

Stress Assignment in N+N Combinations in Arabic

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Abstract

The validity of stress as a criterion to distinguish between compounds and phrases has been investigated in many languages, including English (see e.g. Lieber 2005: 376; Booij 2012: 84). However, the possibility of using stress as a criterion in this way has not been investigated for Arabic. Siloni (1997: 21) claims that in N+N combinations in Semitic languages, stress always falls on the second element. However, the results of a study using PRAAT reveal that, in Modern Standard Arabic (MSA) and Jordanian Arabic (JA), stress plays no role in distinguishing between various N+N combinations, i.e. compounds and phrases, e.g. *'muʕallim lfiizyaaʕ* 'the physics teacher' vs. *'bayt lwalad* 'the boy's house', respectively. Analysis shows that the default position of stress in N+N combinations in MSA and JA is on the first element. There is only one systematic exception, which is phonetically conditioned: in N+N combinations with assimilated geminates on the word boundary, a secondary stress or perhaps double stress is assigned.

Keywords: stress, Arabic, State Construct (SC), Synthetic Genitive Construction (SGC), phrases, compounds

1. Introduction

Stress has been the focus of a great deal of research in the last two decades, since it has been considered a useful criterion for distinguishing phrases from compounds in several languages (e.g. Chomsky and Halle 1968 (English); Bauer 2009: 402 (Danish); Don 2009: 379-380 (Dutch); Kiefer 2009: 531 (Hungarian); Szymanek 2009: 472-73 (Polish); Zamponi 2009: 587, 592 (Maipure-Yavitero) among others). In English, the idea that left-hand stress is often a mark of compounds, whereas right-hand stress is a sign of phrases was discussed by Chomsky and Halle (1968: 17). For instance, *'blackboard* is considered a compound, while *black 'board* is a phrase (Booij 2012: 84). If the stress of *blackboard* falls on the initial word, as in /'blæk,bɔ:(r)d/, it denotes 'a large black or green surface which is fixed to a classroom wall for writing'. On the other hand, if the stress of *blackboard* falls on the second word, as in /,blæk'bɔ:(r)d/, it denotes 'a board which is painted black'. It has been shown that, in English, there are systematic exceptions to this simple picture (Plag 2003: 138), but stress assignment remains a potentially useful criterion for making this kind of distinction.

However, stress as a criterion to distinguish between compounds and phrases has not been investigated in Arabic. In fact, some studies (e.g. Siloni 1997: 21) claim that stress always falls on the right element of N+N combination in Semitic languages, including Arabic, without making a clear distinction between compounds and phrases. Therefore, the examination of stress assignment as a criterion to distinguish compounds from phrases in Arabic remains an area worthy of further investigation. In doing so, this study identifies the default position of stress within N+N combinations in Arabic and one exception to this pattern, which is phonetically conditioned.

2. General Background

2.1 The two possible N+N constructs in MSA and JA

Examination of data in Modern Standard Arabic (MSA) and Jordanian Arabic (JA) suggests that there are **two** possible nominal constructs, which exhibit different behaviours (Altakhaine 2016a).¹ One is the 'the noun-noun genitive construct' (Ryding 2005: 205); it is equivalent to a possessive phrase containing *of* in English, such as *the king of Jordan*. This possessive construct is referred to as the P-construct. The other construct can be considered a type of compounding. Examples of the two types of construct in MSA are:

(1)	bayt-u house-NOM 'the man's house'	r-radʒul-i the-man-GEN	(P-construct)
(2)	ʕarus-u bride-NOM 'the mermaid' lit. the sea bride	l-baħr-i the-sea-GEN	(compound)

¹ Both of these nominal constructs are traditionally grouped under *Idʕaafa* (see footnote 2).

The most prominent morphosyntactic difference between them with respect to N+N combinations within CS/SGC² is the presence in MSA versus absence in JA of the morphosyntactic feature of case, as in the following examples:

- | | | | |
|-----|---|------------------------------|-------|
| (3) | bayt-u/a/i
house-NOM/ACC/GEN
'the man's house' | r-radʒul-i
the-man-GEN | (MSA) |
| (4) | raaʔid-u/a/i
pioneer -NOM/ACC/GEN
'the astronaut'
lit. the space pioneer | l-fadʕaaʔ-i
the-space-GEN | (MSA) |
| (5) | beet
house
'the man's house' | z-zalameh
the-man | (JA) |
| (6) | raaʔid
pioneer
'the astronaut'
lit. the space pioneer | l-fadʕaaʔ
the-space | (JA) |

Note that in the MSA examples (3) and (4), the first element of SGC can be nominative, accusative or genitive depending on the function of the whole N+N combination in the sentence, but the second element is always genitive. In contrast, JA examples (5) and (6) do not have case marking. In consecutive speech a default *-i* appears between the two elements for phonological purposes, i.e. breaking consonant clusters, but that is not a case marker. Furthermore, some lexical differences can be found between MSA and JA. For instance, the word *man* is realised in MSA as *rradzuli* 'the man' in (3), whereas it is *zzalameh* 'the man' in JA (see example 5).

On the basis of the most reliable criteria for compoundhood (e.g. Lieber and Štekauer 2009; Bauer et al. 2013, Altakhaineh 2016b, Altakhaineh 2017 among others), there seems to be two different constructs, i.e. compounds and P-constructs in MSA and JA. The relationship between the two elements of the construct in (1) is one of possession, whilst this is not the case in example (2). Regarding adjacency, it seems that an element such as *haaʕa* 'this' or *baʕdʕ* 'some' can be inserted between the two elements of the construct in (1), whereas such insertion is impossible in (2). With respect to referentiality, the right element in (1) is referential, whereas the right element in (2) is non-referential (Altakhaineh 2016a: 134-135, 172).

Having established that there is some prima-facie plausibility to a division of N+N combinations in MSA and JA into phrases (P-constructs) and compounds, the phonological criterion, i.e. stress is additional evidence to the structural distinction which examples (1) and (2) already demonstrated above. In particular, it will be interesting to examine stress placement in these combinations in order to determine whether it can be used to support the idea that they are indeed two different types of construct.

2.2 Stress assignment at the word level in Arabic

Before outlining the experiment I have conducted, it is important to provide some background on stress assignment in Arabic. Arabic is a language with word stress, which means that one of the syllables in a content word is seen as prominent; thus, it receives primary stress (Watson 2002: 80). Four characteristics related to prominent or stressed syllables have been identified by Spencer (2002: 241). Firstly, a stressed syllable is in general louder than its neighbours. Secondly, a prominent syllable is longer in duration than its neighbouring unstressed syllables. Thirdly, the constituent sounds of a stressed syllable, particularly its onset consonants, are usually more clearly or more forcefully articulated than those in less stressed ones. Finally, a stressed syllable is the crux of pitch movement (accent), reflecting an intonation contour. This entails that a prominent syllable will usually be one uttered on a particularly high (or sometimes low) pitch (Spencer *ibid*).

Explaining stress assignment requires the use of the concept of mora, a phonological unit that determines syllable weight. Essentially, a short vowel is assigned one mora, long vowels two moras and geminate consonants are assigned one mora in the underlying representation (Hayes 1989). This is shown in (7):

- (7)
- | | | |
|---|-----|-----------------|
| μ | μ μ | μ (underlingly) |
| | / \ | |
| V | V | G |

² The Construct State (referred to in Arabic as *Idʕaafah*) is defined as a construct that normally consists of two nouns or an adjective and a noun where the first element can be nominative, accusative or genitive based on the function of the whole construct in the sentence, whereas the second element is always genitive (Al-Rajih 2000: 247). Another important characteristic of the Construct State is that the first element is always indefinite, whereas the second can be definite or indefinite (see Fassi Fehri, 2012: 156). In this study, however, I opted for the term *Synthetic Genitive Construction*, which contrasts with "analytic genitives," that is, with the possessive markers, for example, *li* "for/ of" in MSA. In fact, the "Construct State" refers to the morphological form of the possessum in a construct, for example, the lack of nunation and in some Arabic dialects, for example, Jordanian Arabic, the feminine suffix surfacing with a final /t/, and so on (see Altakhaineh 2016a: 6-7).

A syllable is either heavy or light based on the number of moras it bears. A monomoraic syllable has one mora, a bimoraic syllable has two, and although rare, a trimoraic syllable has three (Hayes 1989). The type of syllable, whether heavy or light, influences the placement of stress (McCarthy 1979). In particular, Hayes (1989, 1995: 52) argues that in some languages stress falls on syllables that have a long vowel or diphthong (CVV) or those that have a geminate in the coda (CVG).³ Syllables characterised by one of these three, i.e. long vowel, diphthong or a geminate, are often regarded as heavy or bimoraic. Conversely, syllables such as (CV) or (CVC) (if on the right edge of the word) are light or monomoraic (Hayes 1989, 1995; Watson 2002). This suggests that CVC syllables that are not on the right edge of the word are considered heavy. Note that syllables in most Arabic dialects are maximally bimoraic and left-dominated. This means that they usually have trochaic feet (Watson 2002: 87). Trochaic feet are defined by Hayes (1995: 80) as 'elements contrasting in intensity from groupings with initial prominence'. In other words, in trochaic feet, the first syllable of the foot is strong, whereas in iambic feet, the last syllable of the foot is strong. Hence, a trochaic foot is left-dominated, whereas an iambic foot is right-dominated. Iambs are asymmetrical binary feet with a weak followed by a strong element, whereas trochees consist of elements which differ in intensity that is, they are binary feet with a strong followed by a weak element (Hayes 1995).

Numerous studies have been conducted on stress assignment at the word level in Arabic, starting with Watson (2002: 81) who argues that a typical peninsular Arabic stress system in the present day follows the following rules:

- (8) Stress a final superheavy syllable (i.e. a syllable that has either one of these templates: CVCC or CVVC). An example of this is *da. 'rast* 'I learned'. That is, when a word has only one heavy syllable, stress falls on it (cf. *CA da. 'rast* 'I learned').
- (9) Otherwise stress the rightmost non-final heavy syllable (up to the antepenultimate), e.g. *'mad.ra.sih* 'school'.
- (10) Otherwise stress the leftmost light syllable, e.g. *'ka.tab* 'he wrote'. Specifically, primary stress falls on the antepenultimate syllable when a word has only light syllables.

Stress assignment in JA follows similar rules to (8-10). In particular, Abu Abbas (2008: 15) describes stress in JA as follows:

- (11) Stress the rightmost heavy syllable if it is not separated from the right edge of the word by more than two syllables. In other words, never stress pre-antepenultimate syllables. This rule is similar to Watson (2002) (see rule 9).
- (12) Stress the antepenultimate syllable in the absence of a heavy syllable. In other words, if the word has only light syllables, stress falls on the antepenultimate. Note that this rule is similar to Watson (2002) (see rule 10).
- (13) Never stress word-final CVC syllables. This rule is mentioned by several phonologists who have studied stress in Arabic (Hayes 1989, 1995; Watson 2002: 91): the peripheral (rightmost) foot is extrametrical and is thus invisible to the stress rules.

As a result, it is clear that syllable weight plays an important role in stress assignment in all dialects of Arabic, including JA (Abu Abbas 2008). Heavy syllables are more eligible to be assigned primary stress in Arabic compared to light syllables. With respect to geminates and stress assignment, Davis (2011: 845) points out that geminates, e.g. *dd*, are different from singleton consonants, e.g. *d*, in that word-final geminates, but not word-final singletons, attract stress to the word-final syllable. For instance, in Hadhrami Arabic spoken in Yemen, geminates attract stress onto the last syllable of the word as in [ʔa'xaff] 'lighter' vs. [ʔakbar] 'greater' (Bamakhramah 2009 cited in Davis 2011: 845). This kind of stress attraction onto the final syllable of the word is related to weight representation. Here, it is important to discuss whether geminates are capable of bearing weight or not. With regard to Lebanese Arabic (henceforth LA), Khattab and Al-Tamimi (2014: 337) argue that, from the viewpoint of a weight-bearing account, syllables that end in a geminate are always heavy. This is because, like other varieties of Arabic, LA is a language which is characterised by being quantity-sensitive, i.e. syllable weight controls stress assignment. Additionally, Bamakhramah (2009) argues that primary stress usually falls on the rightmost bimoraic syllable in Hadhrami dialect spoken in Yemen.

Taking the previous discussion into consideration, syllables ending in a geminate, which are considered bimoraic, will definitely be eligible to bear stress in Arabic. This is because geminates are underlyingly heavy or moraic as mentioned previously. The focus on stress assignment on syllables that have a geminate is particularly important in this experiment as is discussed later.

2.3 Stress assignment in N+N combinations in Arabic

With respect to stress assignment in N+N combinations in Semitic languages, several views have been proposed. For example, Siloni (1997: 21), writing about Hebrew, argues that in the construction known as the 'Nominal State Construct' (referred to in Arabic as *Id'afah*), stress always falls on the second element, which is marked with the

³ Although languages such as *Leti*, *Malayalam* and *Ngalakgan*, have syllables ending in a geminate, they are still considered light (see Hume *et al.* 1997; Baker 2008; Ringen and Vago 2011).

genitive case, whereas the first element, i.e. the head, remains unstressed. ⁴Similarly, concerning stress assignment in MSA, Alexiadou et al. (2007: 248) claim that in examples like (17a, b), stress falls on the possessor *radzul* 'man', the genitive element:

- | | | | | |
|------|----|--|--------------------------|---|
| (14) | a) | bayt-u
house-NOM
'a man's house' | 'radzul-i-n
man-GEN-a | (P-construct) |
| | b) | bayt-r
house-NOM
'the man's house' | 'radzul-i
the man-GEN | (P-construct)

(Alexiadou et al. 2007: 248) |

However, these two examples, which are the only ones discussed by Alexiadou et al. (*ibid*), are insufficient to conclude that stress in MSA always falls on the right element of N+N combinations. First, examples (17a, b) represent one specific construct, i.e. the P-construct. Compounds could have a different stress pattern. Second, these scholars have not addressed stress assignment in all phonological environments of N+N combinations in MSA, e.g. definite vs. indefinite and geminate vs. non-geminate. Third, there are combinations where stress would appear on the first element of both P-constructs and compounds, as in (18) and (19):

- | | | | |
|------|---|----------------------------|---------------|
| (15) | 'ḥaqībat-u
bag-NOM
'the girl's bag' | l-fataat-i
the-girl-GEN | (P-construct) |
| (16) | 'ṣarūus-u
bride-NOM
lit. the sea bride
'the mermaid' | l-bāhr-i
the-sea-GEN | (compound) |

Thus, it appears that some N+N constructs, like (17a, b), have stress on the second element, while others, like (18) and (19), do not. Clearly, these observations call for further investigation. In particular, experimental data are needed in order to determine the position of the stress in N+N combinations in MSA and JA.

In this study, I explore the idea that gemination has an important role in stress assignment in Arabic (see section 4.3). Thus, I have included in my test material N+N combinations with and without gemination to examine the differences in stress assignment in both types. In the combinations that include a geminate, I have taken into consideration different types of geminate, namely, gemination which is part of the lexical specification, as in *munassiq* 'coordinator' and assimilated gemination accompanied by sandhi which appears when the definite article *-l* 'the' is added to a word that starts with a coronal sound, as in *f-ʔams* (underlying *ʔal-ʔams*) 'the sun'.

To the best of my knowledge, no prior study has been conducted on stress assignment in N+N combinations in MSA and JA. The experiment described below will fill this gap, specifically in order to determine whether stress is a criterion that can distinguish between compounds and P-constructs (phrases) in MSA and JA, by conducting an experiment using Praat. The following section provides an overview of the hypotheses and the procedures of the experiment.

3. Hypotheses

As far as N+N combinations are concerned, it is hypothesised that stress assignment depends on whether the second element is definite (i.e. marked with the definite article *ʔal*) or indefinite (i.e. marked with word-final *tanwiin* 'nunation', the indefiniteness marker *-n* which is normally dropped pre-pausally). Note that nouns in MSA can be either marked with the definite article *ʔal-* or nunation *-n*, but never both.⁵ In other words, these are in complementary distribution. This can be illustrated with the following examples:

- | | | | |
|------|----|--|--|
| (17) | a) | bayt-u
house-NOM
'the president's house' | r-raʔiis
the-president |
| | b) | bayt-u
house-NOM
'the/a president's house' | (*r-)raʔiis-i-n
(*the-)president-GEN-INDF |

I formulated the following hypotheses about stress assignment in N+N combinations in both MSA and JA:

⁴ In Arabic, compounding within the Synthetic Genitive Construction (SGC) is predominantly left-headed. The semantic, syntactic, and morphological heads always coincide in Arabic compounds within the SGC (see Altakhaineh 2016c and Altakhaineh 2017).

⁵ Note that *ʔal-bayt* is pronounced *l-bayt* in consecutive speech.

- 1) If the second element is definite, stress falls on the first element or on both elements.
- 2) If the second element is indefinite, stress falls on the first element.

The next section discusses the experiment I conducted in order to confirm or falsify these hypotheses.

4. The experiment

In order to determine whether stress can be used to distinguish compounds from P-constructs in MSA and JA, I tested several adults whose first language is JA. The participants were asked to read a number of compounds and phrases embedded in two paragraphs of running text (one written in MSA and another in JA). I recorded their voices and analysed them using Praat software. The procedure is fully explained in the following subsections.

4.1 Pilot study

Before conducting the experiment, I tested the materials on two native speakers of Arabic to validate the text and methods used. The two participants were asked to read a short paragraph that contained five P-constructs and six compounds and I recorded their speech. The paragraph comprised four sentences. The results showed that one of the sentences was problematic. In particular, the stress on the two compounds in that sentence was not clear due to the presence of contrastive stress. This type of stress is defined as a stress which is assigned to a word or a syllable as opposed to its normal accentuation (Bolinger 1961: 83). This is done to contrast it with another word or syllable or to steer the attention towards it. For instance, in the phrase *parliament of the people, by the people, for the people*, the stress falls on the normally unstressed word *of* in order to focus on the contrast between *of*, *by*, and *for*. Note that, in the above example, two or more items are counterbalanced and a preference indicated for some members of the group (Bolinger *ibid*). Bauer et al. (2013: 445) note that contrastive stress may change the normal stress pattern assigned to a compound, e.g. *She meant Park 'Street, not Park 'Road*. Bauer et al. (*ibid*) suggest that this source of variation is to be ignored; the normal stress position of compounds is detected in non-contrastive environments.

The English translation of the Arabic sentence which caused problem in data analysis ran as follows:

At our school, the maths teacher, the physics teacher and the arts teacher drink a cup of tea every morning.

Here, the three compounds, *muṣallim rriyaad^siyyaat* ‘the maths teacher’, *muṣallim lfiizyaa?* ‘the physics teacher’ and *muṣallim lfann* ‘the arts teacher’ are affected by contrastive stress. To avoid the effects of this type of stress, *muṣallim lfann* ‘the arts teacher’ was replaced by *mudaqqiq lkurraasah* ‘the notes inspector’ while *muṣallim lfiizyaa?* ‘the physics teacher’ was moved to the second paragraph, so that *muṣallim rriyaad^siyyaat* ‘the maths teacher’ and *muṣallim lfiizyaa?* ‘the physics teacher’ are separated by six sentences. Additionally, the pilot study showed that the text contained two words which are not used in JA, namely, *ṣimtihaan ḥaanaawiyya* ‘the secondary school examination’ and *s'abaah masaa?* ‘morning and evening’. These two words were replaced by their JA equivalents, i.e. *ṣimtihaan ttawdziihi* ‘the secondary school examination’ and *s'ubh wu masaa* ‘morning and evening’ (see Appendix 1).

4.2 Sample

Three adults (two female and one male) participated in the experiment, all native speakers of JA. The participants have a good working knowledge of MSA, since they are proficient users and have studied it in detail for twelve years at school. They have also taken two or three modules of advanced MSA in their undergraduate degree in Jordan. Even though the participants are not native speakers of MSA (since MSA has no native speakers), the data collected from MSA will be of importance in this experiment, since it may help provide a clearer picture of stress assignment in N+N combinations in Arabic in general.

4.3 Tools and procedure

The participants were asked to read two paragraphs (one written in MSA and another in JA). These two paragraphs contain a number of compounds (thirteen) and P-constructs (eight) in order to examine whether the position of the stress differs in the two types of construct.

The compounds and P-constructs in the two paragraphs were chosen according to the hypotheses formulated in section 3. Therefore, the possible effect of definiteness vs. indefiniteness was taken into consideration. In particular, if the second element is definite, then it is vital to examine the shape of the definite article in the P-constructs or compounds. It has been proposed that the definite article has an underlying phonological form /ʔal/ (Heselwood and Watson 2013: 34). This form surfaces as [ʔal] when the subsequent word starts with a non-coronal consonant. However, when the subsequent word starts with a coronal consonant, the /l/ completely assimilates to the following coronal, yielding a geminate coronal consonant (Heselwood and Watson *ibid*). For instance, if the definite article is added to *bint* ‘girl’, it surfaces as [ʔal**bb**int] ‘the girl’, but if it is added to *t'aalib* ‘student’, it surfaces as [ʔat^st'aalib].⁶ These aspects could play a role in stress assignment in N+N combinations in MSA and JA. Hence, gemination has been taken into account in selecting the data investigated. Specifically, I have included in my test material N+N combinations with and without gemination in order to investigate the differences in stress assignment in both types. Furthermore, I have taken into account that there are two types of geminate, i.e. lexical geminate and assimilated geminate accompanied by sandhi. Table 1 shows the compounds and P-constructs selected for this experiment based on the above considerations.

⁶ Note that ʔat^st'aalib is pronounced t^st'aalib in consecutive speech

Table 1. N+N compounds and P-constructs in MSA and JA selected in the experiment

Definite 2nd element		
Phonological environment	Compound	P-construct
N1 non-geminate + N2 non-geminate	<ul style="list-style-type: none"> • <i>ʔimtihaan lkiimyyaaʔ</i> ‘the chemistry exam’ • <i>raʔiis lwuzaraaʔ</i> ‘the prime minister’ • <i>mudiir lqaaʕah</i> ‘the head invigilator’ 	• <i>maqsʕaf lmadrasah</i> ‘the school’s canteen’
N1 geminate + N2 non-geminate	• <i>muʕallim lfizyyaaʔ</i> ‘the physics teacher’	• <i>sayyarat lmudiir</i> ‘the director’s car’
N1 non-geminate + N2 geminate	<ul style="list-style-type: none"> • <i>ʕaamil nnaaḏʕafah</i> ‘the cleaner’ • <i>ʔimtihaan θθaanawiyya</i>⁷ ‘the secondary school examination’ • <i>wazīr ttarbiyah</i> ‘the Minister of Education’ 	• <i>kitaab tʕʕaalib</i> ‘the student’s book’
N1 geminate + N2 geminate	<ul style="list-style-type: none"> • <i>muʕallim rriyaadʕiyyaat</i> ‘the maths teacher’ • <i>mudaqqiq lkurraasah</i> ‘the notes inspector’ 	• <i>xutʕʕat lmuʕallim</i> ‘the teacher’s plan’
Indefinite 2nd element		
Phonological environment	Compound	P-construct
N1 non-geminate + N2 non-geminate	• <i>kaʔs ʕasʕiir</i> ‘juice glass’	• <i>kitaab fataah</i> ‘a girl’s book’
N1 geminate + N2 geminate	• <i>muʕallim sʕaff</i> ‘primary school teacher’	• <i>sijill musʕahhihin</i> ‘a marker’s record’
N1 non-geminate + N2 geminate	• <i>faiʕirat tuffaah</i> ‘apple pie’ ⁸	• <i>qalam muʕallim</i> ‘a teacher’s pen’
N1 geminate + N2 non-geminate	• <i>munassiq ʕuluum</i> ‘a science coordinator’	• <i>qubbaʕat tʕʕaalib</i> ‘student’s cap’

Table 1 incorporates the two factors which may play a role in stress assignment in MSA and JA, i.e. (in)definiteness and gemination, as indicated in my hypotheses. In MSA, nunation is the indefiniteness marker, whereas in JA, the absence of the definiteness marker is a sign of indefiniteness, since nunation is not realised in JA.

The selected compounds and P-constructs were embedded in a sequence of natural sentences, forming a realistic piece of discourse as a way to reduce the effect of the observer’s paradox (see Labov 1972: 209). I recorded the participants’ voices in a soundproof room to obtain high quality audio. For recording the paragraph in JA, the participants were given the text in a form where the spelling and diacritics were adapted to JA pronunciation. This was done to avoid the association of written stimuli with MSA. I made sure that the participants were comfortable and at ease. The participants were also assured that they could stop the recording at any time.

4.4 Data analysis

The audio-recordings were analysed using the latest version of Praat (5.4.08), which gives an indication of stress assignment, showing pitch, duration and intensity. *This is due that fact that several studies (e.g. Hammond 1999; Spencer 2002; Odden 2005; Plag et al. 2011: 362 among others) indicate that the pitch, intensity (loudness) and duration are responsible for assigning stress.*

With respect to the acoustic correlates of stress, note that duration is excluded in this study due to the presence of different segments in the examples of P-constructs and compounds, i.e. the target words in both types of construct are not the same. Duration can only be used as a criterion if both examples have the same segments, as in the English phrase *black 'bird* and the compound *'blackbird*. Hence, the recordings in this experiment were fed into the software to examine both pitch (marked with a blue line in the spectrograms) and intensity (marked with a yellow line in the

⁷ The compound *ʔimtihaan θθaanawiyya* ‘secondary school examination’ in the MSA version was replaced in the JA version by *ʔimtihaan ttawjihi* ‘secondary school examination’, since *θθaanawiyya* ‘secondary school’ is no longer used in JA.

⁸ The compound *faiʕirat tuffaah* ‘apple pie’ in the MSA version was replaced in the JA version by *keekit tuffaah* ‘apple pie’, since *faiʕirat* ‘pie’ is no longer used in JA.

spectrograms) in order to determine how they can be used to pinpoint stress, since they are the most reliable acoustic correlates of stress in this case. I determined if there is a difference between the two types of N+N combination on the basis of visual inspection of the spectrogram figures together with auditory impression of the recordings. I also asked four trained native speakers to listen to the recorded items and say where they hear the prominence, then I discarded tokens for which they disagree.

5. Results and discussion

This section presents a sample of the spectrogram figures used in order to test the hypotheses discussed in section 3. Based on the acoustic contours of pitch and intensity, the data analysis shows that stress assignment in the target N+N combinations is the same for all participants in virtually all cases. I have randomly selected some tokens out of 126 tokens (63 for JA and 63 for MSA) to represent the stress patterns.

5.1 N+N combinations marked with definiteness

Since gemination plays a significant role in stress assignment, this section is divided into four sub-sections on the basis of the presence vs. absence of gemination (see Table 1).

➤ **1st non-geminate + 2nd non-geminate**

For this case, three compounds, e.g. *raʔiis lwuzaraaʔ* ‘the prime minister’, *ʔimtihaan lkiimyyaaʔ* ‘the chemistry exam’ and *mudiir lqaaʕah* ‘the head invigilator’, and one P-construct, e.g. *maqsʕaf lmadrasah* ‘the school’s canteen’ were tested. The following spectrogram figures represent two of these combinations.

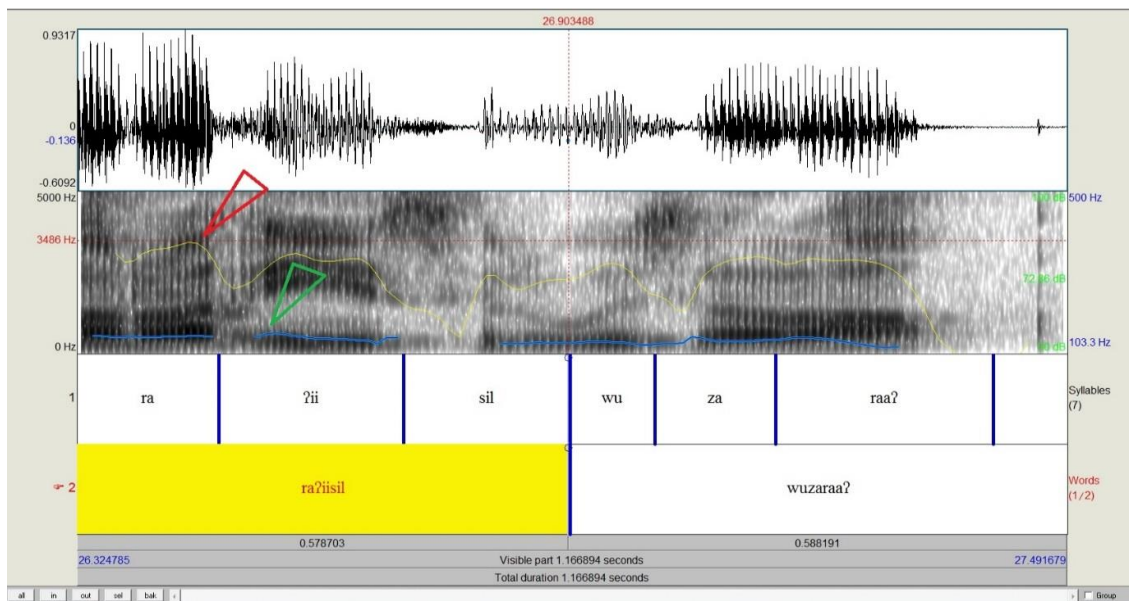


Figure 1. Spectrogram for *raʔiis lwuzaraaʔ* [ra.ʔii.sil.wu.za.raaʔ]⁹ ‘the prime minister’ (compound)¹⁰, MSA

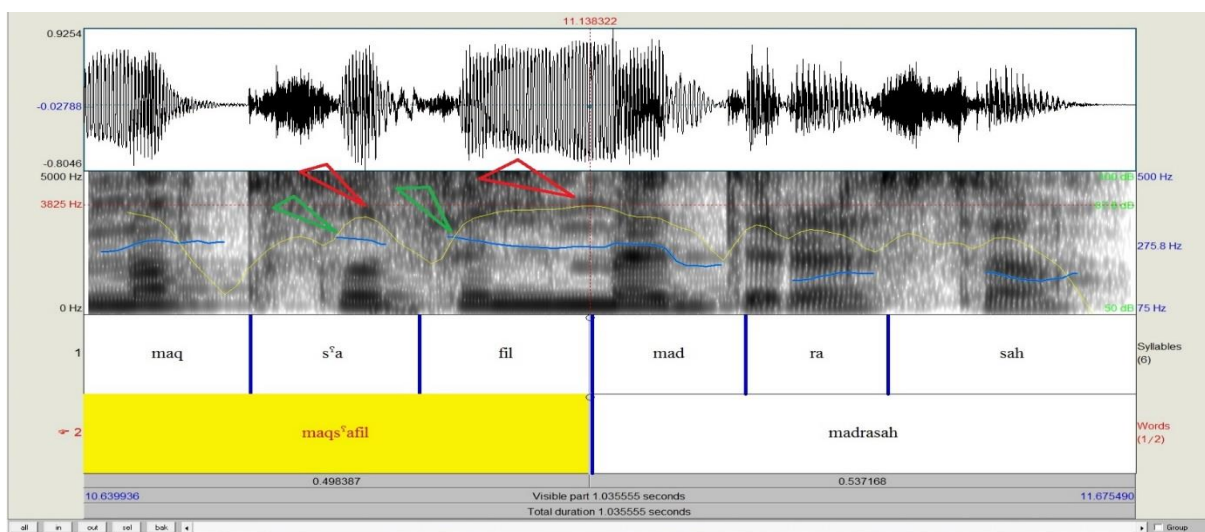


Figure 2. Spectrogram for *maqsʕaf lmadrasah* ‘the school’s canteen’ [maq.sʕa.fil.mad.ra.sah] (P-construct), MSA

⁹ The syllabification given in all spectrograms is performed based on the actual pronunciation of the constructs in the text. The case marked on the N + N combination in MSA is based on its function in the context. In particular, the first element can be nominative -u, accusative -a or genitive -i, whereas the second element is always genitive -i. Remember, however, that the genitive case on the second element is not realised in JA.

¹⁰ The triangles shown in the spectrograms are used to indicate the high values of pitch and intensity, i.e. the red triangles pinpoint intensity, whereas the green ones indicate the pitch.

Looking at the pitch and intensity correlates, the spectrograms in Figures 1-2 show that in the absence of gemination, the stress falls on the first element. This is clear from the fact that in Figures 1 and 2, the values of both the blue (i.e. pitch) and yellow (i.e. intensity) lines are slightly higher on the first element compared to the second element. According to Spencer (2002: 241), a stressed syllable can be more stressed than its neighbours. As a result, we do not need to consider all syllables as either stressed or unstressed. More often than not, in addition to the main stress we will find other stressed syllables in a word or phrase, but these are not stressed to the same degree as the main stressed syllable (Spencer *ibid*). This is known as secondary stress (as opposed to that assigned on the most stressed element, primary or main stress). Data in Figures 1 and 2 may indicate that the second elements *lwuzaraa?* ‘the minister’ and *lmadrasah* ‘the school’ are not completely unstressed. In effect, they could bear secondary stress.

This confirms my hypothesis that in definite N + N combinations, the default position of the stress is on the first element or both, but not on the second. Note that the position of the stress so far does not provide a clear distinction between compounds and P-constructs in MSA and JA. In both cases, the stress falls on the first element.

➤ **1st geminate + 2nd non-geminate**

For the cases where the first word has a geminate, one compound, e.g. *muṣallim lfīziyaa?* ‘the physics teacher’ and one P-construct, e.g. *sayyarat lmudīir* ‘the director’s car’ were included in the experiment. Despite the slight difference in intensity in Figure 3, the pitch is clearly higher on the first element. In general, the spectrogram Figures 3-4 demonstrate that these two combinations seem to be assigned stress on the first element as shown below.

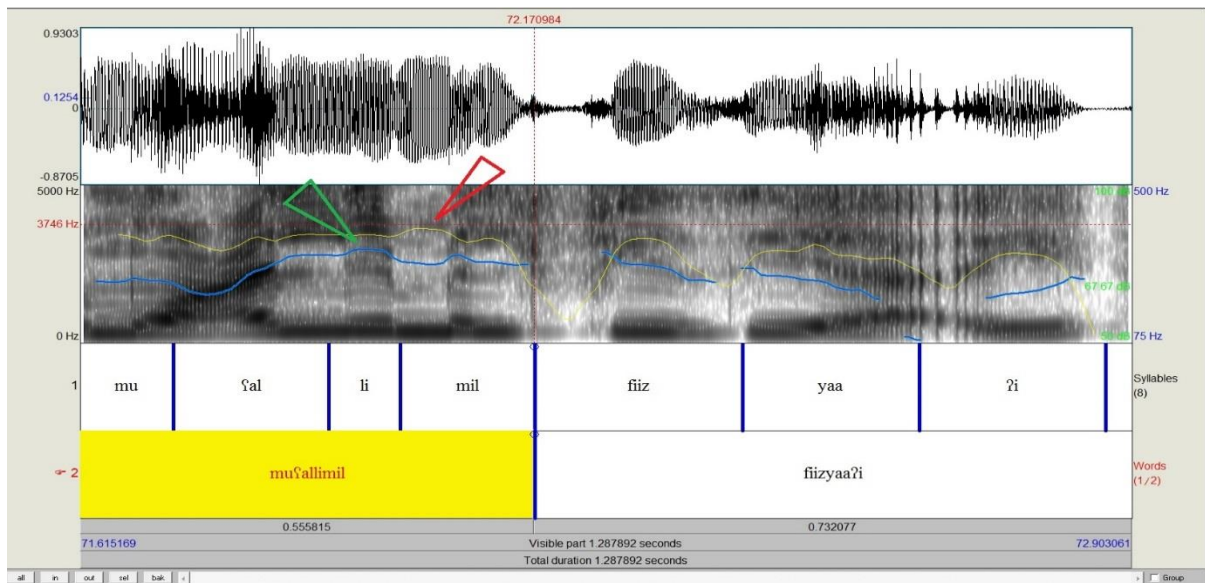


Figure 2. Spectrogram for *muṣallim lfīziyaa?* [mu.ʕal.li.mil.fiiz.yaa.ʔi] ‘the physics teacher’ (compound), MSA

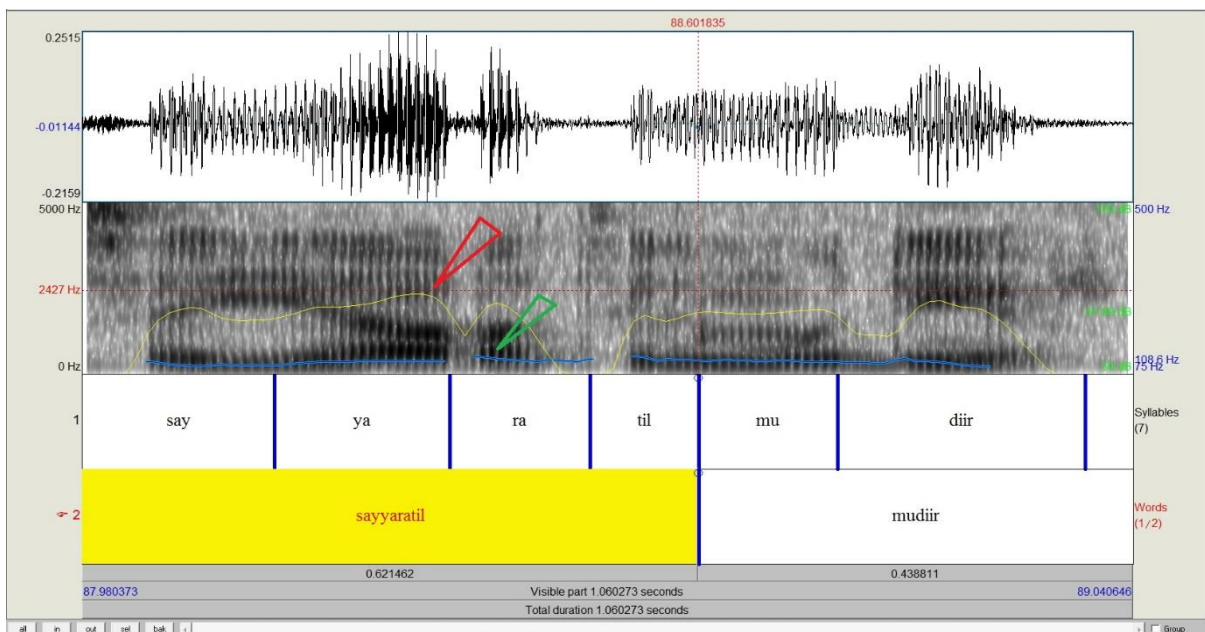


Figure 3. Spectrogram for *sayyarat lmudīir* [say.ya.ra.til.mu.diir] ‘the director’s car’ (P-construct)

Note that in both the compound and the P-construct in Figures 3-4, the first element has a geminate: *muṣallim* ‘teacher’ and *say.ya.rat* ‘car’. However, the presence of the geminate here does not affect stress assignment. Stress appears to fall on the first element also in environments in which no gemination occurs on the first element, as mentioned in the previous section. Even though sandhi also operates in both the compound *mu.ʕal.li.mil.fiiz.yaa.ʔi* ‘the

physics teacher’ and the P-construct *say.ya.ra.til.mu.diir* ‘the director’s car’, it does not have any impact on stress across word boundary. For this to happen, there has to be an assimilated geminate accompanied by sandhi as shown in detail in Figures 5-7.

➤ **1st non-geminate + 2nd geminate**

For the case in which the first element does not contain a geminate and the second does, I included three compounds, namely, *ṣaamil nnaḏʿaafah* ‘the cleaner’, *ḥimtiḥaan θθaanawiyya* ‘the secondary school examination’, and *waziir tarbiyah* ‘the minister of education’, and one P-construct, e.g. *kitaab tʿʿalib* ‘the student’s book’ in the experiment. Figures 5-7 below show one compound, i.e. *ṣaamil nnaḏʿaafah* ‘the cleaner’, in both MSA and JA, and one P-construct, i.e. *kitaab tʿʿalib* ‘the student’s book’.

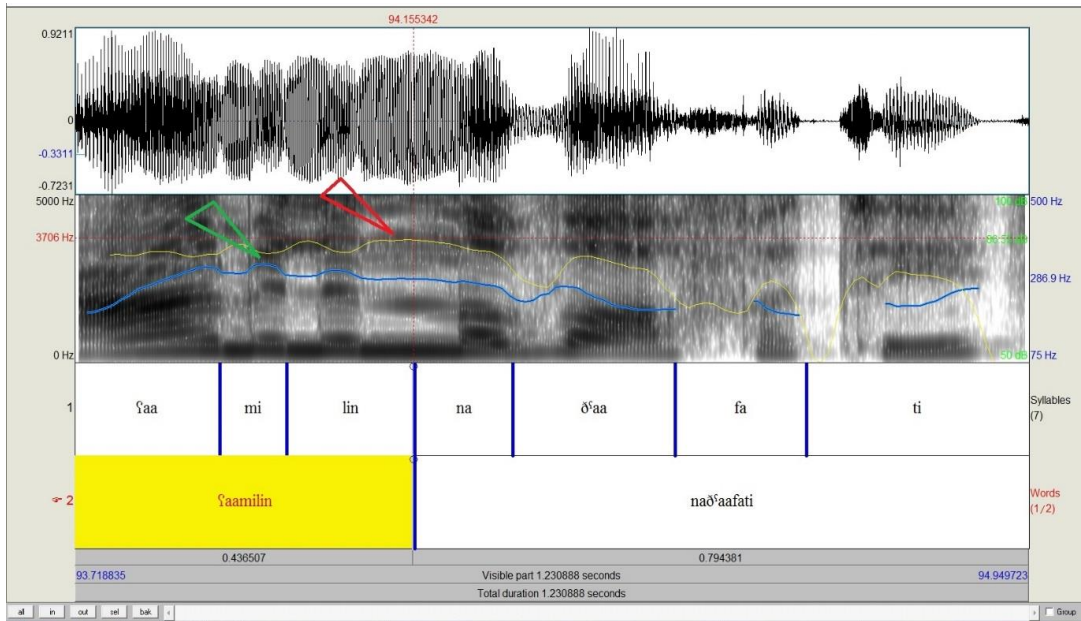


Figure 4. Spectrogram for *ṣaamil nnaḏʿaafah* [ṣaa.mi.lin.na.ḏʿaa.fa.ti] ‘the cleaner’ (compound), MSA

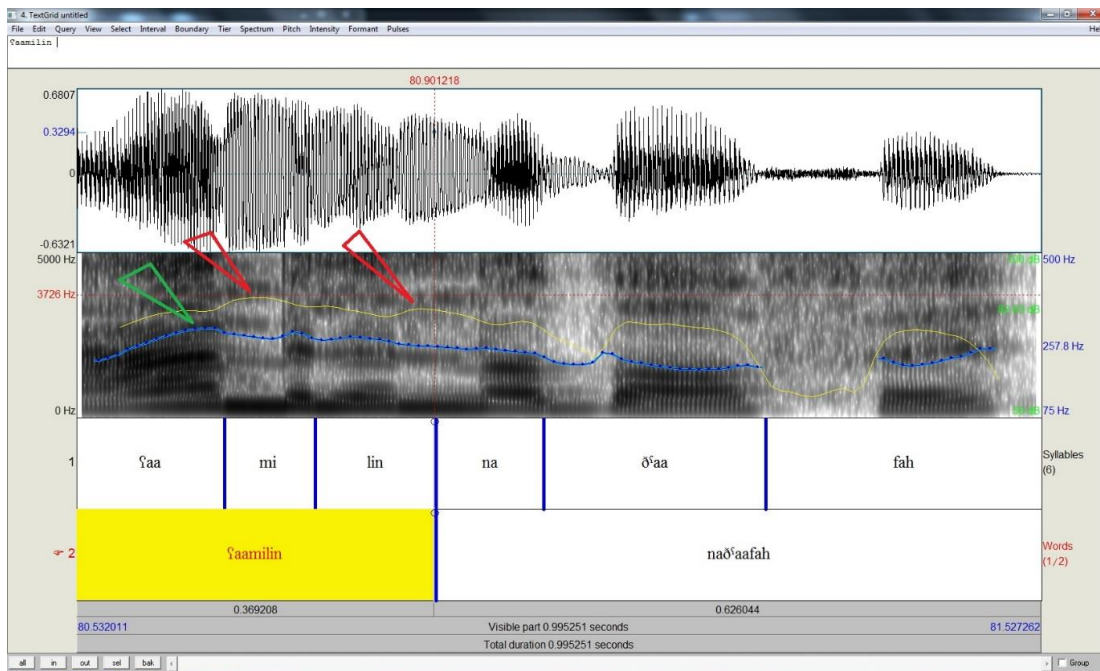


Figure 5. Spectrogram for *ṣaamil nnaḏʿaafah* [ṣaa.mi.lin.na.ḏʿaa.fah] ‘the cleaner’ (compound), JA

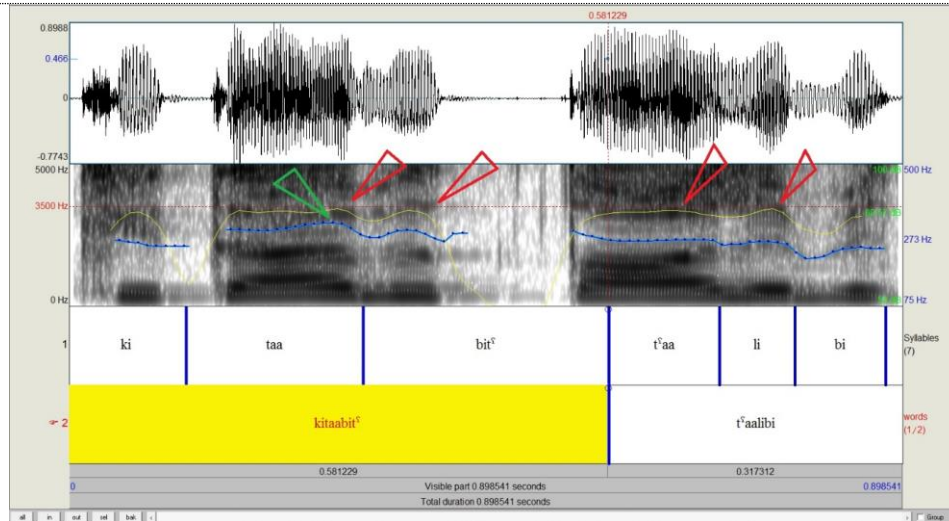


Figure 6. Spectrogram for *kitaab t'raalib* [ki.taa.bit'.t'aa.li.bi] ‘the student’s book’ (P-construct), MSA

Figures 5-7 show that in both *ṣaamil nnaḍ'aaḥ* ‘the cleaner’ and *kitaab t'raalib* ‘the student’s book’, stress seems to fall on the first element, characterised by a peak, i.e. one prominent syllable. It is clear that, as shown by the red and green triangles in the figures above, the first elements *ṣaamil* ‘worker’ and *kitaab* ‘book’ have higher pitch (the blue line) and intensity (the yellow line) than the second elements. Note, however, that there is a tiny decrease in the intensity contour across word boundaries, making it appear as though the second element is also stressed. The common factor between the elements of both N + N combinations is that the second element contains a geminate and that the two elements are connected together by sandhi as mentioned in section 3.4. Specifically, the first consonant of the geminate in *ṣaa.mi.lun.na.ḍ'aa.ḥa.ti* ‘the cleaner’ forms the coda of the last syllable of the first element, i.e. *lun*, whereas the second consonant of the geminate syllabifies as the onset of the first syllable of the second element, i.e. *na*. The syllabification process of *ṣaa.mi.lun.na.ḍ'aa.ḥa.ti* ‘the cleaner’ is demonstrated in Figure 8 below, in which O stands for onset, R for rhyme, N for nucleus and C for coda:

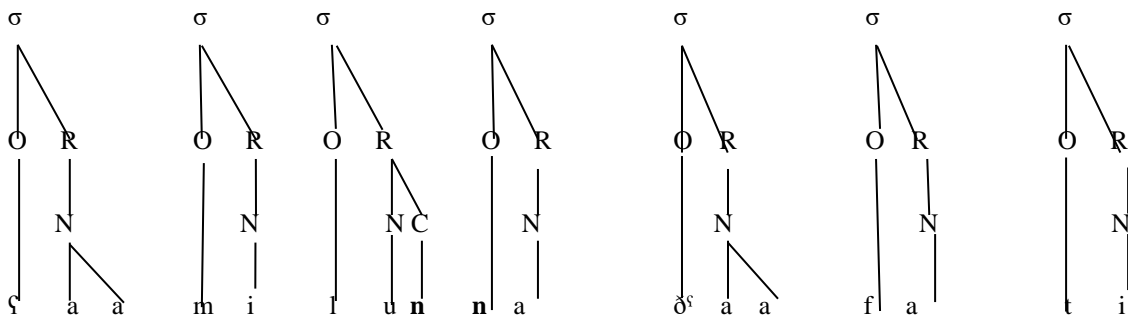


Figure 8. Syllabification of *ṣaa.mi.lun.na.ḍ'aa.ḥa.ti* ‘the cleaner’

When they are connected by sandhi, i.e. *ṣaa.mi.lun.na.ḍ'aa.ḥa.ti* ‘the cleaner’ and *ki.taa.but'.t'aa.li.bi* ‘the student’s book’, the intensity seems to be affected by the presence of the assimilated geminate, causing the fall at the onset of the first syllable of the second element to be only very slight, as shown in Figures 5-7. Simply put, the geminate does not only affect the coda of *lun* and *but'*, but also the onset of the second syllables *na* and *t'aa*, respectively. The ability of the geminate to affect both the onset and the coda is not surprising because it is the same segment which appears in the onset and in the coda; the segment has the same acoustic properties. Consequently, I would suggest that in N + N combinations with assimilated geminates on the word boundary, a secondary stress or perhaps double stress is assigned.

The presence of a geminate in their examples may explain why Alexiadou *et al.* (2007: 248) claim that the stress falls on the second element in N + N combinations such as *baytr 'radzul* ‘the man’s house’. The assimilation of *l-* to *r* creates a geminate in the coda. As explained previously, the geminate is bimoraic; thus, it attracts stress. Therefore, according to Alexiadou *et al.* (2007: 248), the second element is assigned the primary stress. However, the experiment I conducted provides somewhat a more detailed picture of stress assignment in N + N combinations. The gemination accompanied by sandhi found in such examples affects stress, but it does not shift it completely from the first element. This argument is supported by the fact that if the second definite element starts with a non-coronal consonant so that there is no assimilation, and in turn no gemination, the stress clearly falls on the first element only (see Figures 3-4). The spectrogram figures also show that stress is assigned to the first element in both compounds and P-constructs, which means that it does not help in differentiating between them.

➤ **1st geminate + 2nd geminate**

For this case, one P-construct and two compounds are included in the paragraph which the five participants read, namely, *muṣallim rriyaad'iyyaat* ‘the maths teacher’ and *muṣallim taariix* ‘the history teacher’ (compounds), and

xut^ʕat lmuʕallim ‘the teacher’s plan’ (P-construct). Figures 9-10 show the spectrograms for the two items of N+N combinations.

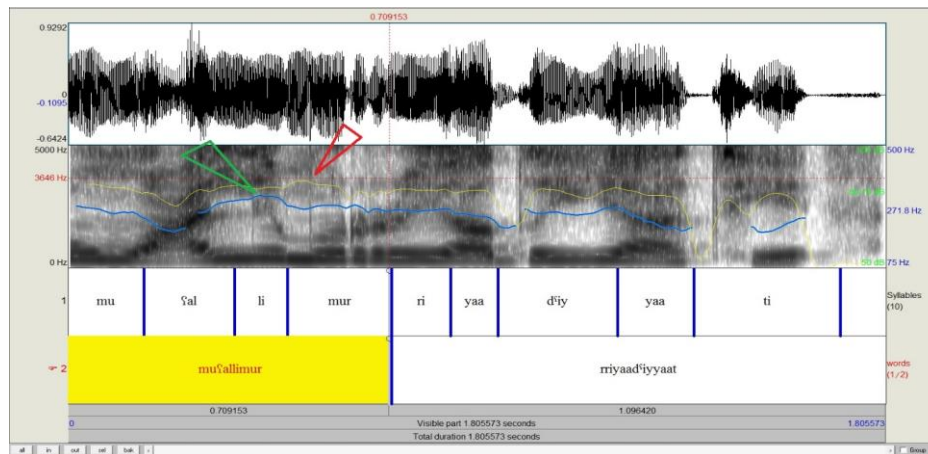


Figure 9. Spectrogram for *muʕallim rriyaadʕiyyaat* [mu.ʕal.li.mur.ri.yaa. dʕiy.yaa.ti] ‘the maths teacher’ (compound), MSA

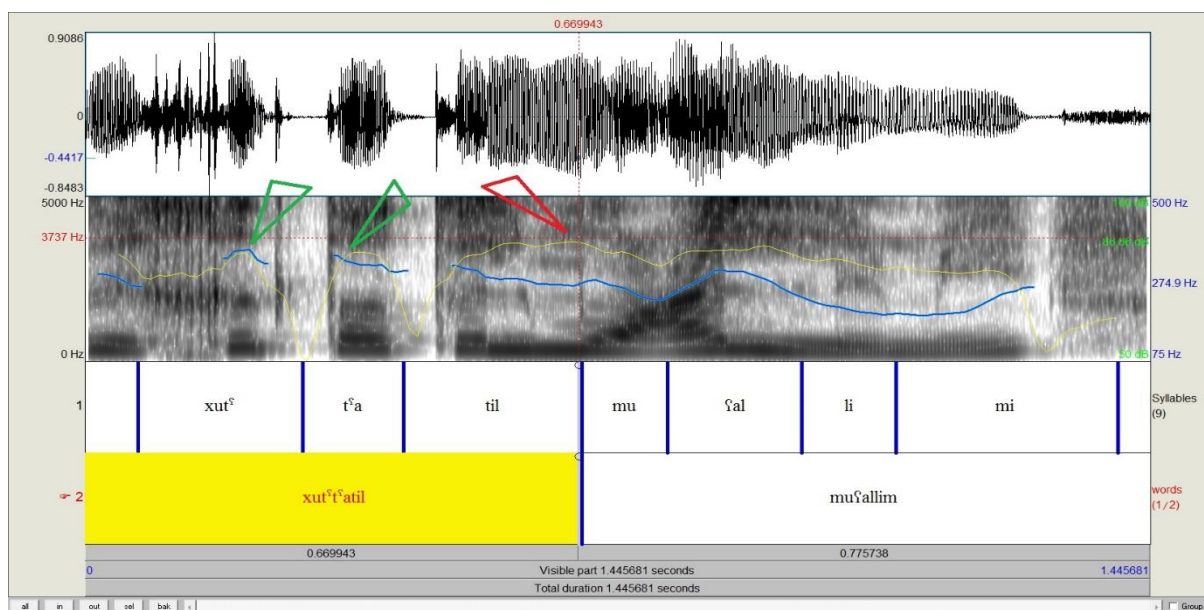


Figure 10. Spectrogram for *xutʕat lmuʕallim* [xutʕ.tʕa.til.mu.ʕal.li.mi] ‘the teacher’s plan’ (P-construct), MSA

Figure 9 shows that the compound, i.e. *muʕallim rriyaadʕiyyaat* ‘the maths teacher’ is assigned stress on the first element. However, the presence of an assimilated geminate together with sandhi means that the intensity contour falls only very slightly across the word boundary. Figure 10 shows that the P-construct, i.e. *xutʕat lmuʕallim* ‘the teacher’s plan’, in which the second element does not start with a coronal sound is assigned stress on the first element with a fall of both intensity and pitch contours. Although sandhi also operates in the P-construct, i.e. *xutʕ.tʕa.til.mu.ʕal.lim* ‘the teacher’s plan’, it does not have an effect on stress across word boundaries. The decisive factor seems to be that there has to be an assimilatory gemination for stress to be influenced across word boundaries. Hence, stress is assigned to the default position, i.e. the first element. Similar to the first element *xutʕat* ‘plan’ in which a geminate is present, the second element also has a lexical geminate, i.e. *lmuʕallim* ‘teacher’. Yet, the stress falls on the first element not on the second.

Even though the position of the stress in the compound in Figure 9 and the P-construct in Figure 10 is on the first element, there is a subtle difference in the decline of the pitch and intensity contours across word boundary. This difference is purely a phonological one caused by assimilatory geminate. The examples *ʕaamil nnaδʕaafah* ‘the cleaner’, and *kitaab tʕalib* ‘the student’s book’ represented in Figures 5-7 respectively have a similar stress pattern to *muʕallim rriyaadʕiyyaat* ‘the maths teacher’ in Figure 9 due to the assimilatory geminate together with sandhi (the intensity contour falls slightly on the second element affecting stress across word boundary in both cases). Note that all other cases show that stress does not differentiate between compounds and P-constructs in MSA and JA.

The paragraph in the test included another compound that has a geminate in the second element but not an assimilated one, which can be used to check whether *muʕallim rriyaadʕiyyaat* ‘the maths teacher’ is indeed a special case. Figure 11 below shows this example.

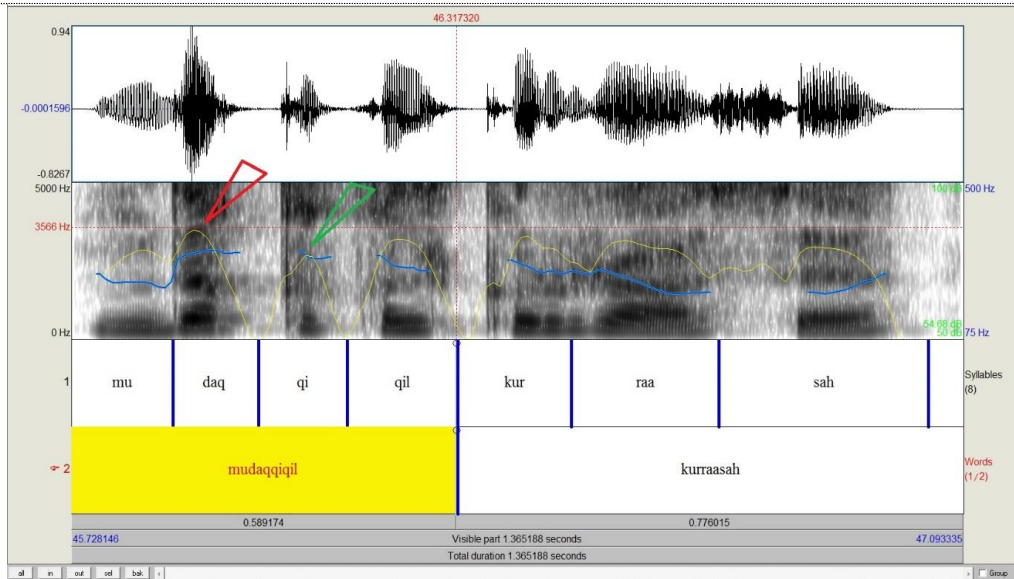


Figure 11. Spectrogram for *mudaqqiq lkurraasah* ‘the notes inspector’ [mu.daq.qi.qil.kur.raa.sah] (compound), JA

Figure 11 shows that in the absence of an assimilated geminate, the stress seems to fall on the first element even though sandhi operates in this example: *mu.daq.qi.qil.kur.raa.sah* ‘the notes inspector’ (with the position of sandhi shown in bold). Note that both the P-construct in Figure 9 and the compound in Figure 11 are assigned stress on the first element, which means that stress cannot be used to make a distinction between the two types of N+N combination.

This section has shown that the first hypothesis about stress assignment in N+N combinations (i.e. if the second element is definite, stress falls on the first element or on both elements) should be refined: stress usually falls on the first element, but in N+N combinations with assimilated geminates on the word boundary, a secondary stress or perhaps double stress is assigned to the second element. The next section provides an examination of stress assignment in indefinite compounds and P-constructs. The next section provides an examination of stress assignment in indefinite compounds and P-constructs.

5.2 N + N combinations not marked with definiteness

This section is divided into four sub-sections on the basis of the presence vs. absence of gemination (see Table 1).

➤ 1st non-geminate + 2nd non-geminate

For this case, three compounds were included in the experiment, i.e. *layla nahaar* ‘twenty four-seven’, *s‘abaah masaa?* ‘twenty four-seven’, and *kaʔs ʕas‘iir* ‘juice glass’ and one P-construct, i.e. *kitaab fataah* ‘a girl’s book’. The analysis shows that the stress tends to fall on the first element in all of them. Figures 12-14 below represent this case.

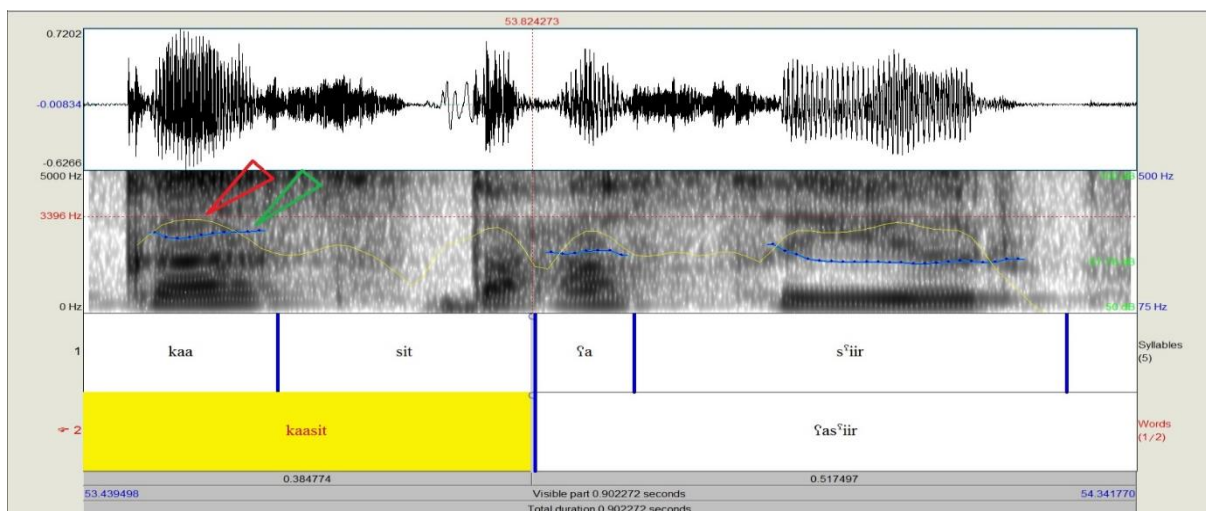


Figure 12. Spectrogram for *kaʔs ʕas‘iir* (*kaasit ʕas‘iir*, in JA) [kaa.sit ʕa.s‘iir] ‘juice glass’ (compound), JA

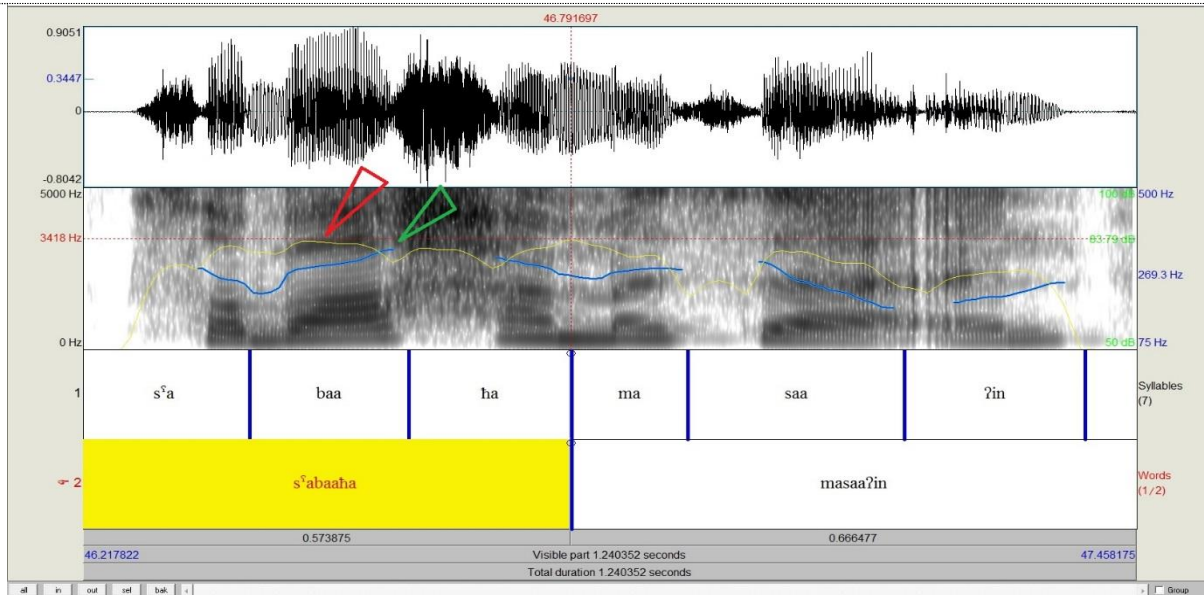


Figure 13. Spectrogram for *s'abaah masaa?* [s'a.baa.ha ma.saa.ʔin] 'twenty four-seven' (compound), MSA

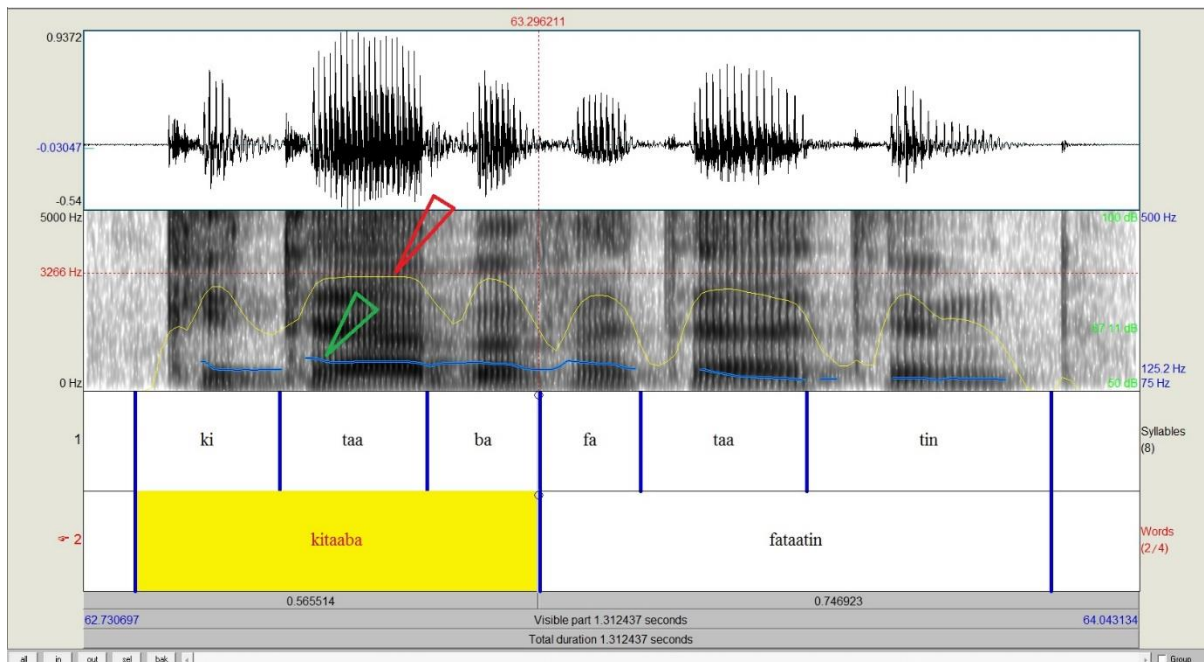


Figure 14. Spectrogram for *kitaab fataah* [ki.taa.ba fa.taa.tin] 'a girl's book' (P-construct), MSA

The three figures above show that the first elements of both the compounds (see Figure 12 and 13) and the P-construct (see Figure 14) are pronounced more forcefully and clearly. The pitch and intensity contours have higher values on the first element, which means that the first element is more stressed than the second (see the red and green triangles above). It is worth pointing out that the intensity and pitch values are slightly high at the end in Figure 12 because of the presence of a superheavy syllable, i.e. *s'iir*, which has the template CVVC (cf. Watson 2002)

➤ **1st geminate + 2nd non-geminate**

For the purpose of the experiment, one compound, e.g. *munassiḡ suluum* 'a science coordinator' and one P-construct, e.g. *qubbaṣat ʔaalib* 'a student's cap' were tested. Figures 15-16 below show that stress is assigned on the first element on both the compound and the P-construct.

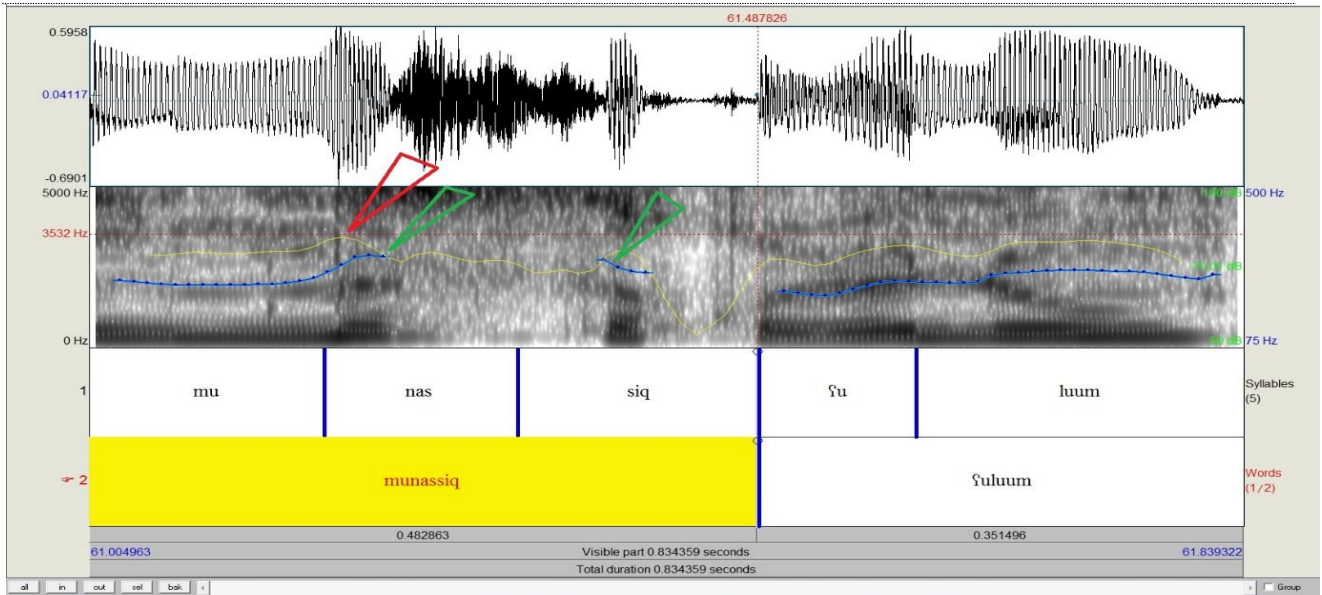


Figure 15. Spectrogram for *munassiq ʕulum* [mu.nas.siq ʕu.luum] ‘a science coordinator’ (compound), JA

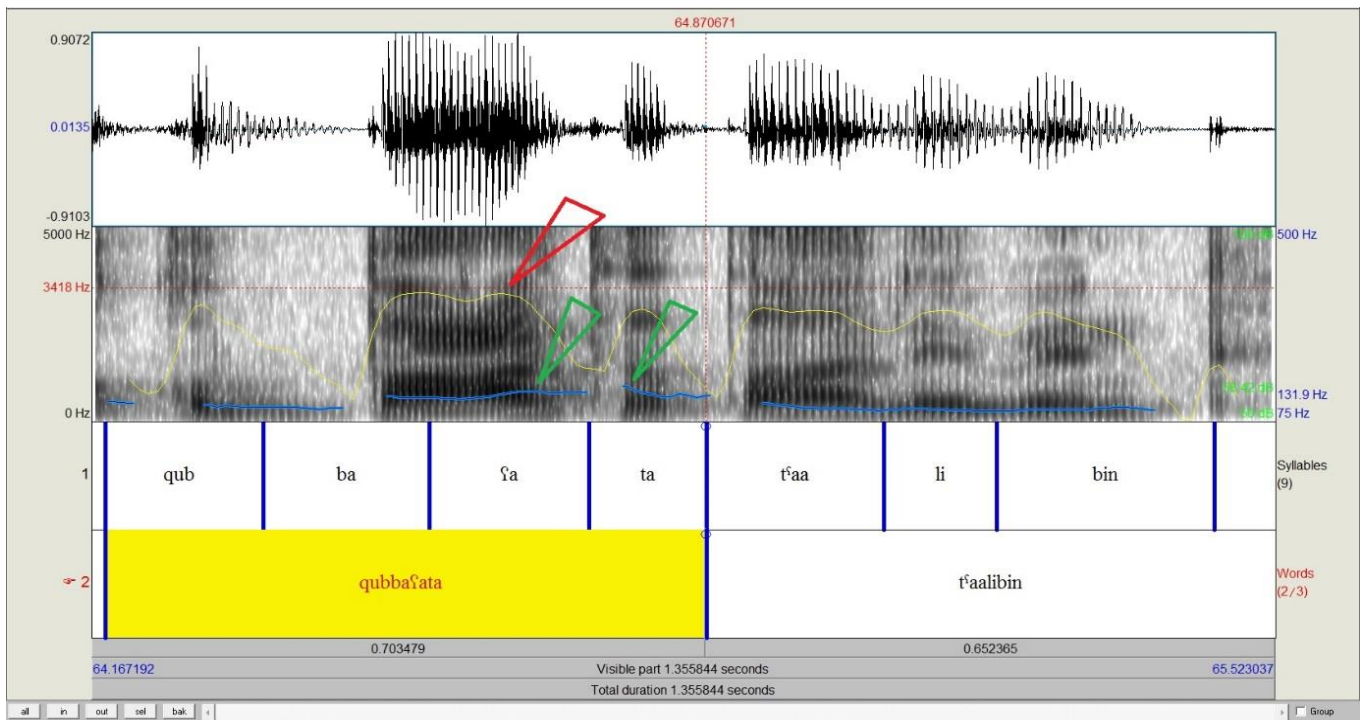


Figure 16. Spectrogram for *qubbaʕata tʕaalib* [qub.ba.ʕa.ta tʕaa.li.bin] ‘a student’s cap’ (P-construct), MSA

Even though the first element in both the compound and the P-construct has a geminate, i.e. *mu.nas.siq* ‘a coordinator’ and *qub.ba.ʕata* ‘a cap’, this does not have an effect on stress. In environments in which the first element does not contain a geminate (see the previous section), stress tends to fall on the first element, which means that stress is assigned by default on the first element. Here too, it is worth pointing out that the intensity and pitch values are slightly high at the end in Figure 15 (the same was observed in Figure 12) because of the presence of a superheavy syllable, i.e. *luum*.

➤ **1st non-geminate + 2nd geminate**

For this case, one compound, e.g. *fatʕirat tuffaah* ‘apple pie’ and one P-construct *qalam muʕallim* ‘a teacher’s pen’ were included in the experiment. Spectrograms for the two types of construct are presented in Figures 17-18.

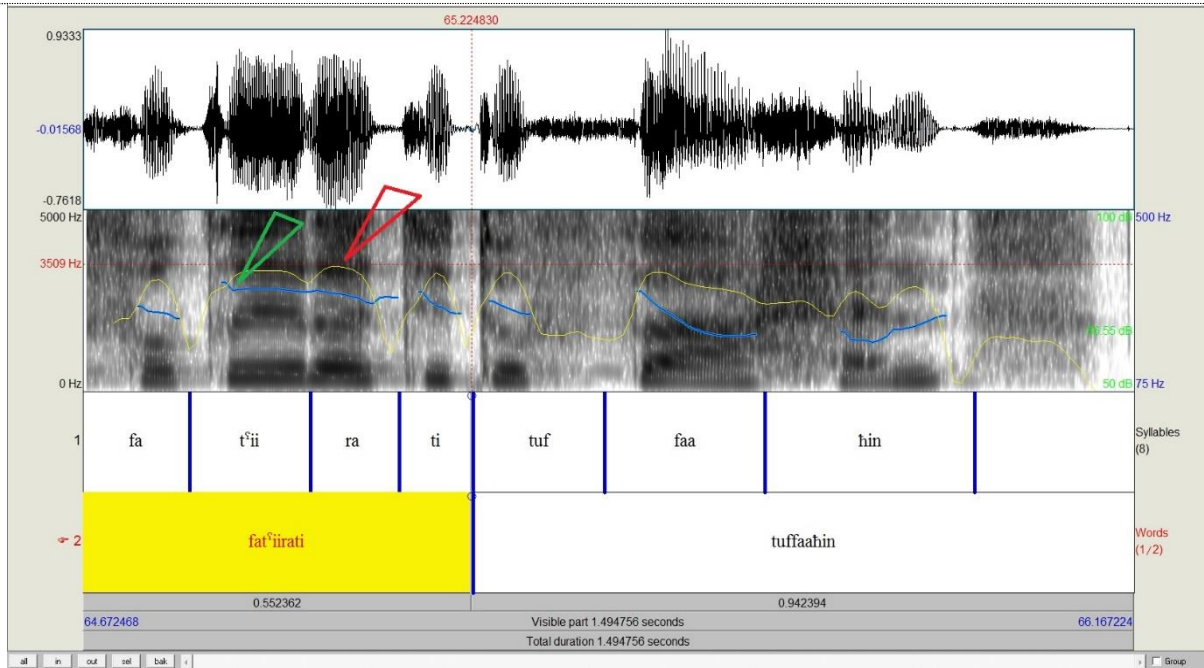


Figure 17. Spectrogram for *fatʿiirat tuffaah* [fa.tʿii.ra.ti tuf.faa.hin] ‘apple pie’ (compound), MSA

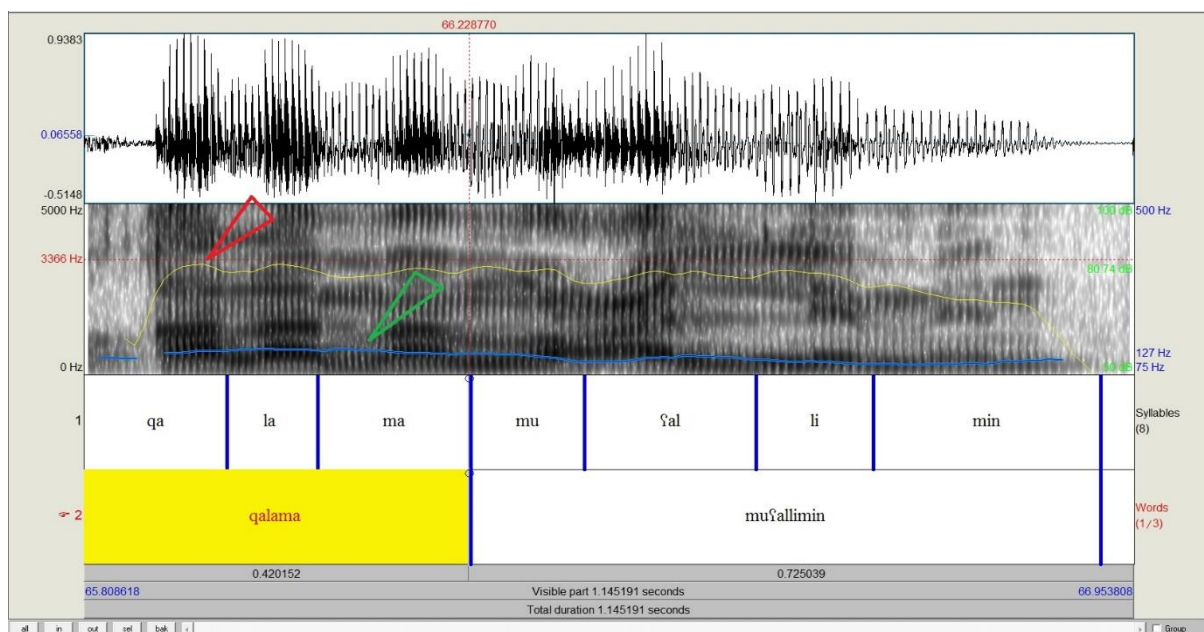


Figure 18. Spectrogram for *qalam muʿallim* [qa.la.ma mu.ʕal.li.min] ‘a teacher’s pen’ (P-construct), MSA

The three figures above show that stress tends to appear on the first element in both the compounds (see Figure 17) and the P-construct (see Figure 18). Despite the fact that the second elements of both constructs contain a geminate, i.e. *tuf.faaḥ* ‘apple’ and *mu.ʕal.liḥ* ‘teacher’, the main stress falls on the first element, rather than on the second. Note, however, that even if the main stress falls by default on the first element, that does not mean that the second element is not stressed at all (cf. Spencer 2002). While the main stress clearly falls on the first element (i.e. *fatʿiirat* ‘pie’ and *qalam* ‘pen’ in *fatʿiirat tuffaah* ‘apple pie’ and *qalam muʿallim* ‘a teacher’s pen’), the second element (i.e. *tuffaah* ‘apple’ and *muʿallim* ‘teacher’) is not unstressed; it is assigned secondary stress.

Again, with regard to this case, it is evident that stress fails to differentiate between compounds and P-constructs in MSA and JA.

➤ 1st geminate + 2nd geminate

In this case, one compound, i.e. *muʕallim sʕaff* ‘a primary school teacher’ and one P-construct, e.g. *sidzill musʕahḥih* ‘a marker’s record’ were tested. Figures 20-21 represent the two types of construct.

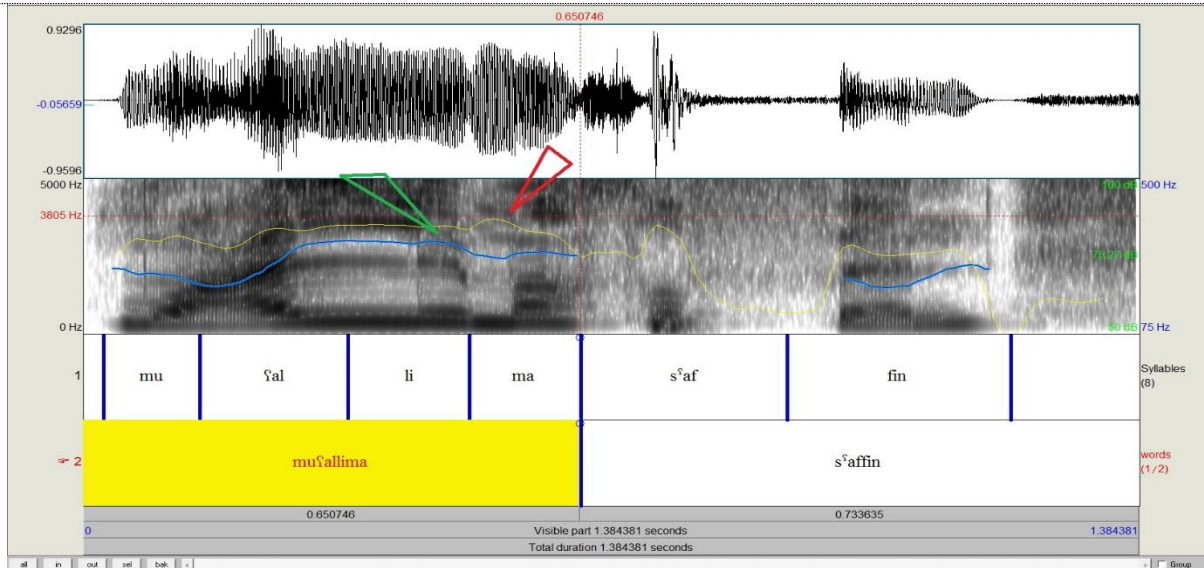


Figure 19. Spectrogram for *muṣallim sʿaff* [mu.ṣal.li.ma.sʿaf.ḥin] ‘a primary school teacher’ (compound), MSA

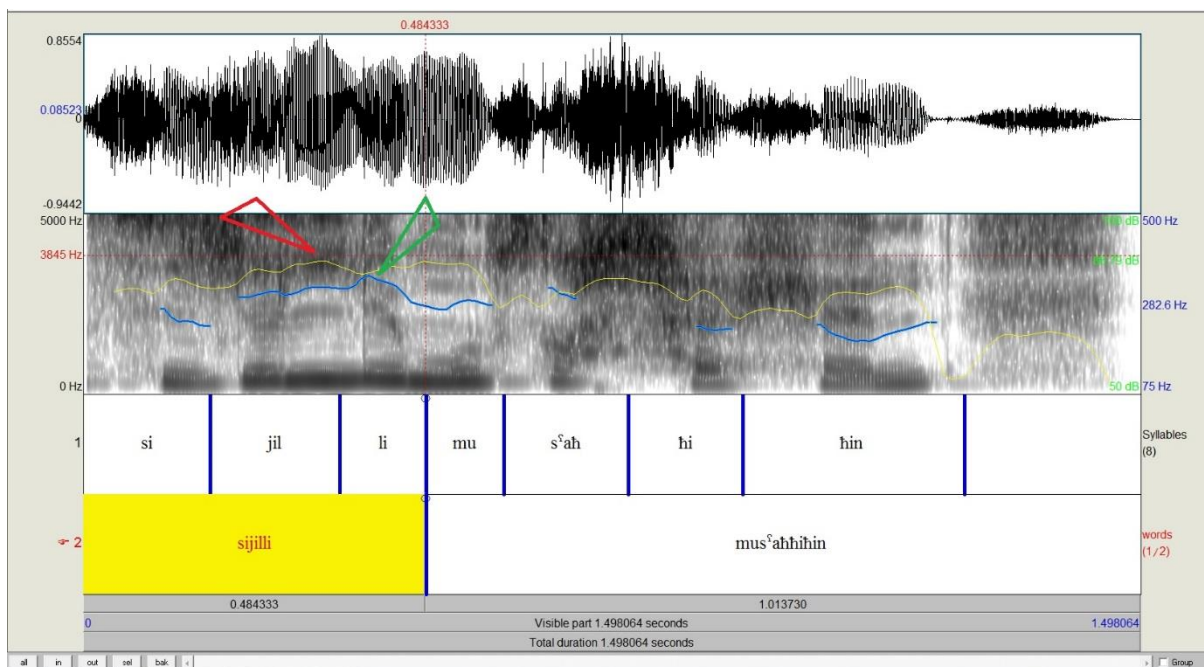


Figure 20. Spectrogram for *sidzill musʿahhiḥ* [si.dzil.li.mu.sʿah.ḥi.ḥin] ‘a marker’s record’ (P-construct), MSA

The two figures show that both pitch and intensity seem to have higher values on the first element. Therefore, the first element seems to be more stressed, in both the compound (see Figure 19) and the P-construct (see Figure 20). Hence, in this case too, stress offers no help in differentiating between compounds and P-constructs in MSA and JA.

6. Conclusion

Examination of spectrogram data shows that stress assignment in Arabic is variable. In particular, data analysis demonstrates that the default position of the stress in N+N combinations in MSA and JA seems to be on the first element. However, the presence of an assimilated geminate on the boundary between the two words has been shown to cause a very slight fall in intensity contour, making it appear as though stress is assigned to both elements. Both compounds and phrases show similar stress assignment in all cases. This indicates that stress plays no role in distinguishing between various N+N combinations (i.e. compounds and P-constructs) in MSA and JA. Thus, the second hypothesis is confirmed (an indefinite second N does not have stress), whereas the first hypothesis is partially confirmed (a definite second N has secondary stress or perhaps double stress).

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Appendix 1: Information for participants and reading texts in MSA and JA

A) Information for participants

السادة/السيدات الأفاضل،

أود أن أدعوكم للمشاركة في دراسة تتمحور حول علم الصرف في اللغة العربية الفصحى واللهجة الأردنية. ستكون المشاركة في هذه الدراسة اختيارية، فبإمكانكم التراجع أو التوقف عن التسجيل في أي وقت دون أي عواقب ودون الحاجة للتفسير. أنتم غير مطالبين بذكر أسمائكم أو أيه معلومات شخصية أخرى خاصة بكم. إن الشخص الوحيد الذي لديه صلاحية الاستماع للتسجيلات هو الباحث فقط. سأقوم بتسجيل أصواتكم لمدة تتراوح بين 3-5 دقائق. قد لا تستطيعون الاستفادة بصورة مباشرة من المشاركة في هذه الدراسة، ولكن مشاركتكم قد تساعد على تحسين فهمنا لعلم الصرف في اللغة العربية الفصحى واللهجة الأردنية. مشاركتكم في هذه الدراسة مهمة للغاية فلكم منا كل التقدير.

إذا كان لديكم أية أسئلة حول هذه الدراسة أو إذا كنتم ترغبون في الحصول على ملخص للنتائج، فلا تترددوا في التواصل معي عبر البريد الإلكتروني الخاص بي: tkabd@yahoo.com.

اقرأ الفقرات التالية بصوت واضح واذكر جنسيتك في بداية التسجيل.

B) The reading text in Modern Standard Arabic (MSA)

في مدرستنا يشربُ مُعَلِّمُ الرِّياضيّاتِ البعيدُ النَّظْرُ القهوهَ كلَّ صباحٍ في مقصفِ المدرسة. ويعملُ هو ليلَ نهارٍ على تطويرِ خِطَّةِ المُعَلِّمِ وكتابِ الطَّالِبِ التَّعليميِّ قابلتِ المدرسةُ بناءً على قرارِ وزيرِ التَّربيةِ والتَّعليمِ ورئيسِ الوزراءِ. تبحثُ المدرسةُ الآنَ عن سجلِّ مصبَحٍ كان قد فُقدَ الأسبوعَ الماضي. إضافةً إلى ذلك، مُعَلِّمٌ صَفِّ ليعملَ في المدرسة. تُدرِّسُ المدرسةُ جَدِيدَ الكُتُبِ في جميعِ المراحلِ التَّعليميَّةِ.

في هذا الوقتِ من العامِ، يدرِّسُ الطُّلابُ صباحَ مساءٍ حتَّى يستطيعوا النَّجاحَ في امتحانِ النَّاتويَّةِ العامَّةِ. قبلَ بدايةِ الامتحانِ، يَنكُذُ مدقُّ الكُرَّاسَةِ من عدمِ إحضارِ الطُّلابِ لأَيَّةِ موادٍ إضافيَّةِ. ويُصحِّحُ الطُّلابُ بِشربِ كأسِ عصيرٍ وتناولِ فطيرةٍ تَفَاحٍ قبلَ الإمتحانِ. وصفتِ الطَّالِبَاتُ امتحانَ الكيمياءِ لمُعَلِّمِ الفيزياءِ والذي يعملُ كمنسِّقٍ علومٍ في المدرسةِ بأنَّه حلُّ مرٌّ بسببِ سهولَةِ الأسئلةِ من جانبٍ وَقَلَّةِ الوقتِ من جانبٍ آخر. بعدَ انتهاءِ الامتحانِ، وجدَ مديرُ القاعةِ كتابَ فتاةٍ وَقُبْعَةً طَالِبٍ وقلمَ مُعَلِّمٍ على الأرضِ فغَضِبَ وطلبَ من عاملِ النَّظافةِ إزالتَهُم وإعادَتَهُم إلى سيارَةِ المديرِ.

C) The reading text in Jordanian Arabic (JA)

في مدرستنا يشربُ مُعَلِّمُ الرِّياضيّاتِ اللَّي نظره بعيدَ القهوهَ كلَّ يومِ الصَّبَحِ في مقصفِ المدرسة. ويعملُ هو ليلَ نهارٍ عشان يطوِّرُ خِطَّةَ المُعَلِّمِ وكتبِ الطُّلابِ حسبَ قرارِ وزيرِ التَّربيةِ والتَّعليمِ ورئيسِ الوزراءِ. بتدوِّرُ المدرسةُ هَسَه عن سجلِّ مصبَحٍ ضاعَ الأسبوعَ الماضي. وكمان قابلتِ المدرسةُ مُعَلِّمَ صَفِّ عشان يشتغلَ في المدرسة. المدرسةُ تبعتنا بتدوِّرُ الكُتُبِ الجديده في كلِّ الصَّفوفِ.

هسه، بدرسِ الطُّلابِ ليلَ نهارٍ عشان ينجحوا في التَّوجيهِ. قبلَ ما يبيلِّشِ الامتحانِ، مدقُّ الكُرَّاسَةِ بيتأكدُ اتو ما حد جاب أي كُتُبٍ إضافيَّة. لازمِ الطُّلابِ يشربوا كاسه عصيرٍ ويوكلوا كيكه تَفَاحٍ قبلَ الإمتحانِ. حكَّتِ البناتِ لمُعَلِّمِ الفيزياءِ اللَّي يشتغلُ منسِّقٍ علومٍ في المدرسةِ اتو امتحانِ الكيمياءِ كان حلُّ مرٌّ عشانِ الأسئلةِ كانت سهله بس الوقتِ كان قليل. بعدَ ما خلصَ الامتحانِ، لقيَ مديرُ القاعةِ كتابَ بنتٍ وطاقيَّةٍ ولدٍ وقلمَ مُعَلِّمٍ مرمياتٍ على الأرضِ فعصَّبَ وطلبَ من عاملِ النَّظافةِ بقمهم ويرجعهم لسيارةِ المديرِ.

D) Information for participants and reading text translated into English

1) Information for participants

Dear participants,

You are invited to participate in a study about morphological processes in MSA and JA. Participation is entirely voluntary; you may withdraw your consent or discontinue participation at any time without any consequences or any explanation. This study will not record your names or other identifying information; participation is therefore anonymous. Only I will listen to the recordings. Participation will take up approximately 3 to 5 minutes of your time. You may not benefit directly from taking part in this study, but your participation may help to improve our understanding of how some morphological processes operate in MSA and JA. Your participation is highly appreciated and is required for completion of this study.

If you have any questions about this study or you would like to have a summary of the results, please feel free to contact me at tkabd@yahoo.com.

Please read the following paragraphs in a clear voice and mention your nationality at the beginning of the recording.

2) The reading text

At our school, the far-sighted maths teacher drinks coffee every morning in the school's canteen. He is working day and night to develop the teacher's plan and the student's educational book in accordance with the regulations issued by the Minister of Education and the Prime Minister. At present, the school is looking for a marker's record which was lost last week. Also, the school has already interviewed a primary school teacher to work at the school. The school only teaches the new (of the) books at all stages.

At this time of year, students study twenty-four seven (day and night) in order to pass the secondary school examination. Before the exam starts, the notes inspector makes sure that the students have not brought any extra material with them. The students are advised to drink a glass of juice and to have an apple pie before the exam. Female students described the chemistry exam to the physics teacher, who works as a science coordinator of the school, as bittersweet due to the ease of the questions on the one hand, and the lack of time on the other. Following the exam, the head invigilator found a girl's book, a boy's cap and a teacher's pen on the floor so he was angry. Consequently, he asked the cleaner to remove them and return them back to the head invigilator's car.