Morpho-phonological Structure of Sound Feminine Plural: Revisited

Bassil Mashaqba (Corresponding author)

Hashemite University, Jordan

E-mail: b_mashaqba@hu.edu.jo

Anas Huneety

Hashemite University, Jordan

E-mail: hneety@live.com

Abstract

This work investigates an unusual and intriguing concatenative morpho-phonological process, which occurs in a Jordanian variety as spoken by Ahl Al-Jabal Bedouin, the native dwellers of North East Badia of Jordan. The work shows that the voiceless plosive /t/ undergoes deletion if and only if it is part of the sound feminine plural morpheme **-aat**. In the pre-pausal position, /t/ deletion is further compensated by the reproduction of the voiceless glottal fricative [h]. Phonologically, the final voiceless plosive /t/, in the sound feminine plural -aat, undergoes debuccalization by which it loses its original place of articulation [alveolar] and moves to the glottis to surface as [guttural] [h]. Glottal closure (glottalization) takes place via a glottal fricative [h] rather than a glottal stop [ʔ]. The results of this paper further prove that the phonological status of sound feminine pluralization in Ahl Al-Jabal dialect is significantly motivated by morphology, an interesting piece of evidence that certain morphological patterns operate in the phonological component, or at least require phonological implications.

Keywords: Sound feminine plural (SFP), Morpho-phonology, Jordanian Arabic, Debuccalization, Glottalization

1. Introduction

Arabic has a systematic productive morphological structure with many interesting and challenging aspects, one of which is pluralization. Although a structured derivational process that associates specific singular and plural patterns is not easy to resolve, plurality, in the nominal system of Arabic, can be expressed by the formation of an inflected form based either on modification according to a morphological template 'broken plural' or the affixation of a plural suffix 'sound plural' (cf. Ratcliffe, 2008: 440, 445; Mashaqba, 2015: 196). Theoretically, sound plural (SP) is one of the clear aspects in the literature on Arabic morpho-phonology. Broken plural (BP), by contrast, is one of the most challenging topics. The challenge stems from how morphology relates singular stems to the plurals in their surface structure by 'a series of virtual rather than real time sequence of changes' (cf. Sakarna, 2013: 48). The body of literature discussing the implications of the phonological and morphological theory on Arabic confirms that Arabic continues to challenge and help advance the study of such modern theory (cf. McCarthy, 2008: 305).

The bare noun is either singular or collective. In terms of the grammatical category of number, the mode of noun inflection is singular (unmarked/default),[1] dual,[2] or plural. Similarly, Jordanian Arabic dialects exhibit three realizations of pluralization: SP (external/ inflectional/ purely suffixal), BP (internal/ derivational/ templatic/ rearrangement of vowel melody of the singular),[3] and suppletion (involving unrelated patterns with different unrelated roots, as in: *marah* 'wife', *niswaan ~ nisaawiin* 'married women') (cf. McCarthy, 2008: 303; Weninger, 2011: 164; Mashaqba, 2015: 195).[4]

Traditional accounts (e.g. generative approaches, such as Levy, 1971) rely on different specifications to account for plural formation in Classical Arabic (CA). For example all categories that match with one of the following features [+Derived], [+Foreign], [+Alphabet Letter], [+Adj-aan] take one of the SP patterns. However, such proposals that consider sound-broken plural asymmetry have been criticized for not proposing a clear principle for BP-SP assignment. Neither traditional generalizations nor the features proposed in generative model are adequate to predict plural formation in CA (cf. Abd-Rabbo, 1990: 56-59). Subsequently, recent work has shown that the selection of SP or BP of the noun/adjective depends on its stem (McCarthy, 2008: 303).

---

[1] Being defined as the default does not mean the most frequent plural but rather 'the plural of last resort' (Ratcliff, 2008: 440).

[2] For details about the behaviour of dual and pseudo-dual in Jordanian Arabic, see Mashaqba, 2015: 195, fn. 78, 198).

[3] Plurals that do not end with either *-aat* or *-uun* (cf. Abd-Rabbo, 1990: 56).

[4] These modes of pluralization are also manifested in Ahl Al-Jabal dialect.

As the name suggests, SP is characterized by a suffix or more precisely by the lengthening of an existing suffix. The BP patterns are characterized by internal modification of the stem, i.e., syllable structure and vocalism (Ratcliffe, 2008: 439-440).[5] Phonologically, the SFP *-aat* 'involves lengthening of the feminine suffix vowel itself', *-at > -aat,* as in *ʤaamiʕat-*(*un*) 'university' *ʤaamiʕaat-*(*un*) (cf. McCarthy, 2008: 303; McCarus, 2008: 243 for Modern Standard Arabic (MSA)).

2. Literature Review

Sound feminine plural is among the most Arabic inflectional rules of a high degree of productivity as it can combine freely with almost all nouns and adjectives in the process of plural formation. The process of forming SPs involves a fairly simple suffixation; the SFP suffix *-aat* is also the default plural form for most foreign borrowings in all regional varieties (Wilmsen, 2007: 375).

Although the SP morphemes have gained some ground at the expense of BP patterns, SP receives little attention in the modern literature on CA, MSA, and modern Arabic dialects simply because it is rule-governed. In the literature, modern Arabic dialects have lost their declensional system: 'the sound plural is marked by the oblique ending *-iin* for masculine and *-aat* for feminine nouns' (Versteegh, 2004: 1749).

The inflectional morphology is predominantly concatenative in the morphological category of number for SP but non-concatenative for BP (Benmamoun et al., 2014: 94). In CA and MSA (e.g., Haywood & Nahmad, 1965; Abd-Rabbo, 1990; Holes, 2004; Ryding, 2005; Abu-Chacra, 2008, among others), and the great majority of Arabic vernaculars (e.g. Cowell, 1964 for Syrian Arabic, Watson, 2002 for Cairene Arabic, Abu-Haidar, 1991 for Christian Arabic of Baghdad, Mashaqba, 2015 for Wadi Ramm Arabic, Huneety, 2015 for Wadi Mousa Arabic, among others), SP employs suffixation of the masculine *-iin* (*-uun* for nominative case in CA and MSA) or feminine *-aat* to the nominal stem (nouns and adjectives), basically attested in derived nominals, namely: 'participles, nouns of profession, and relational nouns and adjectives' (cf. Abd-Rabbo, 1990: 56; Watson, 2002; Mashaqba, 2015).[6] The sound masculine plural suffix *-iin* is demonstrated where the referent is human male. The SFP pattern is 'less restricted in use than the sound masculine plural' (Mashaqba, 2015: 195-196); it can be affixed to deverbal derivatives as in (1a. and 1b.), loanwords (as in 1c.), singular nouns ending with a feminine ending *-ih, -i* (as in 1d.), non-human plural nouns (as in 1c. and 1d.), substantives that have female referents (as in 1e.),[7] or plurals of plurals (as in 1f.). (ibid: 195-198).

(1)   a. *mašġuul* 'busy' > *mašġuul-aat* 'busy f.p.'
          b. *saalim* 'being safe' > *saalm-aat* 'being safe f.p.'
          c. *talafoon* 'telephone' > *talafoon-aat* 'telephones'
          d. *maxaddih* 'pillow' > *maxadd-aat* 'pillows'
          e. *ʤaddah* 'grandmother' > *ʤadd-aat* 'grandmothers'
          f. *ʔayyaam* 'days' > *ʔayyaam-aat*   'days'

Sound feminine plurals are typically assigned to feminine adjectives marked by *-at,* as in *jaalis* 'sitting m.', *jaal*(*i*)*s-aat* 'sitting f.p.'. When adjectives serve an attribute or predicate to a dual/plural substantive, the feminine plural form is used, as in (2):

(2)   a. *binteen ḥašmaat* 'two pretty girls'
          b. *kabšeen/naʕ*(a)*ʤateen simiinaat* 'two fat rams/ewes'

For words which are 'defective' – lacking a third consonant in part of their paradigm – or which have become defective as a result of sound change, there is a synchronic tendency to realize as tri-consonantal root throughout the paradigm, e.g. *sama > samawaat* 'skies' from s-m-w.

In Semitic languages, the SFP is represented by two endings that do not constitute any distinguishing feature of the South Semitic languages. The most common and widely distributed ending, in Arabic as well as in South Semitic languages, is *-*(*aa*)*t* and its corresponding variants: in Epigraphic South Semitic languages *-*(V)*t*; in Geʕez, Tigrinya, Tigrè *-*(*aa*)*t/-*(*o*)*tat*; in Modern South Arabian languages *-*(V)*t/-*(V)*tə*(*n*); in the southern branch of the Ethio-Semitic languages (Amharic and others) *-očč/-*(*a*)*č/-ča* (Belova, 2009: 309). Although is rare, the SFP of the noun is attested in Thamudic[8] as in *dṣyt > daṣyaat* 'antelopes' (Knauf, 2009: 480).

In the modern Arabic vernaculars, the SFP is made by suffixing *-aat* to the feminine nouns or adjectives (cf. Cowell, 1964: 209-215 for Syrian Arabic, Khalafallah, 1969: 52 for Ṣaʕiidi Egyptian Colloquial Arabic, Holes, 1984: 25 for Colloquial Arabic of the Gulf and Saudi Arabia, Abu-Haidar, 1991: 74-75 for Christian Arabic of Baghdad, Watson, 2002: 164-6 and Watson, 2009: 113 for Ṣanʕaani Arabic, Al-Saqqaf, 2009: 691 for Waadi Ḥaḍramawt Arabic, Owens, 2009: 711 for West Sudanic Arabic, among others).

Most interestingly, Northern Najdi (the dialect of the Shammar tribe and the city of Ḥayil) marks *ʔimaala* of the feminine plural suffix, changing the final plural morpheme *-aat* into *-aay* (e.g., *banaat ṭabbaaxaat* 'girls cooking' > *banaay ṭabbaaxaay*) (Ingham, 2009: 126). This remarkable feature distinguishes Northern Najdi from the other local variety in Najd (Central Najd) as well as from other regional dialects in Saudi Arabia (namely the Ḥijaz, the Southwest, and the Eastern region). For more details, see Ingham (1971, 1986a, 1986b, 1994). The early Arabic grammarians refer

---

[5] Ratcliffe (1990, 1998) and Idrisse (1997) conclude that SPs are different from BPs not because one involves suffixation and the other is templatic, but because the former operates outside the stem whereas the latter operates within the stem.

[6] It is referred to as '-*aat* Plural' in Abd-Rabbo (1990: 56).

[7] A few substantives may relate different plural patterns as in: *naagah* 'camel' > *nuug ~ nyaag > naagaat* (cf. Mashaqba, 2015: 195-196).

[8] This language refers to epigraphically attested Ancient Arabic scripts and languages (Knauf, 2009: 477).

to this *ʔimaala* as a feature of the Ṭayyiʔ tribe, who inhabited the area of Jabal Ṭayy, now known as Jabal Shammar (Anis, 1995: 99,[9] Rabin, 1951: 206 cited in Ingham, 2009: 126).

In Nigerian Arabic, the past tense *-t* marking the first/second person masculine singular, is deleted word-finally after a consonant; thus, /taxallas-t/ 'finish-I' is pronounced *taxallas* (Owens, 1998: 22–26 cited in Hoberman, 2009: 118). The SFP in Maltese has 'withstood the test of time' and is being more preferred to BP (Mifsud, 2008: 154). Other than *-iin* and *-aat*, Jewish Baghdadi uses Hebrew suffixes *-iim* and *-ooṯ* with Hebrew words: *ḥxamim* 'rabbis', *braxooṯ* 'blessings' (Mansour, 2006: 237).

However, the morphological mapping of SFP in the dialect under investigation involves rather interesting phonological realizations which are different from other Jordanian Arabic dialects as well as the majority of regional Arabic dialects; where the predominant SFP ending in most Arabic dialects is *-aat*, it is ***aa***/***aa***h in Ahl Al-Jabal variety (see sections 4 and 5 below).

3. Material and Methodology

To examine SFP in Ahl Al-Jabal Arabic, the researchers recruited 24 ideal participants, 12 males and 12 females, who are natives of Ahl Al-Jabal Arabic, and who have spent all their life in Ahl Al-Jabal areas. The ages of participants range between 35-70 years old. Ahl Al-Jabal tribe consists of the following subtribes: Masaʕiid, ʕdumaat, Shurufaat and Zbaid. Six participants are chosen from each tribe to ensure the quality of data; Participants' level of education ranges from primary education (17 participants) to secondary education (7 participants). The researchers made sure that all these participants are healthy, have no speech impediments and are willing to answer all questions that serve this study.

Two methods are employed to examine SFP in the dialect under investigation. The first method involves recording conversations with 20 participants where researchers raise questions involving plural words. In the second method, a list of 80 singular words was prepared and given to all participants to use them in a sentence. All data were checked with two language consultants.

Section one of this study gives a brief overview of the background of the problem investigated; section two is devoted to review literature on plural system in Arabic. The methodology along with the research outline are presented in section three. Section four accounts for the results of the current study followed by a detailed discussion of the behaviour of SFP in Ahl-Al-Jabal dialect. Hereafter, acoustic analysis is given in section five in support of the examined material. Section six gives a summary of the results and offers suggestions for future studies.

4. Results and Discussion

This section examines cases where SFP takes place in Ahl Al-Jabal dialect. Drawing on Watson (2002), the data are followed by a feature geometric model in an attempt to explain ways of mapping each representation. Then, spectrographic representations are provided to give a visual explanation for the deletion of the voiceless plosive [t] where it is part of the SFP morpheme *-aat*, and how the [t] deletion is accompanied by a fricative noise pre-pausally.

Contrary to CA, MSA (e.g., Haywood & Nahmad, 1965; Abd-Rabbo, 1990; Holes, 2004; Ryding, 2005; Abu-Chacra, 2008), Jordanian Arabic dialects (e.g., Al-Wer, 2007 for Ammani Arabic, Mashaqba, 2015 for Wadi Ramm Arabic, Huneety, 2015 for Wadi Mousa Arabic), as well as most of the modern local and regional Arabic dialects (e.g., Cowell, 1964 for Syrian Arabic, Holes, 1984 for Colloquial Arabic of the Gulf and Saudi Arabia, Abu-Haidar, 1991 for Christian Arabic of Baghdad, Watson, 2002 for Cairene Arabic, Davey, 2013 for Coastal Dhofaarii Arabic), the SFP suffixation fails to surface as *-aat* in Ahl Al-Jabal dialect, the target of the present study. Most interestingly, this remarkable feature also distinguishes Ahl Al-Jabal dialect from Northern Najdi dialect which marks *ʔimaala* of the feminine plural suffix, changing the final plural morpheme *-aat* into *-aay* (e.g., *banaat ṭabbaaxaat* 'girls cooking' > *banaay ṭabbaax**aay***) (cf. Ingham, 2009: 126) (see also section one above).

Interestingly, final voiceless plosive *-t* deletion is clearly a lexical process as the final /t/ fails to elide if the word-final *-aat* does not mark SFP. The examples of final /t/ deletion in (3b) compare with those in (3a) where [t] does take place.

(3a)   *iybaat* 'he sleeps' > *iybaat*

       tagtaat 'she eats' > *tagtaat*

       tanšaat 'to be kicked' > *tanšaat*

       ṣaat 'to be known' > *ṣaat*

       maat 'to die' > *maat*

       ḏaat 'one' > *ḏaat*

       biḏḏaat 'exactly' > *biḏḏaat*

       sibaat 'sleep' > *sibaat*

(3b)   *bint* 'daughter' > *banaa* 'daughters'

       mʕallma 'teacher f.' > *mʕallmaa* 'teachers f.'

       farša 'matrix f.' > *faršaa* 'matrixes'

       šanta 'bag' > *šantaa* 'bags'

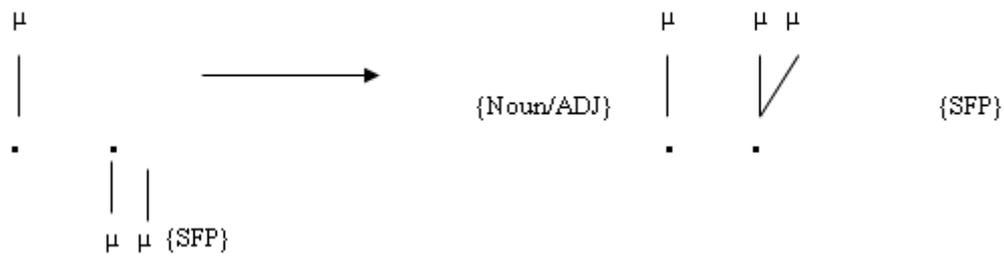   *sayyaara* 'car' > *sayyaaraa* 'cars'

Deletion of *-t* occurs within a morphological domain; Tier Conflation (TC) takes place prior to deletion since the plosive alveolar /t/ is linearly adjacent and visible to the long guttural [aa] of SFP in order to surface as *-aat*. On the

---

[9] Anis opposes others in this respect; he claims that this is not *ʔimaala*. Instead, it involves a final consonant elision.
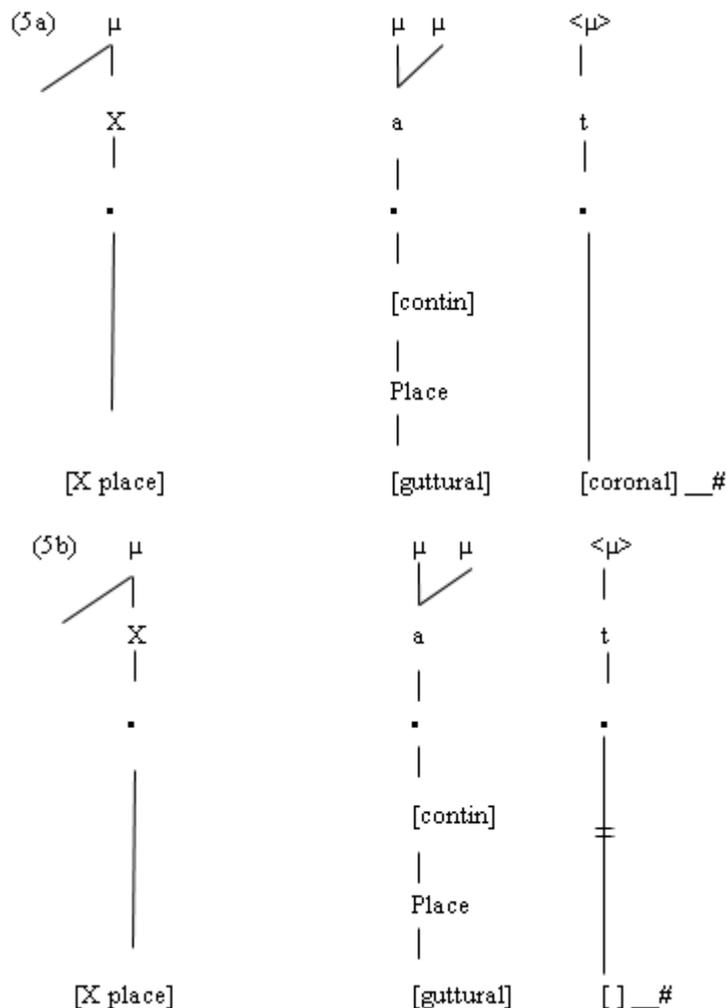
other hand, *-t* deletion occurs iff the neighbouring guttural [aa] is part of the SFP suffix *-aat*. This confirms that TC keeps the phonological information for morphemic distinction, whereas, morphological cue is erased. Therefore, association of the feminine suffix *-aat* to a preceding singular noun applies in two stages: (i), TC folds the morphemes nodes together in a linear configuration, as in (4) (after Watson, 2002: 232):

(4) Tier Conflation

{Noun/ADJ}

Stage (ii) involves deletion of the root node of the rightmost matrix (the matrix associated with /-aat/) motivated by specific morphological domain; consider data in (5a.) and (5b.). # marks word-finally in juncture position; {} marks pause (pre-pausal/utterance-final position).
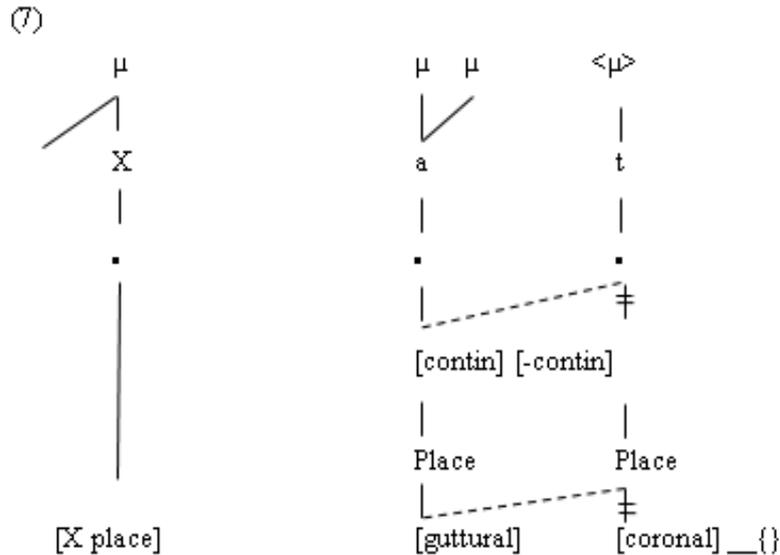

At this point, total erasure of part of the morpheme nodes takes place, where the output is not subject to post-lexical phonological representation as the erasure process does not violate extrametricality; thus the vacuum created by the deletion of the root node is left empty (see grid in 5b.). Notice that all elision examples do not involve any new resyllabication patterns.

Pre-pausally, the final voiceless plosive /t/ undergoes debuccalization by which it loses its original place of articulation [alveolar] and moves to the glottis to surface as [h], as in:

(6)   - *almʕallm-aat ġaaybaat > ammʕallmaa ġaaybaah* 'the teachers f. are absent'

         - *dʒann al-ban-aat > dʒann al-ban-aah* 'the girls came'

         - *šift sayyaar-aat ġaaly-aat > šift sayyaar-aa ġaaly-aah* 'I saw expensive cars'

This process would not be claimed to be aspiration since aspiration is a puff/ burst of air that accompanies voiceless plosives. At this point, the debuccalized consonant has been lenited to the point of clear elision. In other words, when

the singular noun/adjective ends with a final vowel, the attached SFP is realised by a pre-pausal glottalization, a glottal closure is noticed by the glottal fricative [h]. In such environment, association of the feminine suffix -*aat* to a preceding singular nominal stem similarly lies in two stages: (i) TC (as represented earlier in the grid in (4) above). Stage (ii) involves delinking of the root feature [-continuant] and the place feature [coronal] from the voiceless plosive /t/ and spreading of the root feature [continuant] and the place feature [guttural] from the guttural [aa]; the vacuum created by deletion of the root node is filled by the glottal fricative [h]; consider the grid in (7) below:

(7)

```
        μ                    μ   μ        <μ>

       /|                    \/ |          |
        X                    a   t
        |                    |   |
        .                    .   .
        |                    |_____‡
        |                    [contin] [-contin]
        |                     |          |
        |                    Place      Place
                             |_____‡
  [X place]               [guttural]   [coronal] __{}
```

The above grid confirms how the process of [h] production instead of /t/ would not be claimed to be aspiration. To argue how [h] production takes place in this environment, we claim that the effects of such an environment take place by spread of the stricture feature [continuant] and the place feature [guttural] from the [guttural] [continuant] vowel /aa/ and delinking of [-continuant] and [coronal], respectively.

At this point, one would recall that, in the literature, final positions may undergo phonological processes word-finally and utterance-finally (pre-pausal position), e.g., devoicing word-final voiced obstruents and pre-pausal glottalization of sonorants and voiced and emphatic obstruents in Ṣanʕaani Arabic (cf. Watson & Bellem, 2011, Bellem & Watson, 2014:169-170). However, the deletion of -*t* from the SFP -*aat* can be claimed to be a synchronic process in Ahl Al-Jabal dialect; this is evident from deletion of -t in recently adapted loan words in Ahl Al-Jabal dialect, as in (8):

(8)

talafoon	*talafoonaa*	'telephones'
mobayl	*mobaylaa*	'mobiles'
baaṣ	*baṣaa*	'buses'
baaloon	*baaloonaa*	'balloons'
kundišin	*kundišinaa*	'air conditions'
dišš	*diššaa*	'dishes'
kaboon	*kaboonaa*	'coupons'

Subsequently, one could predict the deletion of the final consonant /t/ as a mere morpho-phonological process (a helpful one, facilitating pronunciation, or an unfortunate one, obscuring the basic form of the suffix); on the other hand, others would prefer it as means of identifying the sound feminine suffix as opposed to other sequences. (See Hoberman, 2009: 115 for discussion on *sandhi*).

5. Acoustic Evidence

This section establishes further visual piece of evidence via spectrographic representations in support of the deletion of the voiceless plosive /t/ if and only if it is part of the SFP morpheme -*aat*. We can also prove how the /t/ deletion is accompanied by a fricative noise pre-pausally. To handle such significant morpho-phonological structures, we analyze examples from Ahl Al-Jabal dialect and another local Bedouin Jordanian dialect.

Figure (1) is a waveform and a spectrogram of the utterance [ammʕallm**aat** ġaayb**aat**] 'the teachers f. are absent' as produced by a female native speaker of Bani Hassan Bedouin (one of the Bedouin Jordanian dialects).
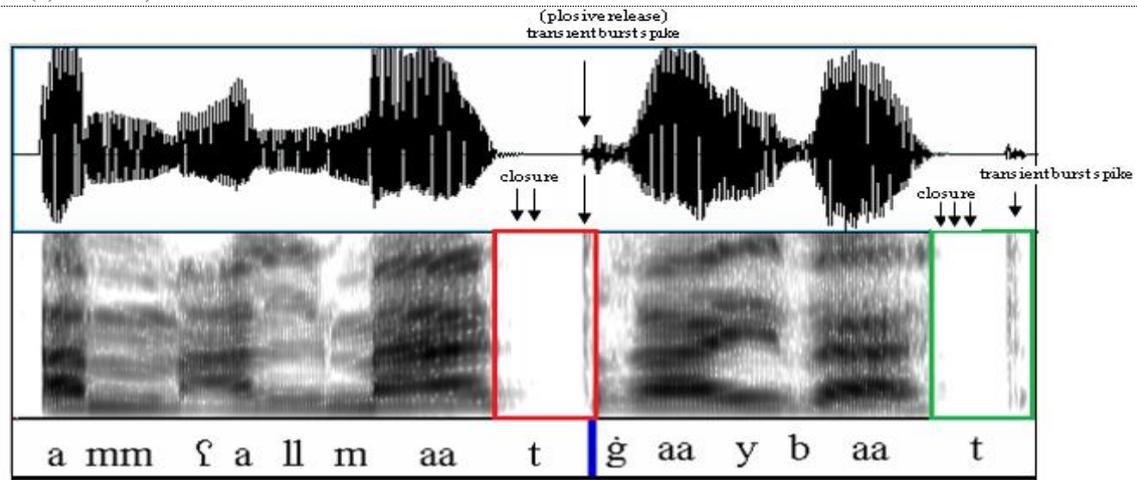
Figure 1. Waveform and spectrogram of [ammʕallmaat ġaaybaat] 'the teachers f. are absent' by a female native speaker of Bani Hassan Bedouin

Three acoustic properties characterize the Arabic voiceless plosive /t/ utterance-medially and pre-pausally: (i) closure and hold phases which can be seen as white blank, (ii) no voicing bar at the bottom of the spectrogram (at low frequency around 200 hz) denoting voicelessness, and (iii) the release (transient burst) which can be observed as a strong vertical spike. Consider Figure (1) where the red rectangular refers to the production of utterance-medial voiceless plosive [t], and the green rectangular which refers to a pre-pausal voiceless plosive [t].

In contrast with Figure (1), Figure (2) is a waveform and a spectrogram of the utterance [ammʕallm**aa** ġaayb**aah**] 'the teachers f. are absent', as produced by a female native speaker of Ahl Al-Jabal dialect.
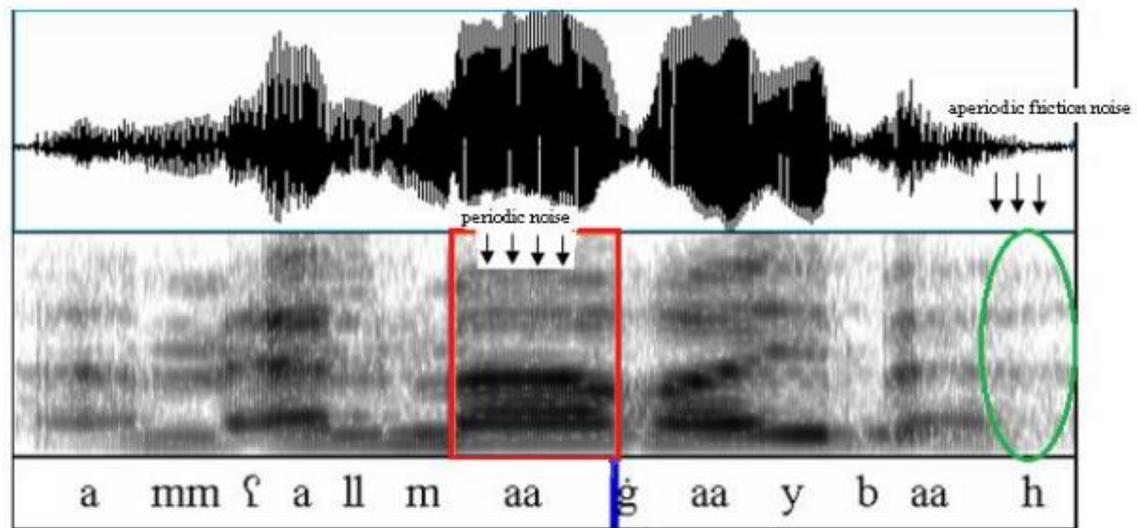

Figure 2. Waveform and spectrogram of [ammʕallmaa ġaaybaah] 'the teachers f. are absent', by a female native speaker of Ahl Al-Jabal dialect

The red rectangular denotes the long vowel [aa]. It can be represented as a periodic noise/signals which has two visual properties that mark voicing: clear defined dark formant bars and regular vertical striations along the production of the vowel. The long vowel [aa] is followed by an immediate transitional friction noise representing the consonant [ġ]. At this point, no any acoustic factors denote or represent any of the phases of the voiceless plosive [t]. The green oval also refers to the voiceless glottal fricative [h], where its production involves a lesser constriction in the glottis allowing friction noise to be produced. This can be seen on the spectrogram as a random noise and faint bands (very weak formants). In other words, the voiceless glottal fricative [h] production does not involve clear voicing bar, instead, it produces a weak voicing bar in contrast with those produced by vowels. The spectrograms give crystal clear evidence that [t] in the 'default' SFP suffix is deleted in Ahl Al-Jabal dialect, and is further compensated by the voiceless glottal fricative [h] only in pre-pausal position.

6. Conclusion

To test language loss/change in the area of morphology, SFP formation is elaborated as attested in Ahl Al-Jabal dialect. Plural formation in Ahl Al-Jabal Arabic is a rather interesting area of morphology, especially when compared with the morphology of plural in other Jordanian Arabic dialects as well as in many regional Arabic dialects. It shows synchronic innovations in nominal morphology; thus, where the predominant SFP ending in most modern Arabic

dialects is -*aat*, it is *aa*/*aah* in Ahl Al-Jabal variety.

This paper presents data showing that the same singular nominal base derives two different SFP forms in different dialectal varieties in Jordan. The work is also of serious importance to the morphophonological theories as it emphasises the weight of how a purely phonological structure/output is significantly visible to morphological constraints.

Finally, further work should be carried out on other morphophonological aspects to be attested in the Ahl Al-Jabal dialect, such as the deletion of the first person singular pronominal suffix word-finally.

References

Abboud, P. et al. (1984). *Elementary Modern Standard Arabic I.* Cambridge: Cambridge University Press.

Abd-Rabbo, M. Z. (1990). Sound plural and broken plural assignment in Classical Arabic. *Perspectives on Arabic Linguistics* I, 55-94.

Abu-Chacra, F. (2008). *Arabic: An essential grammar*. London, New York: Routledge.

Abu-Haidar, F. (1991). *Christian Arabic of Baghdad*. Otto Harrassowitz Verlag: Wiesbaden.

Al-Saqqaf, A. H. (2009). Waadi Ḥaḍarmawt Arabic. In Versteegh, Kees, et al. (eds.). *Encyclopedia of Arabic Language and Linguistics* IV, Leiden – Boston – Cologne: Brill, 687-698.

Al-Wer, E. (2007). Jordanian Arabic (Amman). In Versteegh, Kees, et al. (eds.). *Encyclopedia of Arabic Language and Linguistics* IV, Leiden – Boston – Cologne: Brill, 505-517.

Anis, I. (1995). *Fi-l-lahǧaat il-ʕarabiyya*. (2nd ed). Cairo: Maktabat al-Anglu Al-Masriyya.

Bellem, A. & Watson, J. C. E. (2014). Backing and glottalization in three SWAP language varieties. *Journal of Semitic Studie*s 34 (Supplement: Arabic and Arabic Linguistics: Traditional and New Theoretical Approaches): 169-207.

Belova, A, G. (2009). South Semitic languages. In Versteegh, Kees, et al. (eds.). *Encyclopedia of Arabic Language and Linguistics* IV, Leiden – Boston – Cologne: Brill, 300-315.

Benmamoun, E. et al. (2014). Arabic plurals and toot and pattern morphology in Palestinian and Egyptian heritage speakers. *Linguistic Approaches to Bilingualism*, 4(1), 89-123.

Cowell, M. W. (1964). *A reference grammar of Syrian Arabic*. Washington: Georgetown University Press.

Davey, R. (2013). *Coastal Dhofaarii Arabic: A sketch grammar*. PhD Thesis. University of Manchester. UK.

Haywood, J. A., & Nahmad, H. M. (1965). *A new Arabic grammar of the written language*. London: Lund, Humphries.

Hoberman, R. (2009). Sandhi. In Versteegh, Kees, et al. (eds.). *Encyclopedia of Arabic Language and Linguistics* IV, Leiden – Boston – Cologne: Brill, 115-118.

Holes, C. (1984). *Colloquial Arabic of the Gulf and Saudi Arabia*. London; Boston: Routledge & Kegan Paul.

Holes, C. (2004). *Modern Arabic: Structures, functions, and varieties*. Washington, DC: Georgetown University Press.

Huneety, A. (2015). *Phonology and morphology of Wadi Mousa Arabic*. PhD Thesis. University of Salford. UK.

Idrisse, A. (1997). Plural formation in Arabic. In: Eid, Mushira et al. (eds). *Perspectives on Arabic Language and Linguistics* X, 123-146. John Benjamins Publishing: Amsterdam/Philadelphia.

Ingham, B. (1971). Some characteristics of Meccan speech. *Bulletin of the School of Oriental and African Studies* 34, 273–297.

Ingham, B. (1986a). Notes on the dialect of the Al Murrah of Eastern and Southern Arabia. *Bulletin of the School of Oriental and African Studies* 49, 271–291.

Ingham, B. (1986b). *Bedouin of Northern Arabia: Traditions of the Al-Dhafir*. London and New York: Routledge and Kegan Paul.

Ingham, B. (1994). *Najdi Arabic: Central Arabian*. Amsterdam and Philadelphia: J. Benjamins.

Ingham, B. (2009). Saudi Arabia. In Versteegh, Kees, et al. (eds.). *Encyclopedia of Arabic Language and Linguistics* IV, Leiden – Boston – Cologne: Brill, 122-130.

Khalafallah, A. (1969). *A descriptive grammar of Ṣaʕiidi Egyptian colloquial Arabic*. Mouton: The Hogue.

Knauf, E. A. (2009). Thamudic. In Versteegh, Kees, et al. (eds.). *Encyclopedia of Arabic Language and Linguistics* IV, Leiden – Boston – Cologne: Brill, 477-483.

Levy, M. N. (1971). *The plural of the noun in Modern Standard Arabic*. Ph.D. dissertation, University of Michigan.

Mashaqba, B. (2015). *Phonology and morphology of Wadi Ramm Arabic*. PhD Thesis. University of Salford. UK.

Mansour, J. (2006). Baghdad Arabic Jewish. In Versteegh, Kees, et al. (eds.). *Encyclopedia of Arabic Language and Linguistics* I, Leiden – Boston – Cologne: Brill, 231-241.

McCarthy, J. (2008). Morphology. In Versteegh, Kees, et al. (eds.). *Encyclopedia of Arabic Language and Linguistics* III, Leiden – Boston – Cologne: Brill, 297- 307.

McCarus, E. N. (2008). Modern Standard Arabic. In Versteegh, Kees, et al. (eds.). *Encyclopedia of Arabic Language and Linguistics* III, Leiden – Boston – Cologne: Brill, 238- 262.

Mifsud, M. (2008). Maltese. In Versteegh, Kees, et al. (eds.). *Encyclopedia of Arabic Language and Linguistics* III, Leiden – Boston – Cologne: Brill, 154-159.

Owens, J. (1998). *Neighborhood and ancestry: Variation in the spoken Arabic of Maiduguri, Nigeria*. Amsterdam and Philadelphia: J. Benjamins Publishing.

Owens, J. (2009). West Sudanic Arabic. In Versteegh, Kees, et al. (eds.). *Encyclopedia of Arabic Language and Linguistics* IV, Leiden – Boston – Cologne: Brill, 708-718.

Rabin, C. (1951). *Ancient West-Arabian*. London: Taylor's Foreign Press.

Ratcliffe, R. (1990). Arabic broken plurals: Arguments for a two-fold classification of morphology'. In Eid, M., McCarthy, J. *Perspectives on Arabic Linguistics* II 2nd annual symposium on Arabic. Amsterdam: John Benjamins, 94-119.

Ratcliffe, R. (1998). *The 'broken' plural problem in Arabic and comparative Semitic: Allomorphy and analogy in non-concatenative morphology*. Amsterdam and Philadelphia: J. Benjamins.

Ratcliffe, R. (2008). Number. In Versteegh, Kees, et al. (eds.). *Encyclopedia of Arabic Language and Linguistics* III, Leiden – Boston – Cologne: Brill, 439-477.

Ryding, K. (2005). *A reference grammar of Modern Standard Arabic*. Cambridge: Cambridge University Press.

Sakarna, A. K. (2013). A proposed model of Optimality Theory for Jordanian Arabic broken plurals. *English Language Teaching*, 6(1), 48.

Versteegh, K. (2004). From Classical Arabic to the Modern Arabic vernaculars. In: Booij, Geert, et al. (eds). *Morphology: An International Handbook on Inflection and Word-Formation* II, 1741-1754.

Watson, J. C. E. (2002). *Phonology and morphology of Arabic (the phonology of the world's languages)*. USA: Oxford University Press.

Watson, J. C. E. (2009). Ṣanʕaani Arabic. In Versteegh, Kees, et al. (eds.). *Encyclopedia of Arabic Language and Linguistics* IV, Leiden – Boston – Cologne: Brill, 106-115.

Watson, J. C. E & Bellem, A. (2011). Glottalisation and neutralisation in Yemeni Arabic and Mehri. In: Hassan, Zeki & Heselwood, Barry (eds.). *Instrumental Studies in Arabic Phonetics. Amsterdam*: John Benjamins. 235-256.

Weninger, S. (2011) Reconstructive morphology. In: Stefan Weninger, et al. (eds). *The Semitic Languages: An International Handbook* 1, 151-178.

Wilmsen, D. (2007). Interference. In Versteegh, Kees, et al. (eds.). *Encyclopedia of Arabic Language and Linguistics* II, Leiden – Boston – Cologne: Brill, 373-378.