[labial] → [labial]ʷ/ # _____ [+round, +back, +high]

3.5 Palatalization

Palatalization is another very common assimilatory process that changes sounds. This process adds a palatal feature to non-palatal consonants. According to Hankamer (1988: 105), palatal sounds are defined by the primary features [+high, -back], as palatals are produced when the front of the tongue contacts the hard palate or when the blade of the tongue makes contact with the back part of the alveolar ridge, as in the case of palato-alveolar. Unlike the palatal consonants, palatalized consonants have secondary articulation.

3.5.1 Palatalization in KA

Palatalization in KA has been discussed by many phonologists who looked at various aspects of palatalization in many languages. However, none of these studies investigated its occurrence in KA thoroughly enough to provide solid analyses or explanations. For instance, Al-Ayoub (1982), Al-Khithri (2008) and Al-Qinaei (2011) argued that the urban Kuwaitis palatalize the palato-alveolar /dʒ/ and make it the palatal [j] in certain cases. However, this is a social variation and cannot be explained phonologically or given a rule to determine its phonological environment.

According to Matar (1969), palatalization, or as he called it 'kaʃkaʃah', in KA and many other Arabic dialects and other languages, usually occurs regressively and is related to a following front vowel (ibid: 42-43). However, the analysis of data found many cases of progressive as well as regressive palatalization in KA. Palatalization occurs in KA, and this study seeks to identify the specific cases. A case of palatalization in KA is found when the velar [k] becomes the palato-alveolar [ʧ]. An environment that creates the palato-alveolar sound /ʧ/ is when the velar /k/ is adjacent to a front vowel. In this case, the front vowel /i/ and its long counterpart can occur either before or after the palato-alveolar sound, as shown in Table 20 below:

Table 20: Palatalization in KA

Without Non-front Vowels	Gloss	With Front Vowels	Gloss
[mba:rak]	'Mubarak'	[mbe:ri:ʧ] 'diminutive'	'Mubarak (m. name)'
[markab]	'boat'	[mre:ʧi̇b] 'diminutive'	'small boat'
[kba:r]	'old (p)'	[ʧi̇bi:r]	'old (m. sg.)'
[ʔakram]	'more generous'	[ʧi̇ri:m]	'generous (m. sg.)'
[kala:m]	'talk'	[ʧi̇lma]	'word'
[mṣakar]	'closed'	[saʧi̇:n]	'knife'
[ʔasla:k]	'wires'	[di:ʧ]	'rooster'

The examples above show that the velar /k/ is palatalized when it is adjacent to the front vowels /i/, /i:/ or /e:/ and remains velar in other environments. Front vowels were therefore found to be the trigger for palatalization in KA words. Moreover, this process occurs either progressively or regressively.

Velar /k/ → palato-alveolar [ʧ] / _____ [+high, -back] V

Velar /k/ → palato-alveolar [ʧ] / [+high, -back] V _____

In fact, palatalization takes place in these environments because the front vowel attracts the velar sounds and pushes them to a high position during articulation. The evidence of this process can in fact be found in Table 20 above. The front vowel /i/ plays a major role in palatalizing the velar /k/ to the palato-alveolar [ʧ], both progressively and regressively. Therefore, the occurrence of the front vowel determines palatalizing /k/ to [ʧ] in KA.

3.6 Obstruent Voicing and Devoicing

Obstruent voicing occurs when an obstruent is voiced in any environment other than between two sonorants, while obstruent devoicing occurs when a voiced obstruent loses its voicing when adjacent to a voiceless obstruent (Katamba, 1989)**.** According to Katamba (ibid), any language that allows obstruent voicing allows obstruent devoicing as well. Obstruents, which are plosives, fricatives, and affricates, are the true consonants. Sonorants, on the other hand, are resonant, and include approximants, nasals, and vowels. As obstruent voicing and devoicing occur in many different languages, this section aims to determine whether they also occur in KA.

3.6.1 Obstruent Voicing in KA

In KA, obstruent voicing differs from obstruent voicing in many other Arabic dialects. Obstruent voicing is an obligatory process in KA. For example, the voiceless emphatic /ṣ/ becomes the voiced /z/ only in one specific case in KA. This example is found in /ṣaɣi:r/ 'small (sg.)' in MSA, which becomes [(ʔi)zɣi:r] 'small (sg.)' in KA and /ṣiɣa:r/ 'small (pl.)' in MSA, which becomes [(ʔi)zɣa:r] 'small (pl.) children' in KA because the voiceless emphatic obstruent /ṣ/ is adjacent to sonorants. Therefore, the rule will be formulated as the following:

$$ṣ \rightarrow z / \begin{bmatrix} \# \\ [+sonorant] \end{bmatrix} \_\_\_\_\_ [+sonorant]$$

This is one of the general obstruent voicing rules in KA; however, there are a limited number of examples showing words in which the voiceless emphatic /ṣ/ is followed by the sonorant /ɣ/. In addition, there are other obstruent voicing rules in KA. For example, the voiceless uvular stop /q/ in MSA becomes the voiced palato-alveolar affricate [ʤ] in KA when it is adjacent to sonorants, as shown in Table 21:

Table 21: Voicing /q/ to [ʤ] in KA

MSA	KA	Gloss
/ʕirq/	[ʕirʤ]	'vein/strain (s.)'
/ri:q/	[ri:ʤ]	'saliva'
/ɣa:miq/	[ɣa:miʤ]	'dark'

Analyzing this data shows that KA voices /q/ to [ʤ] when it is adjacent to sonorants. However, Al-Khithri (2008: 26-27) argued that KA speakers usually voice the voiceless /q/ and make it the voiced /ʤ/ when it is followed by the voiced /d, r, or j/. This might be true, but it also happens with many other sounds in addition to these voiced consonants (/d, r, or j/), as in [ɣa:miʤ]. Moreover, the examples provided here show that the voicing of /q/ to [ʤ] in KA occurs when adjacent to front vowels. In other words, the voiceless /q/ is always voiced and becomes /ʤ/ in KA when it is adjacent to or surrounded by sonorants (if the sonorants are vowels, they are usually front vowels). The rule can be formulated as follows:

/q/ → [ʤ] / [+sonorant] _____ [+sonorant] / Condition: [-back] V
/q/ → [ʤ] / _____ [+sonorant] / Condition: [-back] V
/q/ → [ʤ] / [+sonorant] _____ / Condition: [-back] V

Another case of obstruent voicing is voicing the voiceless uvular stop /q/ to the voiced uvular fricative [ɣ] when adjacent to sonorants. According to Matar (1969: 33- 34), one of the main characteristics of KA is the switching between the uvular sounds /q/ and /ɣ/, where /ɣ/ is replaced with /q/, and /q/ is replaced with /ɣ/. Moreover, this phenomenon also takes place in the dialects of Sudanese tribes. However, in the Egyptian language these two sounds, /q/ and /ɣ/, are both replaced by the voiceless glottal stop /ʔ/ in all positions (ibid). In KA, the stop /q/ is voiced to /ɣ/ when it is adjacent to sonorants. In some cases, the resulting sound is entirely /ɣ/, and in other cases the resulting sound is between /q/ and /ɣ/, but its articulation is closer to /ɣ/ than /q/. In other words, the occurrence of any adjacent sonorant in KA words predicts the occurrence of voiced obstruents or a voicing obstruent process. Many examples can be found in KA to display this phenomenon, as in the examples in Table 22 below:

Table 22: Voicing /q/ to /ɣ/ in KA

UR	FP	Gloss
/qalam/	[ɣalam]	'pen/pencil'
/muɣlaq/	[muɣlaɣ]	'closed (m. sg.)'
/ʔistiqla:l/	[ʔistiɣla:l]	'independence'
/ṭalqa/	[ṭalɣa]	'bullet'
/qird/	[ɣird]	'monkey'
/qirʃ/	[ɣirʃ]	'shark'

Table 22 provides many examples of voicing a voiceless obstruent when adjacent to sonorants, with KA changing the voiceless stop /q/ into the voiced fricative /ɣ/ when it is adjacent to sonorants. This illustrates how KA operates differently than many languages, such as the dialects of Sudanese tribes, in which the voiceless /q/ is changed to the voiced /ɣ/ in all environments.

The rules of obstruent voicing in KA can be formulated as follows:

/q/ → [ɣ] / [+sonorant] ___ [+sonorant]
/q/ → [ɣ] / ___ [+sonorant]
/q/ → [ɣ] / [+sonorant] ___

This alternation between /q/ and /ɣ/ does not occur as result of mistaken articulation, but as a result of a voicing process and a development in KA sounds. The phonological explanation for this phenomenon is that the voiceless /q/ and the voiced /ɣ/ share the same place of articulation, namely uvular. The historical explanation of this phenomenon, according to Matar (ibid: 35-36), is found in many examples in MSA. Some examples, such as /tazajaqat/ and /tazajaɣat/ 'renewed her makeup (f. sg.)' in MSA, were once pronounced as /q/, and in other times as /ɣ/. Other evidence is found in KA where the voiced fricative uvular /ɣ/ remains /ɣ/ without change when adjacent to sonorants, as shown in Table 23 below:

Table 23: KA words remaining without obstruent devoicing

MSA	KA	Gloss
/luɣa/	[luɣa]	'language'
/ɣurza/	[ɣirza]	'stitch'
/ɣil/	[ɣil]	'malevolence'
/ɣurb/	[ɣurb]	'strangers'
/ɣajr/	[ɣe:r]	'different'
/ɣurfa/	[ɣurfa]	'room'
/ʔaɣra:ḍ/	[ʔaɣra:ð]	'things'

Table 23 shows that, in KA, the voiced /ɣ/ remains without change when adjacent to sonorants. Therefore, the position of the obstruent sound to the sonorants determines whether it changes or not. Another example of this phenomenon is found in the KA word [laɣlu:ɣ] 'necklines', which remains without change as a result of being surrounded by sonorants. This is similar to English, where words such as [mrdl] 'myrtle' are voiced as a result of being surrounded by sonorants.

3.6.2 Obstruent Devoicing

According to Spencer (1996), Katamba (1989), and other linguists, obstruent devoicing devoices the voiced obstruents that are adjacent to other voiceless obstruents and makes them voiceless. Similar to obstruent voicing, the position of the target obstruent affects its voicing power as much as its position to the other adjacent voiceless obstruents.

3.6.2.1 Obstruent Devoicing in KA

Some cases of obstruent devoicing are found in KA in specific phonological environments. For example, in KA, the voiced alveolar stop /d/ is devoiced to its voiceless counterpart /t/ when it occurs word-initially and is followed by the short high vowel /i/ and then the voiceless velar stop /k/, which conditions this devoicing. Many examples are found in the underlying representations when compared with their phonetic forms in KA, providing evidence. Some examples of this are provided in Table 24 below. The forms in the underlying representation are used by KA speakers in their fast-casual speech as well as their written forms, and this also provides orthographic evidence.

Table 24: Obstruent devoicing in KA

UR	PF	Gloss
/diktu:r/	[tikto:r]	‘doctor (m.)'
/dika:n/	[tika:n]	‘grocery’
/dikta:to:rija/	[tikta:to:rija]	'doctorate'

As shown in Table 24 above, in KA, the words 'doctor' and 'dictator' are pronounced as [tikto:r] and [tikta:to:r] rather than /dikto:r/ and /dikta:to:r/. In these examples, KA speakers devoice the sound /d/ to [t], which is the sound used in the same environment in MSA and many other Arabic dialects, such as Jordanian and Egyptian. Another example from Table 24 is the word /dika:n/ 'grocery', which is pronounced as [tika:n] in KA, where the /d/ is devoiced to /t/. These examples support the assumption that words that begin with the obstruent /d/ and are followed by the high front vowel /i/ and then the voiceless obstruent /k/ are devoiced in KA. A phonological rule for this case can be formulated as follows:

/d/ → [t] / # ____ /i/ k

Or

[+voiced] stop → [-voiced] / # _____ /i/ [-voiced] stop

It is important to add that this rule does not apply to the other voiced stops, which are /b and g/, because the voiceless bilabial stop /p/ does not occur in the KA consonantal sound inventory and is found only in non-Arabic borrowed words; therefore, the voiced /b/ cannot be devoiced to its voiceless counterpart /p/. Moreover, the voiced velar stop /g/ usually reflects the voiceless uvular stop /q/ in KA, which is also considered to be a separate phoneme in KA, so cannot be devoiced from the voiced velar stop /g/ to its voiceless counterpart /k/. In other words, this phenomenon is restricted to devoicing the voiced alveolar stop /d/ to its voiceless counterpart /t/ in KA when /d/ occurs word initially and is followed by the short front vowel /i/ and then the voiceless velar stop /k/.

This alternation can be seen clearly in KA careful speech, where /d/ is pronounced, and in KA fast-casual speech, where it is devoiced to /t/. Moreover, the voiced /d/ is used by KA speakers in their written forms, providing orthographic evidence and emphasizing the occurrence of this alternation in KA. It is also essential to stress that this case of obstruent devoicing is optional in KA and is only applied in fast-casual speech and not in formal or careful speech.

3.7 Vowel Assimilation (Vowel Harmony)

Vowel harmony is an assimilatory process that occurs in many languages. In this process, some vowels change the other vowels to make harmony. Phonologists have examined this process in many languages and have found many types of vowel harmony, which are rounding, fronting, raising and lowering. One case of fronting the non-front vowels occurs when there is an /i/ in the word and all the other vowels in the word change to /i/ to achieve vowel harmony. This case is common in many languages, and the next sub-section discusses how fronting harmony is used in KA. Fronting harmony was chosen because it is one of the most common vowel harmony rules that is used by KA speakers. The following sub-sections first investigate fronting harmony in Kuwaiti dialects and then explain how this process operates in KA.

3.7.1 Fronting Harmony in KA

Vowel harmony as a fronting process is not always found in all Kuwaiti varieties. Some cases are applied by all KA speakers, while others are only applied to the Bedouin dialect. This process can be seen in many examples in which the speakers front all the non-front vowels in order to make a vowel/fronting harmony. According to Matar (1976: 37-48), KA nouns are fronted when they have a bi-consonantal cluster and the first consonant in the cluster is not one of the five sounds /m, n, l, r, and b/. For instance, all KA varieties front [ʔisim] 'name', which in MSA and many other Arabic dialects, such as Eygptian Arabic, is pronounced as /ʔism/, and [siħir] 'magic', which is pronounced in MSA and some Arabic dialects as /siħr/. Examples that involve these five sounds yet remain without fronting include [milħ] 'salt' and [bint] 'girl', which are pronounced the same in MSA and KA. The explanation for this is that the rule is blocked when two of the five sounds /m, n, l, b, and r/ occur after each other. For example, all KA speakers front [ħibir] 'ink'; however, it is un-fronted in MSA and some Arabic dialects and pronounced as /ħibr/.

From re-analyzing these examples, it is possible to state that all the examples are bi-syllabic and that the /i/ after the first consonant spreads progressively to be inserted and follow the second consonant, which has no vowel, to make some type of harmony between them. Moreover, in addition to having an original /i/ in the word, which makes harmony with the new added /i/, KA prefers the high front vowel /i/ over the other vowels (Matar, 1969: 54); therefore, it is this vowel that is inserted. This evidence provides the information required to formulate a phonological rule for this phenomenon in KA as follows:

$\emptyset \rightarrow$ i / CiC _____C. /Condition: the 2nd C is not /m, n, l, r, or b/.

[bi-syllabic]

It is also important to add to Matar's analysis that in this particular case, a vowel is usually inserted into a word before undergoing fronting harmony. In other words, the speaker needs to insert a vowel into the word in order to break up its bi-consonantal cluster and ease articulation. In addition, the choice of the inserted vowel is not arbitrary. Therefore, the fronting harmony rule follows vowel insertion. Another case of fronting harmony is restricted to Kuwaiti Bedouin Arabic (KBA). The following examples in Table 25 were chosen and compared with MSA to illustrate this phenomenon.

Table 25: Fronting harmony in Kuwaiti Bedouin Arabic

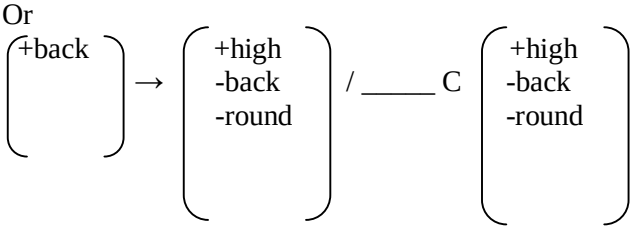
MSA	Kuwaiti Bedouin Arabic	Gloss
/(ʔi)smaʕ-i/	[(ʔi)smiʕi]	'listen (f. sg. Imp.)'
/(ʔu)ktub-i/	[(ʔi)ktibi]	'write (f. sg. Imp.)'
/(ʔi)fham-i/	[(ʔi)fhimi]	'understand (f. sg. Imp.)'
/(ʔu)drus-i/	[(ʔi)drisi]	'study (f. sg. Imp.)'

The analysis of these examples reveals that fronting harmony occurs only when addressing a female with imperatives in words taken from MSA and used in KBA. In other words, examples that are not taken from MSA did not undergo fronting harmony, such as [kansili] 'cancel (f. sg. Imp.)', which is borrowed from English.

Therefore, the fronting harmony process occurs only when addressing females with imperatives in KBA. The rule for this phenomenon can be formulated as follows:

/a, u/ → [i] / _____ C /i/

Or



On the other hand, unlike addressing females with imperatives in KBA, fronting harmony does not occur in all cases when addressing males with imperatives in KA. The examples in Table 26 illustrate this:

MSA	Kuwaiti Bedouin Arabic	Gloss
/(ʔi)smaʕ/	[(ʔi)smaʕ]	'listen (m. sg. Imp.)'
/(ʔi)fham/	[(ʔi)fham]	'understand (m. sg. Imp.)'
/(ʔi)ʃrab/	[(ʔi)ʃrab]	'drink (m. sg. Imp.)'

Table 26: Addressing males with imperatives in KA: without vowel harmony

The examples in Table 26 above show that when any person addresses a male with imperatives, fronting harmony does not occur. However, there is an exception to this case, whereby fronting harmony is sometimes applied when addressing males with imperatives in KA as well as in KBA, as shown in Table 27:

Table 27: Addressing males with imperatives in KA: with vowel harmony

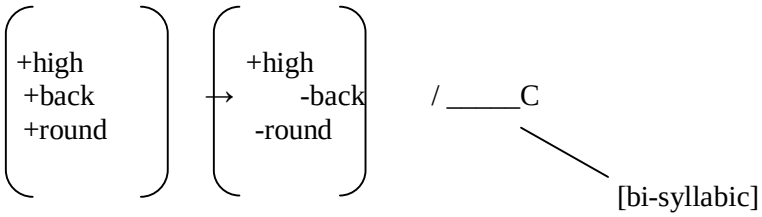
MSA	KA	Gloss
/(ʔu)ktub/	[(ʔi)ktib]	'write (m. sg. Imp.)'
/(ʔu)dxul/	[(ʔi)dxil]	'come in (m. sg. Imp.)'
/(ʔu)drus/	[(ʔi)dris]	'study (m. sg. Imp.)'

The examples in Table 27 above show that when the imperatives in MSA have only rounded vowels, in KA they are changed to unrounded front vowels. Evidence for this case can be found in many words taken from MSA that remain unchanged in KA because KA prefers the high front vowel /i/ over the other vowels. For instance, /ʔiksir/ 'break (m. sg. Imp.)', /ʔiɣsil/ 'wash (m. sg. Imp.)', and other similar words are used in KA without undergoing any structural change. The rule for this phenomenon can be formulated as follows:

/u/ → [i] / ____ C

[bi-syllabic]

Or



In sum, all the cases of making imperatives in KA undergo many processes before applying the fronting harmony rule. In MSA, there are many ways to break a bi-consonantal cluster in a word; for example, using the rounded vowel /u/ when it is followed a closed syllable containing /u/, and using the front unrounded vowel /i/ when it is following a closed syllable containing either /i/ or /a/. In contrast, KA prefers the high front vowel /i/ to break up a bi-consonantal cluster in most of the KA words. In addition, there are some cases in KA where the central low vowel /a/ is fronted to become /i/ to make fronting harmony. The following examples in Table 28 are based on the examples of vowel harmony in KA by Matar (1969: 66-67) and have been re-analyzed. The examples of KA are compared with their MSA counterparts to provide evidence of the phenomenon of fronting harmony in KA.

Table 28: Fronting harmony in KA

MSA	KA	Gloss
/ṭari:q/	[ṭiri:ʤ]	'path'
/rafi:q/	[rifi:ʤ]	'friend (m.)'
/ʤadi:d/	[ʤidi:d]	'new (m. sg.)'

In the examples above, the first vowel is changed from /a/ to /i/ in bi-syllabic words: the first syllable is an open syllable and the second syllable contains the high front vowel /i:/, which spreads to the previous syllable and changes its vowel with a similar vowel to make harmony. KA is slightly similar to the Banni Hassan dialect and to Saudi and Levantine Arabic, according to Irshied (1984), in which the presence of an /a-i/ pattern of stem is present. Moreover, KA shares with Saudi dialects the changing of the vowel /a/ to /i/, which takes place in a syllable followed directly by another syllable containing /i/. These examples provide evidence to formulate a phonological rule for this type of fronting harmony as follows:

/a/ → [i] / C _____ Ci:C

[bi-syllabic]

Or

+low
+back
-round

→

+high
-back
-round

/ C___Ci:C

[bi-syllabic]

In sum, in KBA in particular and KA in general, fronting harmony is an obligatory process. In specific environments, all KA speakers insert the high front vowel /i/ in order to achieve vowel harmony. On the other hand, addressing females with imperatives is only an obligatory process when applied by KBA speakers. For example, when addressing females with imperatives, speakers usually change all the vowels to /i/, whereas when addressing males with imperatives only the high back rounded vowel /u/ is changed to /i/. Examples from words borrowed from MSA were used to capture a structural change resulted by fronting harmony and provide evidence for this phenomenon.

It is important to stress that addressing females with imperatives undergoes vowel harmony only by KBA speakers, while addressing males with imperatives undergoes vowel harmony by all KA speakers. Moreover, evidence was provided to show the cases where vowel/fronting harmony can be used when addressing males with imperatives in KA, such as when using words taken from MSA that already have fronting harmony and therefore remain unchanged when used by KA speakers.

4. Conclusion

The main objective of this study was to provide a description of the phonology of Kuwaiti Arabic (KA). This study focused on the most common assimilatory processes in order to test their occurrence in KA. It was possible to present all the tested processes, with the exception of assibilation and umlaut, which were found to not exist in KA. All the tested assimilatory processes were found to be obligatory, with the exception of obstruent devoicing. These processes occur progressively, regressively, or both in KA. All the assimilatory processes, including fronting harmony, are applied by all KA speakers; however, there are some specific cases of fronting harmony that are only applied by the Kuwaiti Bedouin Arabic (KBA) variety. The data also revealed that fronting harmony in KA is usually preceded by vowel insertion, but the choice of the inserted vowel is controlled by the other vowels in some cases and by the most preferable vowel in this dialect, which is /i/, to achieve vowel harmony. In addition, this study reviews a phonological description of the more common phenomena in KA to provide a solid foundation for further investigations.

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Appendix 1:
Abbreviations and Symbols

Abbreviations

bi-syl	bi-syllabic
f.	female
m.	male
Imp.	Imperative
n.	noun
Pres.	Present tense
Past.	Past tense
sg.	singular
p.	plural
KA	Kuwaiti Arabic
Syl	Syllabic
UR	Underlying Representation
PF	Phonetic Form
C	Consonant

Distinctive Features

Bk	back
rd	round
H	high
L	low
M	mid
cont	continuant
cons	consonantal
syl	syllabic
obs	obstruent
son	sonorant
RTR	retracted tongue root
CP	constricted pharynx
Cor	coronal
Ant	anterior
Voc	vocalic

Symbols

→	becomes
/	phonological environment
#	word boundary

Appendix 2:
Phonetic Symbols in KA
Consonants

IPA Symbol	**Description**
ħ	voiceless pharyngeal fricative
b	Voiced bilabial stop
t	Voiceless dental stop
d	Voiced dental stop
ṭ	Emphatic voiceless dental stop
ḍ	Emphatic voiced dental fricative
k	Voiceless velar stop
g	Voiced velar stop
q	Voiceless uvular stop
ʔ	Voiceless glottal stop
θ	Voiceless inter-dental fricative
f	Voiceless labio-dental fricative
s	Voiceless alveolar fricative
z	Voiced alveolar fricative
ṣ	Emphatic voiceless alveolar fricative
ʃ	Voiceless palato-alveolar fricative
dʒ	Voiced palato-alveolar affricate
x	Voiceless uvular fricative
ɣ	Voiced uvular fricative
ð	Voiced inter-dental fricative
ʕ	Voiced pharyngeal fricative
ʧ	Voiceless palato-alveolar affricate
m	Voiced bilabial nasal
n	Voiced alveolar nasal
l	Voiced alveolar lateral
r	Voiced alveolar flap
w	Voiced labio-velar glide
j	Voiced palatal glide
h	Voiceless glottal fricative

a	aa
i	ii
u	uu
ɑ	ɑɑ
-	ee as realization of MSA diphthong aj
-	oo as realization of MSA diphthong aw