

Liaison in Jordanian Arabic and Standard Arabic: Syntax-Prosody Interface

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Abstract

Liaison in Arabic applies to words that end with the feminine marker /t/ even in masculine nouns and adjectives when they happen to have the feminine ending. In this paper, we study liaison in Jordanian Arabic (JA) and Standard Arabic (SA) from the standpoint of syntax-prosody interface. We study the mapping of syntactic phrases onto phonological ones when this process takes place. We argue that liaison in JA is syntactically governed; it occurs only in construct state nominals (CSNs). We compare our finding in JA to those of Standard Arabic (SA). We also present evidence that JA marks right edges of phonological phrase in this phrase-level phonological process. We account for the differences between CSNs, where liaison applies, and other noun phrases where it does not. Finally, we discuss liaison with enchainement which occurs when the second word of the construct state begins with the definite article *æl*.

Keywords: Arabic, Syntax-prosody interface, Edge marking, Construct state nominals, Liaison

1. Introduction

Arabic is characterized by a number of distinctive phonological phenomena that enable speakers to pronounce sounds easily and move across words smoothly. Sandhi, which involves various phonological mechanisms of deletion, insertion, assimilation, liaison and deglottalization (Anderson 1986), is one of the most commonly-used phonological processes in Arabic that makes the speaker's task easier. In some cases, sandhi results in enchainement whereby a word-final consonant is realized as the onset of the following syllable¹. In this paper, we study the conditions where liaison with and without enchainement applies and how the syntactic phrases map onto the phonological ones.

Many studies have addressed liaison across word boundaries (e.g. Morin and Kaye 1982, De Jong 1990, Moisset 2000, Post 2000, Bybee 2001, Tseng 2002, Féry 2003). It is ascertained in these studies that liaison is affected by prosodic, morphological and syntactic factors. With regard to Arabic, some studies have discussed this phenomenon in Standard Arabic from syntactic or morphological standpoints (see Benmamoun 1998, Mohammad 1999, and Abdel-Ghani 2010).

The significance of this study lies in two points: it approaches a boundary phonological process in Arabic from a syntactic-prosodic angle. In addition, rather than focusing only on SA, it discusses this process in one of the Arabic dialects, JA, and compares and contrasts it to SA.

The paper proceeds as follows: in section 2 we review some literature about liaison. In section 3 we discuss liaison in JA and SA. In section 4, we apply XP Edge Marking to JA and Modern Standard Arabic. Section 5 demonstrates the differences between CSN Structures and Noun-Adjective NPs. Liaison with Enchainement is addressed in section 6. Section 7 concludes.

2. Literature Review

Selkirk (1974:576-577) states that "phonological rules operating beyond the level of the word are restricted to particular phrase structure environments..... This is true of external sandhi rules, which are local in character operating only on the adjacent segments of two consecutive words. *The sandhi rules do not apply unless the words under question are in a particular syntactic environment.*" To prove her theory, Selkirk brings evidence from liaison which she defines as the maintaining of a final consonant because of an initial vowel in the following word (ibid: 580). Selkirk presents ample evidence that liaison applies only in an X-Comp context; between a head and its complement. We will show that JA also restricts the liaison rule to, more or less, the same environment.

Generally, liaison may occur in certain syntactic structures at word boundaries without enchainement, i.e the consonant sound at the end of a word is not transferred to the beginning of the word that follows. It may also occur across word boundaries accompanied with

¹ Enchainement creates a problem for the listeners particularly if they are non-native speakers since they may find it difficult to break apart the chunk they hear into distinct words.

resyllabification and enchainement since the final consonant of the first word is realized as the onset of the first syllable in the second word². Encrevé and Scheer (2005) consider liaison consonants as floating sounds on the segmental and syllabic tiers. Liaison can, then, amount to pronouncing a null phonetic element when it is followed by certain sounds such as vowels³. The plural marker in French, for example, is only pronounced and realized as syllable-onset consonant of the following word when that word begins with a vowel.⁴ Compare (1a) where liaison applies to (1b) where it does not. The symbol '∧' linking the words indicates that the final consonant /s/ of the definite article *les* is pronounced and the symbol '/' indicates that it is not.

- (1) a. les ∧ amis 'the friends'
 b. les / garçons 'the boys'

The domain of liaison, in languages which exhibit it, has been analyzed as a phonological phrase (PPh), which is a prosodic domain indirectly defined in syntactic terms. Post (2000), and Brown and Jun (2003) found that the domain of liaison in French matches an accentual phrase, which amounts to a Minor Phrase (MiP), the prosodic phrase which directly dominates the prosodic word (Richards 2010). In Arabic, *MiP* is composed of two words in most cases (Hellmuth 2004, 2007, 2011). We will show that liaison in JA applies only to a CSN which is equal to a *MiP* since it is mostly composed of two words.

Finally, it is worth mentioning that liaison is not a purely phonological phenomenon since the factors which trigger it cannot always be identified based on their phonology (see Selkirk 1986, Siloni 2003, Tseng 2003). In addition, liaison is not inevitably realized at every word boundary where it is phonologically possible. It is subject to a variety of lexical, syntactic, phonological and other conditions.

3. Liaison in Arabic

In this section, we discuss liaison, with and without enchainement, and shed light on the mapping of syntactic structure onto prosodic phrases when liaison applies. We argue that liaison occurs in certain syntactic contexts. Further, we show how liaison aligns syntactic phrase edges with phonological ones.

3.1 T-Consonant Liaison

Liaison is realized in Arabic in the feminine marker '*ta:ʔ marbu:Tah*', referred to as the

² This results in a mismatch between prosodic word and phonological phrase boundaries.

³ Some studies consider liaison as a process of final consonant deletion (e.g. Schane 1968). Others have analyzed it as an insertion process (e.g. Tranel 1995). However, we are not going to pursue this issue in the paper. We will basically assume that it is a deletion process as will be shown in the equation in (7) and the rule in (12).

⁴Liaison is impossible in certain syntactic environments. In others, it is obligatory. Still, it is optional in some other environments. For instance, French liaison is less frequent between nouns and postnominal adjectives and forbidden between two postnominal adjectives (Pak 2006).

Nevertheless, it is not the case that the word with the feminine marker is in liaison context with just any other item that happens to follow it:

- (4) a. /madrasa-t kbi:ra-t/¹⁰
 [madrasa kbi:ra]
 school-F big-F
 'A big school'
- b. /æel-madrasa-t æilli fi: waṣṣaḏ æel-balad kbi:rat/
 [æelmadrasaæjllj.....]
 the-school-F that in middle the-town big
 'The school, which is downtown, is big.'
- c. /æel-madrasa-t b-ti-ftaH badri/
 [æelmadrasa btjftaʔ.....]
 the-school-F ASP-IMPF-open early
 'The school opens early.'
- d. /æel-madrasa-t kbi:ra-t/
 [æelmadrasa kbi:ra]
 the-school-F big-F
 'The school is big.'
- e. /æel-madrasa-t fi: waSaT l-balad/
 [æelmadrasa fi: waSaT....]
 the-school-F in middle-the-town
 'The school is downtown.'

Although *madraset* 'school' is followed by some other material in (3) and (4a-e), *t* is not pronounced in the latter cases¹¹. In (3), the two words are in X-Comp relation since the following material *xawla* 'proper name' is a complement to *madraset* and the whole phrase is a Construct State Nominal CSN¹². N2 in CSNs is a complement to the head N1 as evident

¹⁰Most Jordanians say *kbi:re* with a CC cluster in the onset though some would typically say *kabi:re* with a CVC as in Standard Arabic (SA) which does not tolerate complex onsets.

¹¹Throughout the paper, the feminine marker will be written as *t* even if it is not pronounced, and it will appear in bold when pronounced as in (3) above.

¹² CSN is used here to refer to examples like (3a&b), i.e. when N1 is followed by an N2 or when it is followed by a clitic possessor. Liaison can also appear in the context of non-nominal heads such as adjectives as long as they form a construct state with the following word:

- Lina baarida-t l-□a□Saab
 Lina calm-f the-nerve-pl
 'Lina has cold nerves'

from the following tests (based on Radford 2004, Haegeman and Gueron 2005, Hornstein, Nunes and Grohmann, 2005, Carnie 2008, among others):

- (5) a. Complements are closer to heads than adjuncts; therefore, the complement *tenis* 'tennis' in (5a.i) must be closer to the head *maDrab* than the adjunct *dʒdi:d* 'new'. This accounts for the ungrammaticality of (5a.ii).

i. Rami æjǽtara maDrab [tenjs] [dʒdi:d]

Rami buy:PRF:3SM racket tennis new

'Rami bought a new tennis racket.'

ii. *Rami æjǽtara maDrab [dʒdi:d] [tenjs]

Rami buy:PRF:3SM racket new tennis

'Rami bought a new tennis racket.'

- b. Adjuncts are iterative whereas complements apply only once in an XP. This explains the acceptability of two adjuncts in (5b.i), but not two complements in (5b.ii).

i. Rami æjǽtara maDrab tenjs [amri:ki] [dʒdi:d]

Rami buy:PRF:3SM racket tennis American new

'Rami bought a new American tennis racket.'

ii. *Rami æjǽtara maDrab [tenjs] [sqwaǽ]

Rami buy:PRF:3SM racket tennis squash

'Rami bought a tennis squash racket.'

- c. - Adjuncts can conjoin with other adjuncts as in (5c.i); complements can conjoin with other complements as in (5c.ii). However, adjuncts cannot conjoin with complements (5c.iii).

i. Rami æjǽtara maDrab tenjs [dʒdi:d] w [ghali]

Rami buy:PRF:3SM racket tennis new and expensive

'Rami bought a new and expensive tennis racket.'

ii. Rami æjǽtara maDrab [tenjs] w [sqwash]

Rami buy:PRF:3SM racket tennis and squash

'Rami bought a tennis racket and a squash racket.'

iii. * Rami æjǽtara maDrab [tenjs] w [ghali]

Rami buy:PRF:3SM racket tennis and expensive

'Rami bought an expensive and tennis racket.'

replaced by a glottal fricative h (Watson 2002:188). The reason is that case markings are retained except on prepausal words where they are dropped. Thus, t-liaison applies in SA in all environments as long as the speaker does not drop case suffixes, irrespective of whether the following material was a complement, an adjunct or even a different XP since all the inflectional endings in nonpausal positions must be pronounced, and it is impossible to pronounce an NP's case inflection without pronouncing the feminine suffix, which is introduced in the previous layer of the morphological derivation as the SA examples below show:

- (8) a. /*ʃarjka-t-u* *æumnjya-t/*
 [*ʃarjkatu* *æumnjjah*] *CSN*
 company-F-NOM Umniya-F
 'Umniya company'
- b. /*æaǎ-ʃarjka-t-u* *æal-muttaujda-t-u/*
 [*æaǎ-ʃarjkatu* *æal-muttaujdah*] *NP N+adj*
 The-company-F-NOM united-F- NOM
 'The united company'
- c. /*æaǎ-ʃarjka-t-u* *nadʒaHa-t/*
 [*æaǎ-ʃarjkatu* *nadʒaHat*] *NP VP*
 the-company-F-NOM succeed:PRF-3SF
 'The company was a success.'

Note that in (8a-b) the first feminine *t* in *ʃarjkat* 'company' is pronounced since it is followed by some other material and thus the CASE suffix is not dropped, whereas the second *t* in *ʔumnjat* 'Umniya' (8a) and *muttaHdat* 'united' (8b) is not pronounced because it is not followed by any material, or more precisely because they are in a prepausal position where the inflectional suffix is dropped. Consequently, the last syllable, which encompasses the feminine marker and the inflectional suffix, is omitted as well.

Sometimes, Modern Standard Arabic (MSA) speakers opt for dropping the inflectional suffix. In this case, the feminine marker is dropped in all contexts and is turned into a glottal fricative [h], except in CSNs just as in JA:

- (9) /*æaǎ-ʃarjka-t-u* *æal-muttaHjda-t-u* *baʔi:da-t-u* *æal-æufuq/*
 [*æaǎ-ʃarjkaḥ* *æal-muttaHjdah* *baʔi:da* *tul* *æufuq*]
 the-company-F-NOM the-united-F-NOM far-F-NOM the-horizon/
 'The united company has a wide horizon.'

and Prince 1993, Selkirk 2001). *T*-liaison thus applies in nonfinal position of a *p*-phrase rather than in nonfinal position of an XP as shown in the prosodic representation (second line) in (11). *T*-liaison, in JA and in MSA, when CASE suffixes are dropped, can then be formulated as:

- (12) *T*-consonant liaison: the feminine suffix is pronounced except in the prosodic word immediately preceding the right edge of a *p*-phrase.

Thus, the fact that *t*-liaison does not apply to *madrasat* in (4a-b) is evidence for the presence of an immediately following *p*-boundary. Likewise, the fact that *t*-liaison does apply to the word *madrasat* in (3) is evidence that this word is not immediately followed by a *p*-boundary.

5. CS Structure and Noun-Adjective NPs

Watson (2002:189) points out that the ending *-a* in Cairene Arabic (CaA) (and in many other dialects), and *-ih* in San'ani (SanA), which predominantly denotes feminine singular in nouns and adjectives, has two allomorphs: /it/ (CaA) and /at/ (SanA) in the construct state and /a/ (CaA) and /ih/ (SanA) elsewhere. The second element in the genitive construct may be either noun (as in 3a) or a possessive pronoun suffix (as in 3b). The non-pausal /t/ allomorph is restricted in almost all dialects of Arabic to the construct state before the dual ending, as in *fadʒara-t-ein* 'two trees'. A question arises here: what is there in a construct state that makes it behave differently? We will tackle this issue prosodically first, and syntactically second.

Let's take the CSN *madrasat Xawla* 'Xawla's school' in (3a) and the [_{NP}N+Adj] *madrasat kbi:rat* 'big school' in (4a). Both are projected under one maximal projection (NP) as shown in (6a-b) and thus could be thought of as one *p*-phrase. If so, *t*-liaison rule must apply to both NPs. However, the rule only applies to the CSN. First, many studies have pointed out that the Semitic N1+N2 construction in CSN obligatorily constitutes one prosodic unit with no break intervening between the two nouns (Ibn Al-Anbary (1961), Hablas (1993), Mohammed (1999), Silon (2003), Abdel-Ghani (2010). Gray (1934:77) observes that the first noun in a construct state nominal loses its own accent and becomes a proclitic, which has only a secondary accent. Therefore, the head of the construct (N1) does not bear main stress. Main stress thus shifts and falls on the nonhead member. Selkirk (1986) captures the same view by pinpointing that prosodically the head of the construct does not constitute a prosodic word in itself as it lacks main stress. Rather, it is part of the subsequent word. In other words, it forms a prosodic word with the head of the genitive member (N2). Thus, we have a prosodic word containing the head of the construct and the head of its genitive member. By the same token, Siloni (2003) argues that the particular properties of constructs are derived from their prosodic structure. Siloni pinpoints that the head of the construct is a lexical word which shows phonological properties typical of function words: it is a stressless reduced form. She adds that prosodic words are aligned with right edges of lexical words.

The prosodic difference between the NP in (3a) and that in (4a), in fact, supports Watson & Gibson's Argument/Adjunct Hypothesis (2004): the semantic closeness can be captured by using the argument/ adjunct distinction such that intonational boundaries are more likely to occur before adjuncts than before arguments. In our case, they are more likely to occur before

the adjunct *kbi:rah* 'big' than before the complement *xawla*. In other words, the prosodic relationship between N1 and N2 in CSNs is different from that of a head noun and an adjective. The combination of N1 and N2 in CSNs (referred to as *muDaaf* and *muDaaf ʔilayh* in Arabic) do form one utterance as if they were one prosodic word.

Based on his definition of Break Index¹⁴ BI-1, which occurs internal to compounds and construct state nominals, Shaked (2007) expects a CSN to be treated as a single PWd in Hebrew. Applying Tone Break Index (ToBI) to Standard Arabic CSNs, Abdel-Ghani (2010) concluded that liaison creates an absence of any prosodic boundary between N1 and N2. Consequently, she suggested that CSNs in Arabic be given the Break Index 0-1 (BI0-1), which represents a high degree of close cohesion between words. Using also the Break Indices, Hellmuth (2011) found that in a 3-word subject sentences, the MiP boundary was always found between the complement NP [N2] and the adjunct.

Traditional Arab linguists (e.g. Al-Andalusi 1998) stated that the canonical word order requires that the *muDaaf* and the *muDaaf ʔilayh* [_{CS} N1+N2]) are inseparable, unless necessary, since the *muDaaf ʔilayh* (N2) complements the *muDaaf* (N1) on a par with the indefinite marker *tanwi:n*, which is added as a suffix to the noun.¹⁵

Second, whereas the adjective in [_{NP} N+adj] in (4a) is an adjunct, N2 in CSNs in (3) is a complement to the head N1 as we have shown in (5) above. Thus, CSNs function as one syntactic unit. In this sense it is, more or less, like a compound word: since semantically it has a single referent, the parts of CSNs cannot be separated nor can any part be replaced separately. Borer (1996) pinpoints that CSNs are the result of syntactic incorporation of the head of the supporter (N2) into the head of the construct (N1). The incorporation here is required by the insertion of a head noun lacking a definiteness specification. Such specification can only be provided by the genitive member of the construct through the incorporation of its head with the underspecified head of the construct. Thus, a CSN is preferably analyzed as a single morphosyntactic word which constitutes a lexical XP projection (Shlonsky 1990, and Borer 1996).

The [_{NP} N+adj], on the other hand, can be split in many contexts since it is semantically complex and none of the two parts lack a specification that must be provided by the other. In addition, the meaning is usually easily comprehended when the noun is separated from the adjective by some intervening material:¹⁶ By contrast, adjacency must be observed in CSNs:

- (13) a. * Beit wa-llah ūumar [_{NP} N1+N2]_{CS}
 house I-swear Omar

¹⁴ Tone and Break Indices (ToBI) is a transcription system with a scale from 0-4 that aims at defining types of junctures.

¹⁵ *Tanwi:n* is the CASE suffix that appears on indefinite nouns in Arabic. It appears as *-un* in NOM, *-an* in ACC, and *-in* in GEN. However, in the case of *iDaafah* (CS), *tanwi:n* is dropped since the *muDaaf ʔilayh* (N2) results in having a definite NP.

¹⁶ Generally speaking, Arabic tolerates splitting the components of phrases and even splitting predicates and their arguments as long as meaning is preserved

'(It is) Omar's house, I swear.'

b. Beit wa-llah kbi:r [NP N+adj]

house I-swear big

'(It is) a big house, I swear.'

6. Liaison with Enchainement

T-liaison can be accompanied by enchainement if the word with the feminine suffix is followed by a word that starts with 'connective glottal stop of the definite article *ʔel*. In such a case, the feminine suffix is resyllabified as the onset of the syllable of enchainement: *Hamzatu l-waSl* undergoes deletion and the *l-* of the definite article becomes the coda of that syllable:

- (14) /madrasa-t æel-ɸurrjyya-t/ →
 [mad.ras.tel-Hur.rjy.ya] **JA**
 school-F the- Hurriyya-F
 'Al-Hurriyya School'

In addition, liaison with enchainement may be accompanied by stress shift. In the previous example, the main stress in *madrasat* 'school', on its own, falls on the heavy antepenultimate syllable *mad* since the penultimate is light. After enchainement, by contrast, it falls on the penultimate syllable, which turns heavy. Nonetheless, the phrasal stress falls on N2 as mentioned earlier:

- (15) a. x x x
 mad ra sa
 x
 x x
 b. x x x x x x
 mad ras tel Hur rjy yah]¹⁷

Finally, note that the prosodic process of liaison occurs only between words that form an XP (CSN) whether the first word was a noun or an adjective. By contrast, when the first word which has *ta:ʔ marbu:Tah*, is followed by a certain word but in different syntactic structure, liaison is blocked. In both (16a-b) below, *madrasat* 'school' is followed by *Xawla* 'a proper name'. *T*-liaison applies in (16a) since *Xawla* is a supporter (N2) of the CSN, but it does not

¹⁷ Although there is a stress shift in the first word, the main stress of the whole (CS) phrase falls on N2 since the head of CS (i.e N1) shows phonological properties typical of function words as proposed by Selkirk (1986) and Siloni (2003).

apply in (16b) because *madrāsāt* and *Xawla* do not belong to one XP.

(16)a. [NP [N₁ *madrāsa-t*] [N₂ *Xawla*]]

[*madrāsāt xawla*] **CSN**

school-F *Xawla*

'*Xawla's school*'

b. [NP *Haḍi madrāsāt*] [TP *Xawla bj-t-ujb-ha*]

[*haḍi madrāsa xawla bjtujbha*]

this school *Xawla* ASP-IMP:3SF-like-it:F **FOCUS structure**

'This is a school, *Xawla* likes it.'

Our findings of *t*-liaison support Selkirk's findings of French liaison (1974) that phonology provides evidence for an abstract hypothesis of syntactic configuration. Specifically, Selkirk proposes that an inflected head noun, adjective, or verb may be in a liaison context with the word that follows, if that word is in its complement, (i.e. a sister to the head N, Adj, V). In syntactic terms, a liaison context exists between an inflected X and its complement, which are both dominated by the same X'. We have shown that liaison in JA applies only in CSNs, that is between the head N₁ or Adj and its complement N₂.

7. Conclusion

This paper tackled liaison in JA with some reference to SA. We proposed that *t*-consonantal liaison applies only to CSNs, which amount to *Minor Phrases*. The fact that *t*-consonantal liaison occurs only in the syntactic structure of CSNs provides strong evidence for syntax-prosody interface in Arabic. Moreover, it was shown that *t*-consonantal liaison marks right edges of *Minor Phrases* since it is pronounced except in the prosodic word immediately preceding the right edge of a *p*-phrase. We also showed that liaison could be accompanied by enchainement when the second word begins with the definite article *ʔal*.

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