A Prosodic Account of Negation in Jordanian Arabic

DOI: https://doi.org/10.33806/ijaes.v23i2.462

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Received on 21.9.2022 Accepted on 11.3.2023 Published on 20.6.2023

Abstract: This study investigates the relationship between negation variation in Jordanian Arabic and prosody. Inspired by a variationist study (Sallakh 2021) which found that transitivity and tense had major effects on the choice of negation variants in Jordanian Arabic, we provide phonological and acoustic analyses of tokens involving transitive and intransitive verbs. Our results show that intransitive verbs are more likely to occur in discontinuous negation ma:- -ʃ because the verb is not prosodically parsed with a complement. On the other hand, transitive verbs tend to take pre-verbal ma: since the verb is prosodically parsed with its complement hence disfavoring the addition of another syllable to the MiP of the verb and its complement. Similarly, our phonological and prosodic analyses show that tense also affects negation variant choice as discontinuous negation is more frequent in past tense because it does not have any tense or agreement proclitics or enclitics. Present tense disfavors discontinuous negation because of the proclitics and enclitics it is attached to. Finally, to support the prosodic analysis, we conducted an acoustic analysis that investigated negator duration, pitch, intensity inter alia.

Key words: acoustic analysis; Jordanian Arabic; morphosyntactic variation; negation; prosody

1. Introduction

As a phenomenon of semantic opposition, negation has attracted the attention of language scholars as it is necessary in every human language (e.g. Watanabe 2004; Falaus 2007; Zeijlstra 2007). Second, the cross-linguistic evidence shows that its expression is variant Miestamo (2007). In the linguistic domain, negation was found to be constrained by the 'principles and parameters' that govern language processing. For this reason, scholars have approached negation from logical, morphological, syntactic, semantic, phonological, acoustic, social perspectives, and/or a combination of these. One interesting concern in these investigations relates to why negative statements are psychologically more complex and harder to process than affirmative statements (Tian and Breheny (2016). Two main intertwined factors are relevant here: (1) there is cross-linguistically variation as to where the negative marker is placed, and (2) there is variation as to the number of the negative markers used to perform negation.

Languages differ with respect to the position of the negative marker(s) whether it is used to negate certain parts of the sentence or negate the entire sentence

or clause. While some place it before the main verb (e.g. Arabic), others place it after (e.g. Turkish) or use a circumfix (before and after the main verb, e,g, French)

(1) a. Leila lam tanam lajlata ams
Leila neg sleep night yesterday
'Leila did not sleep last night'

b. Bu benim kitabım değil.
This my book not
'This is not my book'

c. Je **ne** sais **pas**
I **NEG** know **NEG**
'I don't know.'

Jordanian Arabic (henceforth JA) uses the three forms: preverbal (2a), post-verbal (2b) and discontinuous 'circumfixes' (2c) with basically no difference in meaning:[1]

(2) a. Omar **ma**: b-ji-ʕraf ji-ħki ʔiŋgli:zi[2]
Omar **NEG** ASP-IMPRF-know IMPRF-speak English

b. Omar b-ji-ʕraf-i**ʃ** ji-ħki ʔiŋgli:zi
Omar ASP-IMPRF-know-**NEG** IMPRF-speak English

c. Omar **ma**[3] bi-ji-ʕraf-i**ʃ** ji-ħki ʔiŋgli:zi
Omar **NEG** ASP-IMPRF-know-**NEG** IMPRF-speak English

'Omar does not know how to speak English.'[4]

It might seem prima facie that one can use any of these forms to negate a clause when, in fact, this is not the case at all. To illustrate, while imperfective verbs sanction the three negative variants (see 2 above), perfective verbs allow only the preverbal and discontinuous variants. Therefore, the post-verbal form is never attested with perfective verbs.[5] Compare (2b) above to (3) below:

(3) *Omar ʕirf-i**ʃ** ji-ħki ʔiŋgli:zi
Omar IMPRF:know-**NEG** IMPRF-speak English
'Omar did not know how to speak English.'

The ungrammaticality of (3) suggests that the imperfective verb is different from the perfective with regard to negation.[6] A number of scholars (Al-Qassas 2012; Hellmuth 2018, 2020) tried to account for the difference in the negator position from various perspectives (see section 2.1 below). In this current research, we will show that the phenomenon can be accounted for from a phonological perspective that basically orchestrates the relevant prosodic parameters/constraints for choosing any of the three forms in the imperfective case and the preverbal and discontinuous variants with perfective verbs in JA.

To the best of the researchers' knowledge, no single study has investigated the difference between negative particles and negative structures in JA from a

prosodic account. Therefore, the aim of the study is to show the relationship between prosody and negation variants in JA. The study also shows how transitive and intransitive verbs are prosodically related to negative particles: discontinuous negative particles occur more with intransitive verbs, while the preverbal negative particle goes more with transitive verbs. Finally, we provide an acoustic account to see if it supports the prosodic account.

This paper proceeds as follows. Section 2 provides a survey of previous pertinent literature on prosody in Arabic and in JA in specific. Section 3 presents the methods and procedures that we followed in data collection and analysis. Sections 4 & 5 present the results of our prosodic and acoustic analyses of negation variants in JA. Section 6 concludes with some suggestions and recommendations for future research.

2. Background

2.1 Prosody in Arabic

To the best of the researchers' knowledge, no single study has as yet investigated the prosodic ramifications of negation or syntax-prosody/phonology interface when negating in Arabic. Hellmuth (2016: 75) stated that "despite an abundance of research on Arabic syntax and phonology as separate domains, there is as yet relatively little research at the syntax-phonology interface in Arabic." The scarcity of studies on Arabic syntax-phonology interface could be due to the complexity of such area of research. Hellmuth (2016: 76) admits that "interface work is complex, and requires expertise, not just general skills, in both syntax and phonetics/phonology."

Thus, prosody was relegated to only a marginal role in most previous research on Arabic syntax and/or phonology (Salem 2003; Lassadi 2005; Aoun, Benmamoun & Choueiri 2010; Soltan 2010; Alsalem 2012; Hoyt 2014; Murphy 2014; Mrayat 2015), but was given more attention in studies that show dialectal variations (Hellmuth 2004, 2006, 2007, 2016, 2018, 2020; Yasin 2012; Jaradat 2018; Al-Shawashreh, Jarrah, Omari & Deaibes 2019; Bani Younes and Hellmuth 2020).

Very few studies have combined the two domains together. These studies (e.g. Bani Younes and Hellmuth 2020; Hellmuth 2020) show the importance of relying on prosody to seek alternative answers/explanations for syntactic phenomena in Arabic. Readers interested in the syntax-prosody interface in Arabic in general can refer to Hellmuth (2004, 2007) on mapping between syntactic and prosodic structure in Egyptian Arabic (EA), Hellmuth (2016) on edge marking cues, Yasin (2012) on edge marking in wh-structures in EA and JA, Al-Shawashreh, Jarrah, Omari & Deaibes (2019) on prosodic account for wh-movement in JA.

2.2 Prosody of JA

The main realization of prosody at the lexical level is primary stress. Brame (1974), De Jong and Zawaydeh (1999) and Al-Jarrah (2002), Bani Younes (2020) among others, found that stress in JA is usually placed on the final superheavy syllables, on the penultimate if it is heavy, otherwise on the antepenultimate syllable.

However, Bedouin JA dialects such as Wadi Rumm and some Bedouin dialects in North-East Badia, as well as some other JA dialects exhibit iambic patterns (CV'CV) (Sakarna 2002; Mashaqba 2015; Mashaqba and Huneety 2018; and Huneety Huneety, Mashaqba, Abu Hula, and Thnaibat 2021). More importantly, De Jong and Zawaydeh (1999) found that stressed syllables are lengthened, their F0 is modestly increased and their intensity boost is strengthened.

Jaradat (2018: 44) claims that "the prosodic word (ω) is not only the domain of stress assignment in lexical and some function words, but also the domain of primary stress assignment in special grammatical structures". Jaradat points out that lexical words can have their own ω's. However, only function words that meet the minimality requirement condition, i.e. bimoraicity, (Al-Jarrah 2002) can have their own ω's and receive stress. According to Jaradat, function words that contain a super-heavy syllable and disyllabic functions words containing a super-heavy or heavy syllable are ω's. Other function words do not receive stress because they do not satisfy the minimality requirement. Jaradat (2018: 45) states that such "function words neither project ω's, nor receive stress. Moreover, they are not affecting the stress of neighboring words." While Jaradat describes the prosody of function words in Irbid Arabic (a dialect spoken in the Irbid metropolitan area in the north of Jordan) in relatively accurate terms, he missed one point regarding the negator *ma:* (not) which according to him is not ω and thus cannot receive stress. In our current research paper, we will bring some acoustic evidence to show that *ma:* in pre-verbal negation in JA receives sentence main stress, but its other variant *ma* which occurs in discontinuous negation does not receive sentence main stress because this variant falls in the same prosodic word. Put differently, because *ma:* is composed of two moras, it can stand on its own right as a prosodic word (hence it satisfies the minimality requirement condition), whereas *ma* consists of only one mora, and thus does not qualify to count as a prosodic word on its own right. Therefore, it is parsed with the following word and may receive main stress by competing with the other syllables in the word.

At the post-lexical level, stress shifts from one constituent to another depending on the part(s) that the speaker wants to emphasize or focus on (El-Hassan 1990; Mitchell 1993; Nolan 2006). Consider the following examples (Boldface expresses the focused elements in the utterance)[7]:

(4) a. ʃufit **ze:d** ʔimba:riħ
b. ʃufit Zeid **ʔimba:riħ**
c. ʃufit ze**:**d ʔimba:riħ
saw.1SG Zayd yesterday
'I saw Zayd yesterday.'

In their prosodic analyses of Φ boundaries in Ammani Arabic (Yasin 2012; Hellmuth 2016) and Irbid Arabic (Jaradat 2018), Hellmuth and Jaradat suggested that "maximal XPs project Φ's in Ammani Arabic (AA) is similar to Egyptian Arabic (EA) (see section 5.1.1). Again, acoustic correlates to Φ boundaries include final lengthening, low and high phrase accents and post-boundary F0 reset" (Jaradat 2018: 75). Similar to AA and IA, JA can be claimed to have the same prosodic domains of phonological phrase in that "minimal Φ's in [JA] match simple XPs

while maximal Φ's match complex XPs (i.e. XPs at the immediately higher syntactic level) for both right and left branching extra-complex XPs" (Jaradat 2018: 213). Analyzing two segmental processes, namely resyllabification and vowel epenthesis, to show edge marking in JA, Yasin (2012) concludes that JA marks the right edge of an XP, a state of affairs that is necessary to our analysis of negation variants to check how prosodic phrasing works in JA verbal negation.

Having presented some of the prosodic and acoustic features of JA, we now present the methods and procedures that we followed in collecting and analyzing the data.

3. Methods and procedures

3.1 The data of the study

This study was sparked by the results of Sallakh's (2021) study on variation in Children's Negation in Jordanian Arabic.[8] The population of her study was all Jordanian children. The sample of that study consisted of 40 Jordanian children who live in different areas in North Jordan in the Irbid metropolitan area. The participants were 20 male and 20 female children from public and private schools. The age range of the children was between 6-11 years old. As our study is not concerned with the *age* and *gender* variables, we will not pursue them here.[9] In addition, since no consents were taken from the children's legal guardians to reuse the data for publication in another paper, the researchers asked 5 adult males (age range 30-40) to produce similar sentences for the acoustic analysis. The participants all speak Jordanian urban dialect. No data were taken from children except the descriptive statistics that shows the speakers preference to use certain negative particles with transitive and intransitive verbs and with perfective and imperfective verbs. The researchers then took median sentences of the five male participants and measured the acoustic features: negation duration, F0, and intensity. Some of these sentences were modified from the children's spontaneous speech collected by Sallakh (2021). Moreover, due to space limitations, the researchers will suffice with measuring one example of each of the acoustic cues.

3.2 Data analysis

Taking the results of Sallakh (2021) as a starting point, we focus on transitivity and tense as they were reported to be key determinants of negation variant choice. We provide a prosodic account for the variationist analysis in the aforementioned study. Additionally, seven tokens of the three types of verbal negation in JA were phonologically and acoustically analyzed using *praat 6.1* (Boersma and Weenink, 2019) to provide the acoustic cues or correlates related to transitivity and tense that might provide a prosodic account that explains the higher frequency of one of the negation variants over the others.

Thus, our study will analyze negative perfective and imperfective transitive and intransitive sentences from prosodic and acoustic perspectives. In specific, the study analyzes transitive and intransitive negative sentences in terms of resyllabification, super-heavy and open syllables. As for tense, the study considers the number of syllables of each word, and vowel reduction in the preverbal negative

particle. Acoustically, the researchers measured negative particle duration, F0, and intensity.

4. Results

4.1 Overall distribution of verbal negation variants in the dataset

The results in Table (1) below show that Jordanian Arabic-speaking children (regardless of gender and age) use pre-verbal negation as the most frequent variant (86.5%) to negate verbal sentences[10]. It has a very high percentage compared with discontinuous (6%) and post-verbal (7.5%) negation variants.[11]

Table 1. Overall distribution of verbal negation variants in the data (Sallakh 2021: 39)

Variant	Example	N	%
Discontinuous	**ma:** ruħt-**iʃ** ʕala mʕa:n *'I did not go to Ma'an'*	72	6
Pre-verbal	**ma:** ba-xa:f min ʔelʕaSfor *'I am not afraid of the bird'*	1032	86.5
Post-verbal	baʕraf-**iʃ** inno EsSi:n bʕi:deh 'I do not know that China is far'	89	7.5
Total		1193	

4.2 Distributional analysis of transitivity and tense

4.2.1 Transitivity

The results in Table (2) show that intransitive verbs are more frequent with discontinuous negation than transitive verbs (5.8% vs 2.5%) (e.g. ***ma**: sa:fart-**iʃ** barra ʔel ʔurdon* 'I did not travel outside Jordan'). By contrast, transitive verbs occur more with post-verbal negation than their intransitive counterparts (10% vs 7.2%) (e.g. *baħib**iʃ** ʔissafar* 'I do not like travelling).[12]

Table 2. Verbal negation variants in JA according to verb transitivity (Sallakh, 2021: 43**)**

Transitivity	Discontinuous		Pre		Post		Total	
	%	N	%	N	%	N	N	%
Intransitive	**5.8**	16[13]	**87**	240	**7.2**	20	276	29.7
Transitive	**2.5**	16	**87.6**	571	**10**	65	652	70.3
Total		32		811		85	928	

4.2.2 Tense

According to the results in Table (3) below, discontinuous negation occurs more with past tense (9.4%) than present tense (1.5%) and it is missing completely in the future tense. Regarding pre-verbal negation, future and past verbs are more frequent with pre-verbal negation than their present counterparts (100% and 90.6% vs 86%) (e.g. *ma: reħ jitfarradʒ ʕa-l-mubara:h* 'He will not watch the match and *ma: tfarradʒ ʕa-l-mubara:h* 'He did not watch the match vs *ma: bijitfarraj ʕa-l-mubara:h* 'He is not watching the match'). Nonetheless all percentages are high and the difference is relatively small when compared to the number of occurrences. Finally, post-verbal negation is only attested in present tense verbs with (12.5%) (e.g. *balʕabiʃ maʕ ʔiwla:d* 'I do not play with boys).

Table 3. Verbal negation variants in JA according to verb tense (Sallakh, 2021: 47)

Tense	Discontinuous		Pre		Post		Total	
	%	N	%	N	%	N	N	%
Past	9.4	23	90.6	222	0	0	245	26.4
Present	1.5	10	86	557	12.5	81	648	69.8
Future	0	0	100	38	0	0	38	3.8
Total		33		814		81	928	

In light of these results, we will analyze these two linguistic factors (transitivity and tense) prosodically and phonologically to see whether negation variants are controlled by them. We will first present a theoretical prosodic account. Then, we will present an acoustic account.

5. Discussion

5.1 A theoretical account

5.1.1 Transitivity

In this section, we will provide an answer to the study's first question: How does prosody help account for the differences between transitive and intransitive verbs in terms of the negative markers each verb tends to take? Transitive and intransitive verbs almost have the same percentage of pre-verbal negation (87.6% vs 87%). However, they differ with discontinuous and post verbal negation. Discontinuous negation was more frequent with intransitive verbs compared to transitive ones (5.8 % vs 2.5%). For instance, discontinuous negation is more likely to occur with the intransitive ***mə*** *Sa:mi****ʃ*** 'he did not fast' than with the transitive ***mə*** *biħibbi****ʃ*** *ʔel-dʒibneh* 'He does not like cheese' although negation is interpreted the same in both sentences. Recall also that the pre- or post-verbal negation conveys the same meaning: ***ma:*** *baħibb ʔel-dʒibneh, and baħibbi****ʃ*** *ʔel-dʒibneh*. This calls for a non-semantic and/or syntactic analysis for negation. In this paper, we show how *resyllabification* and *super-heavy and open syllables* can help solve this issue.

Watson (2007: 61) suggested that the domain of syllabification in SA and most Arabic dialects is the Phonological Phrase, with the result that syllables frequently cross *word* boundaries. Resyllabification, then, applies across word

boundaries within a Phonological Phrase (p-phrase) since a word-final consonant is restructured as the onset of the following syllable in the same p-phrase (Nespor and Vogel 2007).[14]

Resyllabification is a prosodic cue that can differentiate between the use of post-verbal and discontinuous negation. To illustrate, let's take the verb *Sa:m* 'fast'. This verb consists of one prosodic word with one superheavy syllable (CV:C). On the other hand, the discontinuous negation of the previous verb is *mə. Sa:.miʃ* which consists of a function and a prosodic word with three syllables CV.CV:.CVC. Theoretically, the main stress remained on 'Saː' because the circumflex negation did not attract stress: *mə* and *miʃ* do not have long vowels that may attract stress, and they do not occur in a penultimate position.

By contrast, the transitive verb in *biħibb ʔel-dʒibneh* 'loves cheese' is syllabified as follows: *bi. ħib.bil.dʒib.neh* (5a). The main stress lies on the heavy syllable of the verb *ħib*. Due to the resyllabification, the two syntactic words are parsed as one minor phonological phrase since they are two words in one XP (Richards, 2010). However, when adding the discontinuous negation, the phrase becomes ***ma*** *biħibb****iʃ*** *ʔel-dʒibneh.* This phrase has 7 syllables and syllabified as follows: *ma.bi. ħib.bi.ʃel.dʒib.neh* (5b). The insertion of the post-negative form *–iʃ* results in two minor phonological phrases as resyllabification does not apply:

(5) a. [$_{VP}$ [$_{V}$ *biħibb*] [$_{NP}$ *el-dʒibneh*]] syntactic
( ) ω ( ) ω prosodic before syllabification
bi. **ħib.** bil. dʒib.neh
( )p prosodic after syllabification
IMPF-like the cheese
'he likes cheese'

b. [$_{NegP}$ ***ma*** [$_{VP}$ [$_{V}$ *biħibb****iʃ*** [$_{NP}$ *el-dʒibneh*]]] syntactic
( )ω ( )ω prosodic before syllabification
ma.bi.ħib.biʃ el-dʒib.neh
( )p ( )p prosodic after syllabification
NEG IMPF-like-NEG the-cheese
'He does not like cheese'

So, the question arises: why did the addition of the post negation *–ʃ* produce two MiP (minor phonological phrases)? Al-Qassas (2012) suggests that *–ʃ* is a reinforcer. This indicates that, unlike the main negative variant *ma:*, this functional negative variant (*–ʃ*) is optional. Having optional material within the same XP (i.e. VP) results in a prosodically heavier MiP since it adds an extra syllable. Additionally, this extra syllable, produced by a functional clitic, attracts stress. Thus, many speakers would prefer the more *faithful* output to the marked one with an extra syllable, i. e., having a pre-verbal negation variant is more faithful to the input. Having both phonological words (i.e., the verb and its complement) in one XP, without any extra material intervening between them, results in one prosodic phrase as shown in (6) below. It is for this reason many participants preferred the pre-negation to the discontinuous one:

(6) [$_{NegP}$ ma*:* [VP *biħibb*] [$_{NP}$ *ʔel-dʒibneh*]] syntactic
( )ω ( )ω prosodic before syllabification
ma: bi. ħib **bil**. dʒib.neh
( )p prosodic after syllabification
NEG IMPF-like the-cheese
'He does not like cheese'

On the other hand, if a transitive verb is followed by a complement that cannot constitute a MiP with the verb, the reinforcer *–ʃ* cannot be resyllabified and hence cannot attract the main stress of the phrase. Consider (7a) where the transitive verb is followed by a CP as well as (7b-c) where transitive or intransitive verbs are followed by PP adjuncts:

(7) a [$_{NegP}$ ma [$_{VP}$ ba-ʕraf-iʃ [$_{CP}$ eiʃ ka:n biddo]]
NEG ASP-know-NEG what was want:3SGM
'I don't know what he wanted.'

b. [$_{TP}$ [$_{NP}$ Omar [$_{NegP}$ ma [$_{VP}$ ʔakal-iʃ [$_{PP}$ fi-l-matˁʕam]]]]
Omar NEG eat:3SGM-NEG in-the-restaurant
'Omar did not eat in the restaurant.'
c. [$_{TP}$ [$_{NP}$ Omar [$_{NegP}$ ma [$_{VP}$ sabaħ-iʃ [$_{PP}$ fi-l-baħar]]]]
Omar NEG swim:3SGM-NEG in-the-sea
'Omar did not swim in the sea.'

In (7a) *ba-ʕraf-iʃ* and *ʔeiʃ* cannot make a MiP because e*iʃ* starts a CP and thus it is prosodically parsed with the CP complement *ka:n biddo*. In (7b-c) the PP adjuncts are MiP by themselves and thus, cannot make MiP with the preceding verb. Therefore, the reinforcer *-ʃ* does not resyllabify with the onset of the following prosodic word (*iʃ* fi-l-matˁʕam, and fi-l-baħar respectively). This makes the reinforcer *-ʃ* more acceptable in such sentences where the verb is followed by a word that is parsed with what follows than in sentences where *-ʃ* intervenes between the verb and its NP complement, hence blocking resyllabification and results in two prosodic words.

Now, we turn to s*uper-heavy and open syllables.* Arabic has super-heavy syllables (CV:C) which occur word-finally.[15] These syllables attract stress since long vowels are usually stressed in Arabic. Angoujard (1990: 4) proposes the following rules for stress assignment in Arabic: "place stress on the final syllable if it is super-heavy, otherwise place stress on the penult if it is heavy (CVV or CVC), otherwise place stress on the antepenult."[16] It is noticed that Jordanian speakers add the reinforcer *-ʃ* when the prosodic word to which it is attached has fewer syllables; this results in a super-heavy syllable, and no resyllabification occurs.

(8) ma **ra**: ħ**u**:**ʃ** ʕind da:r ʕam-hum
Neg go:PST-NEG at house uncle-their
'They did not go to their uncle's house.'

The verb *ra:ħu* has two syllables and it ends with a vowel that undergoes vowel lengthening word-finally, hence producing a super-heavy syllable with the reinforcer *ra.**ħu:ʃ***. Having such a super-heavy syllable word-finally entices speakers to prefer discontinuous negation to the pre-verbal negation form.

Having a super-heavy syllable with the reinforcer *–ʃ* is also very common with functional words which generally consist of 1-3 syllables. When attached to the reinforcer, they do attract stress:

(9) a. ma **ma.ʕi:ʃ** ʔaj masa:ri
NEG with-me-NEG any money
'I don't have any money.'

b. ma **ʕin.di:ʃ** fikra
NEG at-me:NEG idea
'I don't have an idea.'

c. ma **fi:ʃ** ħada fi-d-da:r
NEG in-NEG person in-the-house
'There is no-one in the house.'

It is very common in JA to say these forms with discontinuous negation as they consist of a super-heavy syllable, hence attracts the hearer's attention and focuses on the negation which presents new information to the proposition.

When looking closely at the examples in (8-9) above, we notice that when a word ends with an open syllable, it is more likely to have discontinuous negation along with vowel lengthening. Compare the verb *jiħki* 'speak' to *jiktub* 'write' in (10-a-b):

(10) a. Omar ma b-jiħ**ki:ʃ** ʔiŋgli:zi
Omar NEG ASP-speak.3SG.M-NEG English
'Omar does not speak English.'

b. Omar ma b-jik**tubʃ** ʔiŋgli:zi
Omar NEG ASP-write.3SG.M-NEG English
'Omar does not write English.'

Many speakers accept *b-jiħ**ki:ʃ*** more than *b-jik**tubʃ*** because the former ends with a superheavy syllable (CV:C) with a long vowel, while the other has a short vowel in the last syllable. In addition, being in a superheavy syllable, the negative marker *i:ʃ* receives a main stress that draws the hearer's attention to the new information in the clause, i.e., the negation of the proposition under question.[17] Though consonant clusters are acceptable in a coda position in Arabic, many speakers prefer to insert a vowel between the last two consonants to ease pronunciation. Therefore, *b-jik**tubʃ*** becomes *b-jik**tubiʃ***. Both forms are disfavored because of the consonant cluster in the first and the addition of an extra (dummy) syllable in the second. As a result, many speakers use the pre-verbal negation variant in such cases more (i.e. *ma: b-jik**tub***).

5.2 Tense

Here, we give an answer to the research second question: How does prosody help account for the differences between perfective and imperfective verbs in terms of the negative markers each verb tends to take? Tense is the second factor that is

reported to affect negation variants in JA (Sallakh 2021). First, pre-verbal negation appears in all tenses with high frequency, while discontinuous negation appears more with past and present tenses but is absent in future tense. For post-verbal negation, it only appears with present tense verbs with (12.5%). Discontinuous negation is more frequent in past tense verbs than in present verbs (9.4% vs 1.5%), and it is not used with future tense. These results, perhaps, support Al-Qassas (2012) in that the negation particle in JA is *ma:* (and its allomorph *ma*) and that *–ʃ* is a reinforcer as it cannot stand alone because of, as we will see, some phonological and prosodic constraints. As for the future, *- ʃ* is not preferred with future tense when the structure contains an overt future particle (such as rəħ/biddi etc.). Due to the high frequency of the pre-verbal negation in all tenses and the slight differences between them all, we will leave this aside. We will focus mainly on the discontinuous negation. Before doing so, let's have a look on the post-verbal negation.

Following Al-Qassas (2012), we consider the post-verbal negation *-ʃ* a reinforcer. Syntactically, this indicates that such a suffix cannot stand on its own in negative clauses. Though this case holds for past and future, it does not hold with present tense verbs:

(11) *a. Omar **liʕb-iʃ** futʿbol imbaːreħ
Omar play:3SG.M-**NEG** football yesterday
'Omar did not play football yesterday.'

b. Omar **bi-lʕab-iʃ** futʿbol
Omar ASP: 3SG.M-play-**NEG** football
'Omar does not play football.'

* c. Omar **reħ ji-lʕab-iʃ** / reħʃ **ji-lʕab**
Omar FUT ASP:3SG.M-play-**NEG** / FUT-**NEG** ASP:3SG.M-play futʿbol bukra
football tomorrow
'Omar will not play football tomorrow.'

The three tense verbs receive the same syntactic account. However, due to some phonological and prosodic accounts, present tense may appear without the main negator as long as there is a negative trace (i.e., the reinforcer). We mentioned that past verbs do not have any prefix in Arabic. Present tense, by contrast, appears with the prefix *bi-* in JA. In future, the future auxiliary *reħ* (will) is used along with the infinitive pattern *ji-fʕal* (do).

Phonologically, the pre-verbal negative variant *ma-* has a bilabial sound *m*. The present tense has a bilabial sound in the onset (*b(i)-*). Due to the similarity in the place of articulation between *m* and *b*, *ma-* is assimilated first to *b*, then deleted because it is peripheral and because it has a negation trace (*-ʃ*). Prosodically, the omission of the pre-verbal negative variant makes it easier to pronounce the word because of the lesser number of syllables. The omission rule cannot apply in the

future tense because *ma-* is always followed by the future auxiliary *reħ* which does not have a bilabial sound in the onset.

This account is supported by two pieces of evidence. First, assimilation may also take place between the imperfective aspectual suffix *bi-* and the next sound if they have some common phonological features. In JA, aspectual *b(i)-* assimilates to plural imperfective prefix *n-,* hence replacing the *b* sound with an *m* which shares the nasality feature with *n*:

(12) b-ni-ħki maʕ baʕaD ⟶ m-ni-ħki maʕ baʕaD
ASP-IMPF-talk.1PL with each other
'We (will) talk to each other.'

In (11b-12), assimilation takes place between the aspectual *b(i)-* and a preceding or following functional sound, thus resulting in a progressive assimilation in (11b) and a regressive one in (12).

Second, we argued that a phonological constraint like assimilation and/or replacement is responsible for the omission of the pre-verbal negative variant *ma-* in present tense. This indicates that if the present tense starts with a non-bilabial sound, assimilation is blocked and thus *ma-* does not get deleted. This prediction is borne out because in some Gulf Arabic there is no aspectual *b(i)*: all present verbs start with the imperfective prefixes (*ji, ti-,ni, ʔa*). Therefore, no progressive assimilation takes place, and the pre-verbal negative variant *ma:-* holds:

(13) ma: ji-ktib, ma: ti-ktib, ma: ni-ktib, ma-ʔaktib
NEG IMPF:3SG.M-write, NEG IMPF2SG.M-write, NEG:IMPF:1SPL-write,
NEGIMPF:1SG.-write
(He/She/We/I do(es)n't write).

There remains one more issue to discuss here: what if the past tense verb starts with a bilabial? Does assimilation and/or replacement take place? Let's take the following example:

(14) a. Omar ma ballutˁ-ʃ es-sa: ħa
Omar NEG tile: 3SG.M-NEG the yard
'Omar did not tile the yard.'
*b. Omar ballutˁ-ʃes-sa: ħa

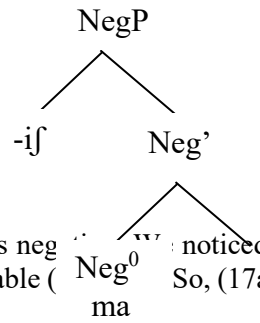
As can be seen in (14b), the omission of the pre-verbal negation particle *ma-* results in the ungrammaticality of the sentence. The reason for that is the fact that

the bilabial *b* in *ballaT* is not functional prefix; it is part of the tri-consonantal root of the verb. This can be stated in the following *negative*-omission rule:

(15) *ma*-omission:
Delete the pre-verbal negative variant *ma-* when it assimilates to the onset of the following functional affix.

Syntactically, Neg^0 may not be spelled out if its specifier is filled as shown in (16) below:

(16)



Now we turn to discontinuous neg[illegible] noticed that it is more frequent with past tense verbs as shown in Table (So, (17a) is more likely to occur than (17b).

(17) a. Omar **ma** **liʕb-iʃ** futʿbol imbaːreħ
Omar NEG play:3SG.M-NEG football yesterday
'Omar did not play football yesterday.'

b. Omar **ma** **bi-lʕab-iʃ** futʿbol
Omar NEG ASP:3SG.M-play-NEG football
'Omar does not play football.'

Prosodically, the present tense has an inflectional prefix (*bi-* in JA and *ja-* in SA). When adding the reinforcer *-ʃ,* present tense verbs have one more extra syllable than their past counterparts (*liʕ.biʃ* vs *bil.ʕa.biʃ*). With discontinuous negation, we will also need to add *ma-* before the verb. Ultimately, the negated present tense will

become prosodically heavier with two extra syllables when one (i.e., the post-verbal) can suffice as we saw earlier.

If we are on the right track, we will expect past tense verbs with more syllables to favor pre-verbal negation and present tense verbs with few syllables to tolerate the discontinuous negation more:

(18) a. Omar **ma** stasˁʕab**iʃ** l-ʔimtiħaːn
Omar **NEG** find hard.PST-**NEG** the-exam
'Omar did not find the exam hard.'
a'. Omar **ma**: stasˁʕab l-ʔimtiħaːn
Omar **NEG** find hard.PST the-exam
b. Omar **ma** bidʒiː**ʃ** badri
Omar **NEG** come:3SG.M-**NEG** early
'Omar does not show up early.'
b'. Omar bidʒiː**ʃ** badri
Omar come:3SG.M-**NEG** early

Indeed, in (18a') the past tense pre-verbal negation is more acceptable as it has one syllable less than its discontinuous negated counterpart in (18a) (*stasˁ.ʕab* vs *stasˁ.ʕa.biʃ*). On the other hand, the present tense discontinuous negation in (18b) is not more acceptable than the pre-verbal counterpart in (18b'), i.e., even when the present tense verb has fewer syllables, it still prefers the post-verbal negation to the discontinuous one. We account for this by the economy rule presented by Chomsky (2000). As long as negation holds with only one particle, there is no need to spell out the other particle.

The second issue we want to discuss here is vowel reduction. Vowel length is phonemic in Arabic and the difference in vowel length results in a difference in meaning (Mitleb 1984). Al-Ani (1992) reports that the relative duration of the Arabic short vowels in medial and final position is (100-150) ms, while for long vowels it is (225-350) ms.

However, in some cases long vowels get shortened/ 'reduced' in JA. (e.g. '*el-dʒa͟mʕaːt el-ʕarabijjeh'* for *' el-dʒa͟ːmʕaːt el-ʕarabijjeh'* "Arab universities"). In the literature, this phenomenon is usually caused by stress clash which could be resolved by stress shift as in English, or is counteracted by removing the stress altogether as in Italian (Nespor and Vogel 2007).

Vowel shortening/ reduction (VR) in JA takes place in phrases that consist of two and only two prosodic words in the same XP. This is best captured by the term MiP, a phrase that is generally composed of two ω's in the same phonological phrase, which was proposed for Japanese (Poser 1984; Kubozono 2003), Korean (Jun 1998), and later adopted for other languages including some Arabic varieties (Hellmuth 2006).[18]

In Egyptian Arabic, for instance, if the superheavy syllable is subject to resyllabification, then vowel reduction is blocked. Compare 19 to 20-b.

(19) ka**laːm** faareɣ [ka.**lam** faa.reɣ]
speech empty
' nonsense'

(20) a. kalaːm l-ħub [Ka.laː.**mel**.ħub]

speech the-love
'love words'

b. *ka**lam** l-ħub

In JA, vowel reduction is seen mainly with functional words and VR is usually compensated by other syllables. For instance, the preposition *fi:* ends with a long vowel. This vowel undergoes reduction when followed by another word that starts with the prefixal definite article. Resyllabification applies, hence making the *–l* of the definite article the coda of the new syllable.

(21) a. Omar **fi**: beit ʕammu-h
Omar in house uncle-his
'Omar is at his uncle's house.'

b. Omar **fi-l**-beit
Omar in-the-house
'Omar is in the house.'

In discontinuous negation, the pre-verbal negation particle *ma:* undergoes VR when adding the reinforncer *ʃ*. Consider (22a-b):

(22) a. Omar **ma**: liʕib futʿbol ʔimba:reħ
Omar **NEG** play:3SG.M football yesterday
( )ω ( )ω
'Omar did not play football yesterday.'

b. Omar **ma** liʕib-**iʃ** futʿbol ʔimba:reħ
Omar **NEG** play:3SG.M-**NEG** football yesterday
( )ω
( )MiP

Vowel reduction here is triggered by the fact that negation is functional. Discontinuous negation indicates having two negative particles in two different places. Due to the functional nature of negative particles, one may, at most, receive a main stress. The long vowel in *ma:* undergoes VR when adding the reinforcer in order not to affect the main stress of the word. So, in (22b) above, the main stress falls on the penultimate syllable ʕi. It is also possible to pronounce the verb and the reinforcer with two syllables *liʕ. biʃ.* Even in this case, the main stress falls on the penultimate syllable *liʕ*.

In the case of having a verb that ends with a vowel, the last syllable undergoes vowel lengthening, when adding *-ʃ,* in order to have a super-heavy syllable that attracts main stress. So, in *Omar **ma** bi.dʒi:ʃ badri* 'Omar does not show up early', the main stress falls on the last super-heavy syllable that is composed of the verb's second lengthened syllable and *-ʃ.* Because the reinforcer, the negative suffix, became the coda of the stressed syllable, *ma*, the negation particle, undergoes VR.

5.4 An acoustic account

In this section, we try to find if acoustics supports the prosodic account of the relationship between negation in JA on one hand and transitivity and tense on the other. Languages show much more variation in prosody than in syntax. Even

dialects of the same language show many acoustic differences in word stress, pitch accents and prosodic contours (Hellmuth 2016). Some of these cues maybe peculiar to certain languages or dialects while others may tend to have universal nature (Kiparsky 2006).

Literature on prosody suggests that there is a universal tendency for the right edges of prosodic phrases to be demarcated by certain types of acoustic cues such as lengthening of the final stressed syllable of the phrase, presence of a pause at the locus of the boundary, and a fall in amplitude (Vaissière 1983; Gussenhoven 1991; Hayes 1995; Endress and Hauser 2010; Abdelghany 2010).[19] These cues have been shown to facilitate boundary identification for hearers. Cross-linguistically, pauses and lengthening are robust cues for Intonational Phrases (Nespor and Sandler 1999; Malaia, Wilbur and Weber-Fox 2009; Tang, Brentari, González and Sze 2010).

For our study, *Praat* is used to analyze three acoustic cues: negation duration, F0, and intensity. It is important here to mention that the speakers' measurements were recorded when they sounded natural, i.e. the speaker was not exaggerating pronunciation, lengthening or shortening. Although one can produce the same phrase different times with different temporal reading, the point here is to see if the different between *ma:* and *ma* was noticeable. These measures will help find the differences between negated transitive and intransitive present and past verbs. The analysis will be focused on preverbal and discontinuous negation forms. The sentences that we analyzed acoustically were produced by five adult male speakers. The researchers took median sentences of the participants and measured the acoustic features. As mentioned earlier, due to space limitations, we will measure one example of each of the acoustic cues.

First, in terms of length of the negative variant, the preverbal negator *ma:* was much longer than that in the circumflex negation *ma* ((270 vs 150 msc) as can be seen in Fig (1) and (2).

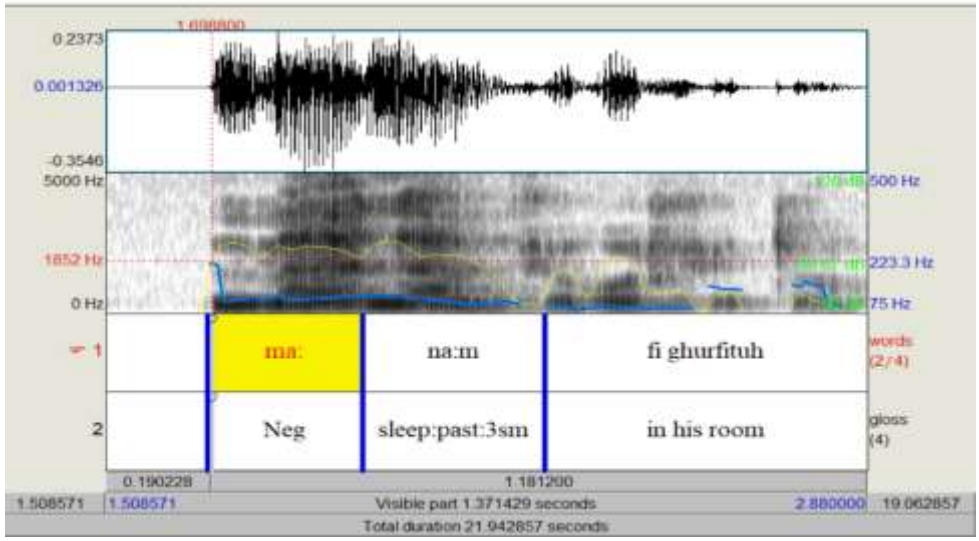


Figure 1. The length of the preverbal negation *ma:*

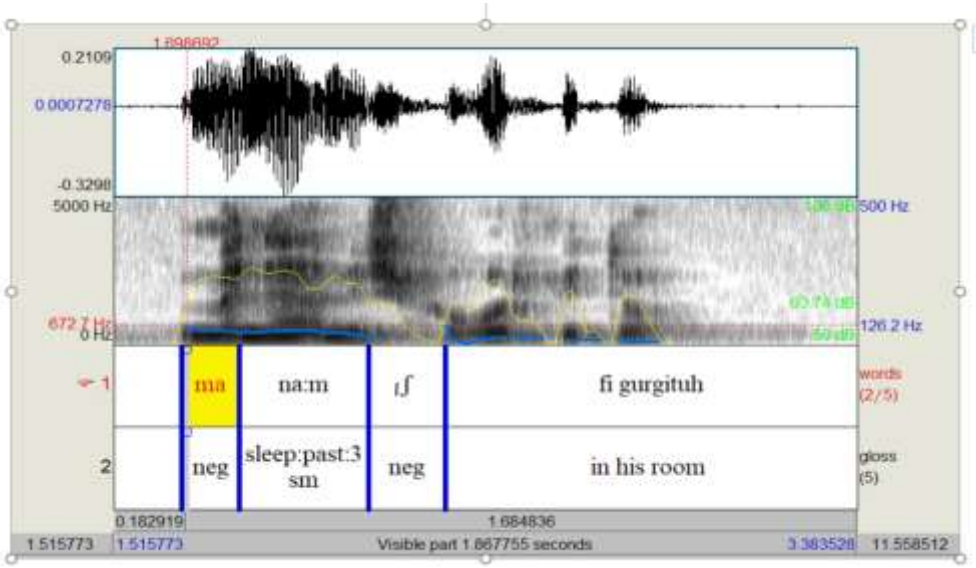


Figure 2. The length of the circumflex negation *ma*

This indicates that the length of *ma* in the circumflex negation has been shortened due to the presence of *-ʃ* whose length was almost 190 (msc).

In terms of pitch (F0) and intensity, it is very noticeable in Fig (1) that *ma:* starts with a very high pitch (223.3 Hz) (indicated with the blue line) and the syllable is very loud (indicated by the yellow line). By contrast, the circumflex *ma* in Figure (2) starts with 126.2 Hz and the intensity is not the highest in the sentence as the verb *na:m* 'sleep' clearly has more intensity. These results are congruent with Horn (2001), Kadmon (2001), and Hirschberg (1993).

As long as the preverbal *ma:* has a high pitch and intensity in comparison with the remainder of the sentence, this indicates that it is stressed.[20] By contrast, the circumflex *ma* does not have the highest pitch and intensity. This indicates that it is not stressed. As argued by Al-Jarrah (2002) and Jaradat (2018), such function words are not considered ω's, and thus cannot receive stress. They are parsed with neighboring words without affecting their main stress.

We turn now to transitivity. We mentioned that intransitive verbs favor discontinuous negation more than transitive ones (5.8% vs 2.5%)[21]. We accounted for that by the fact that transitive verbs tend to take pre-verbal *ma:* since the verb is prosodically parsed with its complement hence disfavoring the addition of another syllable between them. By contrast, intransitive verbs are more likely to occur in discontinuous negation *ma- -ʃ* because the verb is not prosodically parsed with a complement. Now let's see if there is any acoustic evidence for this claim. First of all, if we look back at Fig (1&2), we notice that with the intransitive verb *na:m* 'sleep', there was no reset for F0 with the preverbal negation *ma:* as the pitch has hardly raised after the verb. On the other hand, with the addition of *-ʃ* in Fig (2), there was a reset of pitch at the end of the verb which has a very low F0 value of 75 Hz, whereas it raised to 120 Hz with the introduction of the PP complement *fi ghurfituh* 'in his room'. This value (120 Hz) is very close to F0 value at the

beginning of the clause (126.2 Hz). This indirectly indicates that the post-verbal negator -ʃ has been parsed with the verb.

We, now, move to a transitive verb to see the effect of -ʃ. We assumed that the verb and its complement are parsed together and thus they disfavor the addition of any extra material (i.e., -ʃ) between them. Let's have a look at Fig (3&4) which show a transitive verb used with preverbal and discontinuous negation respectively.

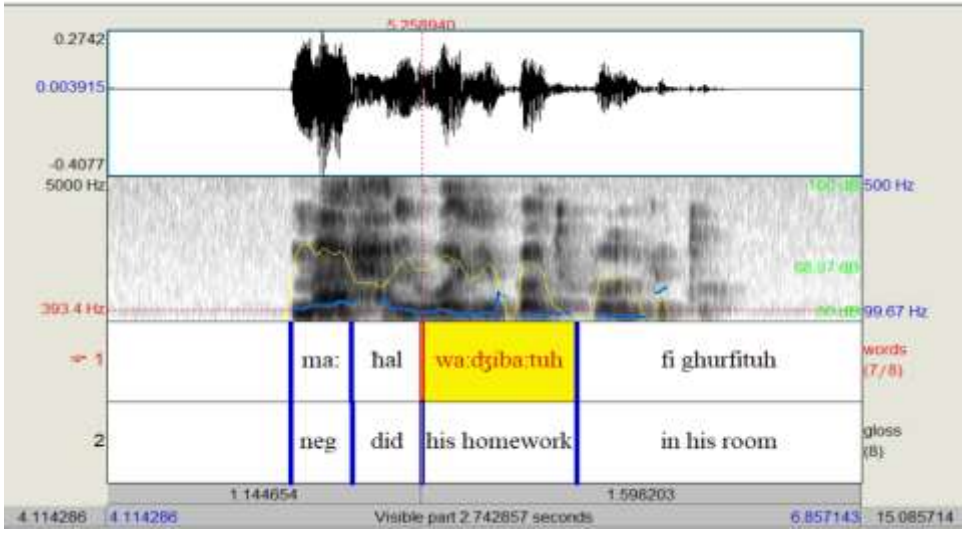


Figure 3. Pitch and intensity of a transitive verb in a pre-verbal negation

Fig. (3) shows that in the preverbal negation, the pitch of the verb and its complement were not affected as there was no pitch reset (F0=99.67 Hz at the end of the verb and the beginning of the complement). Intensity was not affected either (the verb is 67 dB and the complement is 67.35 dB). Again this proves that the verb and its complement are prosodically and acoustically parsed together.

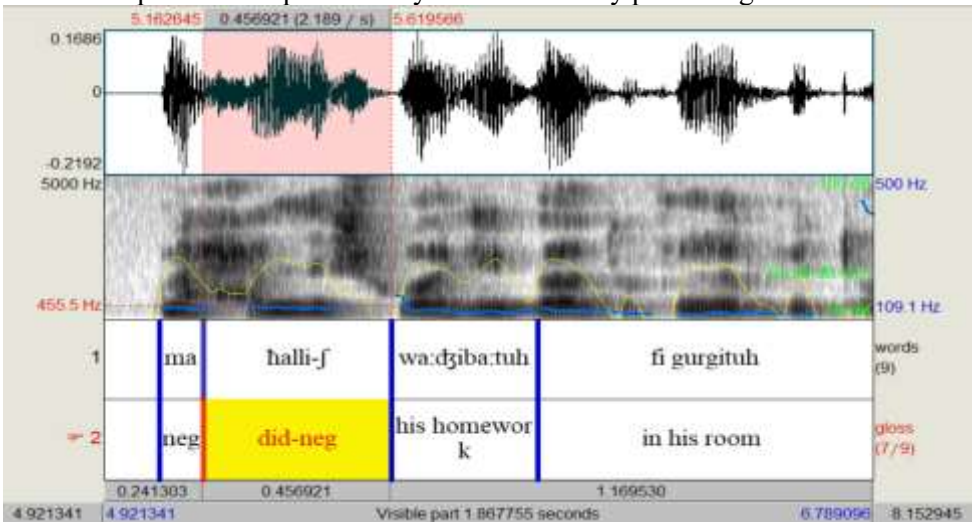


Figure 4. Pitch and intensity of a transitive verb in a circumflex negation

On the other hand, Fig (4) shows that in the circumflex negation, the pitch of the verb and its complement were affected as there was a pitch reset (F0=109.1 Hz at the end of the verb), and (145.4 Hz) at the beginning of the complement *wa:ʤiba:tuh* 'his homework'. Intensity was affected as well (the verb is 65 dB but its intensity decreases sharply, while the complement has intensity reset. This indicates that the verb and its complement are no longer parsed together. Instead the introduction of *-ʃ* broke the MiP parsing and resulted into two MiPs: one for the verb along with the post-verbal negator, and one for the complement by itself.

We finally move to see if tense acoustically affects the negation form used. The results in Table (3) show that post-verbal negation is only used with present tense. Therefore, we cannot hold a comparison with other tenses. Furthermore, past tense clearly favors discontinuous negation (9.4% for past tense vs 1.5% for present tense). We accounted for that by the fact that discontinuous negation is more frequent in past tense because the verb does not have any tense or agreement proclitics or enclitics. By contrast, present tense disfavors discontinuous negation because of the proclitics and enclitics it is attached to. Thus, adding another (negative) morpheme to a root which already has other morphemes would make it prosodically heavier and hence disfavored in present tense.

Fig (5) shows the acoustic features of discontinuous negation in past tense verbs.

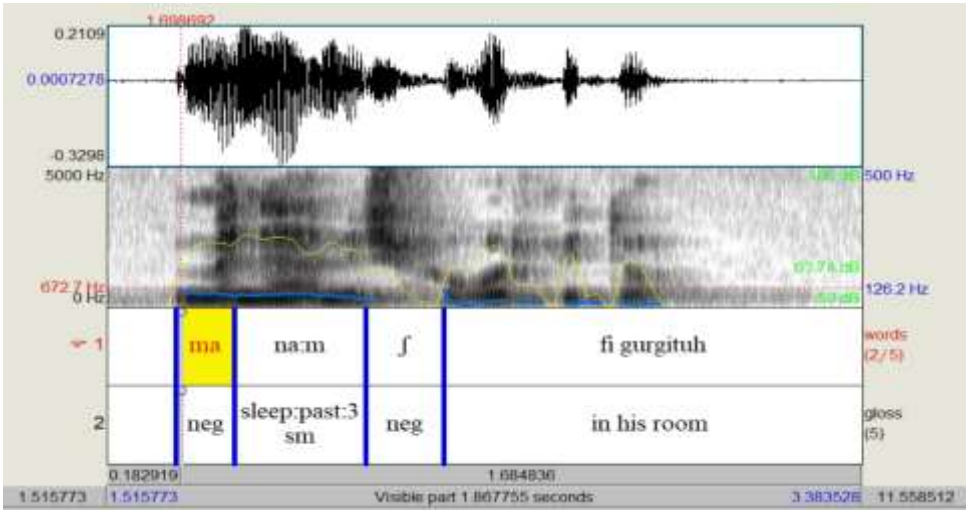


Figure 5. The acoustic features of discontinuous negation in a past tense verb

F0 shows a declining pitch in the discontinuous negation (pre-neg-verb-post-neg) as F0 starts at 126.2 Hz (on *ma*) and declines to 0 Hz at the end of post-verbal negator *-ʃ*. Intensity (in yellow) is also similar: it is high on the verb and the preverbal negator and it declines sharply on the post-verbal negator -ʃ. A pitch and intensity reset is witnessed at the adjunct PP complement. This indicates that the discontinuous negation and the verb form one prosodic unit (i.e. MiP).

On the other hand, Fig. (6) shows the acoustic features of discontinuous negation in present tense verbs.

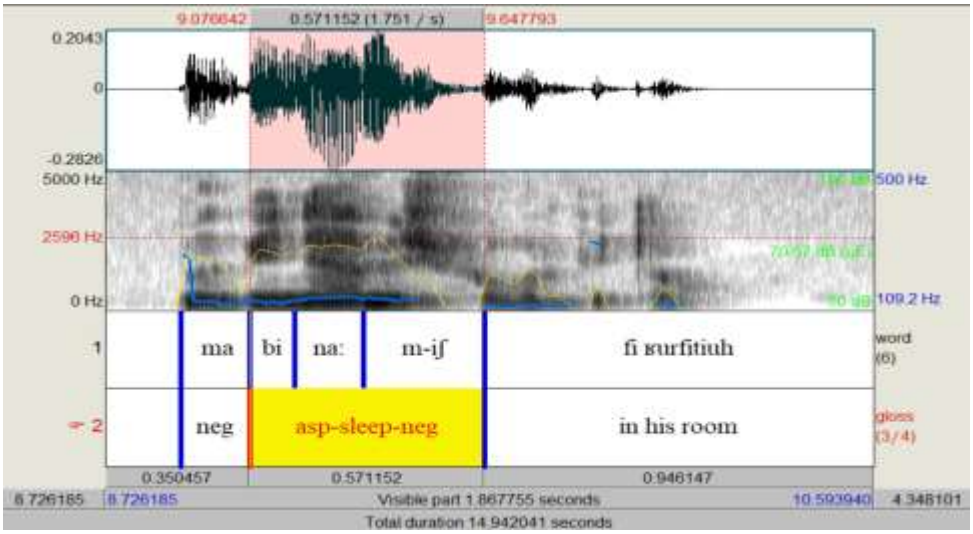


Figure 6. The acoustic features of discontinuous negation in a present tense verb

In the present tense discontinuous negation (pre-neg-verb-post-neg), F0 starts high with 242.3 Hz (on *ma*) and drops sharply afterwards. On the aspectual proclitic *(bi-),* it gets to 102.4 Hz, then it raises to 113.5 Hz on the verb *na:m* 'slept. The pattern is fluctuating (high-low-high). As for intensity, it raises over the preverbal negator *ma* and the verb *na:m* (average = 70.74 dB) and its reaches its peak on the onset of the verb's last syllable (miʃ) (75.84 dB), but it declines sharply on the post-verbal negator *-ʃ*. Similar to pitch, intensity shows a turbulent pattern (low- high-low). In both, pitch and intensity, it seems that the post-verbal negator *-ʃ* is responsible for such turbulence. This may suggest that the discontinuous negation does not create well-parsed prosodic phrases. No pitch reset is seen after the pre-neg-verb-post-neg combination.

We still need to compare the irregular pattern created by the discontinuous negation in the present tense to a present tense verb with preverbal negation (Fig 7):

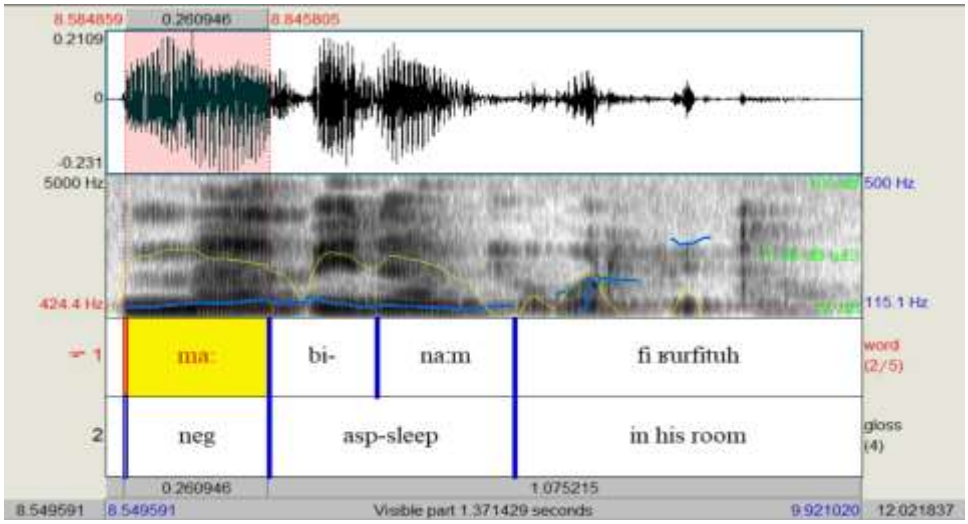


Figure 7. The acoustic features of preverbal negation in a present tense verb

Figure (7) shows two things that make the preverbal negation in present tense more acoustically acceptable: *ma:* and *bina:m* have similar falling loudness patterns (indicated in yellow line). Second, though pitch does not show a clear pattern, there is a pitch reset after the pre-neg- +verb combination. The PP complement clearly has a higher pitch. This suggests that pre-neg- +verb combination makes one prosodic unit (i.e., MiP).

In light of the above, it seems that the acoustic analysis supports the prosodic one. Transitivity and tense do affect the choice of the verbal negation variant as intransitive verbs favor discontinuous negation while transitive verbs favor preverbal negative forms. In addition, past tense favors discontinuous negation more than their present counterparts. In general, our results support Horn (2001), Kadmon (2001), Hirschberg (1993), Hirschberg (1993), and Chiang, W., Chang-Liao and Chiang, F. (2006).

6. Conclusion

This research investigated prosodic and acoustic cues that are at play when choosing a negation variant in JA. The study found that intransitive verbs favor discontinuous negation *ma- -ʃ* as the verb is not prosodically parsed with a complement. By contrast, in transitive verbs the verb is prosodically parsed with its complement, so it tends to take pre-verbal negator *ma:*. Therefore, it avoids the addition of another syllable to its MiP. The prosodic analysis was based on resyllabification, and superheavy and open syllables. As for tense, the phonological and prosodic analyses show that discontinuous negation is more frequent in past tense as it does not have any tense or agreement clitics. Present tense, by contrast, has aspect and agreement proclitics and so it disfavors discontinuous negation. The study also provided a phonological analysis that was based on assimilation between the negator *ma* and the aspectual morpheme. Prosodically, the addition of the post-verbal negator *-ʃ* makes the verb heavier. Past tense verbs, which do not have

aspectual proclitic, can accept such addition, hence appearing in discontinuous negation. In comparison, present tense verbs have an aspectual morpheme and this makes them prosodically heavy. So, they do not tend to have discontinuous negation. Vowel reduction also supported our argument that present tense verbs are more likely to occur with preverbal negation while past tense occurs more with discontinuous negation. Finally, to support the prosodic analysis, an acoustic analysis provided measurements of negator duration, pitch, and intensity that could differentiate preverbal and discontinuous negation variants.

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Endnotes

[1] Historically, there was a major variation between the Arabics of Jordan (see Zuraiq & Zhang 2006; Bani Younes 2020 for more details on the differences between Urban, Rural and Bedouin varieties of Jordan). However, there has been a degree of levelling in recent years. In this paper, we use JA roughly to refer to this kind of leveled dialect represented by sentences reproduced by 5 adult Jordanian males.

[2] We will follow the IPA for transcription here.

[3] It is worth mentioning that sentence stress falls on *ma:* in the case of pre-verbal negation as in (2a). Yet, sentence stress falls on the main verb in the case of discontinuous negation as in (2c). Therefore, in the latter case, the vowel in *ma:* is shortened due to sentence stress shift from *ma:* to the main verb.

[4] All examples cited in the paper, unless otherwise stated, come from the authors.

[5] Imperfective and perfective will be used here as equivalent to present and past tenses respectively. As for the future, it can be manifested with other particles (e.g., rəħ, bidd-i/-na/-hum/kum etc..). Here, we will focus only on future with rəħ' which is followed by imperfective. So, the imperfective will be equivalent to the present only if not preceded by 'reħ'.

[6] This casts doubt on the nature of the post-verbal variant *-ʃ,* and whether it is a real negator or not. Loutfi (2019) considers *-ʃ* as an NPI (Negative Polarity Item) as it cannot occur with another NPI in the same sentence/utterance in Moroccan Arabic. While we have counter evidence that *-ʃ* can co-occur with NPIs in the same utterance in JA, this argument is beyond the scope of the present study. Additionally, following Lucas (2009) and Lucas & Lash (2010), Loutfi (2019) argues that *-ʃ* is historically derived from the Classical Arabic noun 'ʃajʔ' that does not originally denote negation. Loutfi (2019: 48) states:

> [T]he noun 'ʃajʔ' can be used as either a noun denoting a non-referential or quantificational property, as is the case with its counterpart in English 'thing', or as an NPI. The second interpretation seems to be restricted to its co-occurrence with a pure negative marker, hence its status as NPI. In the same vein, Lucas and Lash (2010) show that of the 77 times of the occurrences of the noun 'ʃajʔ', 63 (81.8%) of 'ʃajʔ' always appears in the scope of negation. It should come out as no surprise then that 'ʃajʔ' gradually lost its semantic meaning and developed a purely grammatical function by combining with {ma-}, a process of grammaticalization (Lucas 2009).

As our prosodic analysis in the present study depends on synchronic data from JA, we focus on the current (morphological) status of the negator *-ʃ* rather than its evolution. Therefore, whether or not the argument (i.e., the association of *-ʃ* with the noun 'ʃajʔ' is sound falls beyond the scope of our prosodic analysis. Yet, we do believe that this argument is not without its shortcomings as there are many examples in JA where both *-ʃ* and 'ʃajʔ' can be used in the same sentence/utterance. We leave this issue to a future paper that is dedicated to the evolution of *-ʃ.*

[7] There is still word-level stress on all three elements here and this is different from the intonation level under investigation in these examples.

[8] We depend on the data collected by Mais Sallakh (2021) while she was working on her MA thesis on negation variation in children's speech in Jordan. We also take her variationist results regarding the effects of transitivity and tense on the choice of negation variant as a starting point in order to provide our prosodic analysis.

[9] Sallakh's study was conducted in Irbid City and the surrounding areas in the north of Jordan. The researcher recorded almost 40 hours of digital recordings obtained from

Jordanian children who study in public and private schools in Irbid. In that study, the researcher conducted sociolinguistic face-to-face interviews with the participants. During the interviews, participants were asked questions about different topics such as school days, dreams, and memories. The chosen questions were intended to encourage children to get involved in the interviews and thus speak spontaneously. Then, tokens including negation were extracted from the interviews and then coded according to a number of linguistic factors. All coded tokens were analyzed using GoldVarb X (Sankoff, Tagliamonte & Smith 2005) to determine the factors that statistically affect the choice of negation variant.

[10] Recall that child speech development does not match the adults' performance. However, as mentioned earlier, Al-Sallakh's research was conducted on 6-11-year-old children, i.e. not very young children. Thus, we try here to see if the negation variation recorded in those children's speech can be prosodically motivated.

[11] According to Sallakh's study (2021), there was no difference between male and female children in this regard.

[12] This study is based on descriptive analysis not on a statistical one.

[13] The percentage is calculated by dividing the number of any case by the total number in the same row. For instance, (5.8%) is the percentage obtained through dividing 16 by 276.

[14] As a consequence, resyllabification constitutes a problem for the Strict Layer Hypothesis (Selkirk 1980, 1986; Nespor and Vogel, 2007) since the edges of syllables are not aligned with the edges of prosodic words 'ω'. Abdelghany (2010: 103) states that "resyllabification which is a post-lexical prosodic restructuring results in the formation of post-lexical prosodic words, which differ from the lexically built prosodic words from which they are derived."

[15] Arabic also has another superheavy syllable (CVCC), but this syllable does not attract stress because it has a short vowel.

[16] Angoujard's analysis is true of Standard Arabic, which also roughly applies to Arabic dialects. However, there are many dialects of Arabic that allow different syllable types, e.g. JA allows #CCVC (kta:b 'book'), while Kuwaiti Arabic disallows CVCC# (*qabr 'tomb').

[17] In OT, De Swart (2009) expressed post-verbal negation in a constraint dubbed as 'FocusLast'.

[18] However, Hellmuth suggests that the constraint on the size of the MiP may be looser in Semitic languages.

[19] Certain phonological phenomena such as assimilation and deletion do not occur over certain boundaries, but may occur over others.

[20] This does not exclude the fact that the verb *na:m* 'sleep' is also stressed as indicated by its high pitch and intensity.

[21] No statistical analysis was conducted to see if the difference is significant or not. However, the difference is intuitively interesting to study.

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