Intonational Phrasing in Modern Standard Arabic with Reference to English

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Abstract
This study tries to investigate the intonational phrasing in Modern Standard Arabic sentences. Intonational phrasing is the process of dividing an utterance into meaningful groups of information. Each group is separated from the other by certain intonational cues at specific positions within the utterance. Focus is made on how the Arabic sentence structures “subject-verb-object (henceforth SVO)” and ‘verb-subject-object (henceforth VSO) are phrased and the factors determining their grouping into sets of information. This is carried out through discussing 7 Arabic target sentences, 4 are of SVO structure and 3 are of VSO. All the target sentences have various internal structures concerning the length of both the subject and object in different positions. The target sentences are read by 8 candidates who are selected on the basis of being professional college teachers of Arabic in the Department of Arabic in College of Arts in the University of Mosul. The performance utterances are recorded and analyzed in order detect the main factors that influence the intonational phrasing in Arabic sentences.

Introduction
Intonational phrasing is an important process in dividing the utterance into more than one group. Each group contains a specific structure. The phrasing process is very much likely to occur in long sentences which are both prosodically heavy and syntactically complex. The current study aims to investigate the intonational phrasing in MSA sentences and the factors influencing it. Different factors can be at play in phrasing concerning the syntax, meaning, or balance in the size of the phrased unit. The study also examines the distribution of various intonational cues used in dividing the sentence into certain intonational groups of specific structure.

The study examines many hypotheses. First, there is no specific limitation for the size of the internal structure of the MSA sentence in being phrased into phonological groups. The longer the sentence is, the bigger the likelihood to be phrased into smaller unit of correctly syntactic structure. The study also hypothesizes that the SVO sentence structure tends always to be intonationally phrased as (S) VO rather than (SV) O even if the subject and object have similar phonological structure. In the case of VSO structure, the sentence is very much likely phrased into (VS) O. The third hypothesis states that a certain
group of intonational cues determines the location of the intonational boundaries in the utterance.

The current study consists of three main sections: The first section opens with giving a preliminary of the main notions relevant to intonation and intonational phrasing. This section also tries to demonstrate the main theories that discuss intonational phrasing in so far as it can be influenced by syntax, meaning, or anything else. This section also examines the previous studies of intonational phrasing in Arabic, especially the Cairene Arabic carried out by Hellmuth (2004, 2007, 2012, and 2014). Then a notation that sketches the production of each utterance from the data is proposed.

Section Two discusses how the data are collected through selecting specific Modern Standard Arabic (henceforth MSA) target sentences pronounced by a group of college teachers from the Department of Arabic in the College of Arts. Each production is analyzed syntactically and then intonationally through making an auditory transcription for each produced utterance with reference to fundamental frequency levels and pitch contours using Praat 4.2 Program (Boersma & Weeninck 2004). Section Three is a conclusion that shows the main results approached in the study.

1.1. Intonation:

Intonation has been given several definitions according to its purpose in speech. t’Hart et al (1990: 10) define intonation as an “ensemble of pitch variations in the course of an utterance”. This perceptual impression of speech melody correlates, to a first approximation, with changes in the fundamental frequency (Fo) of the signal. These Fo variations, in turn, reflect changes in the rate at which the vocal cords vibrate. Therefore, if intonation is approached from a phonetic angle, its form of appearance can be described in perceptual, acoustic and physiological terms. Wennerstrom (2001: 17) relates pitch to intonation as conveying meaning and says that intonation is the pitch or “melody” of voice during speech adding that speakers, extensively using intonation, can manipulate their pitch on particular words, phrases, or even topic-sized constituents to convey meaning about relationships in discourse. The significant role played by intonation in achieving communicative purposes among people is emphasized by Nolan (2006: 433) in considering intonation a means for conveying information in speech which is independent of the words and their sounds focusing heavily on the modulation of pitch over the domain of the utterance. These definitions focus on the pitch modulations of variations as a cornerstone element in describing intonation as a suprasegmental system independent but imposed on the segmental elements, i.e. consonants and vowels. Manipulating the pitch variations, speakers are able to achieve successful
communication as to express their feelings and attitudes in certain contexts where intonation is a decisive agent in fulfilling this goal. Roach (2009: 430) recognizes intonation as “variations in the pitch of a speaker’s voice used to convey or alter meaning”. He adds that intonation is described as representation of pitch movements and levels through which emotions and attitudes are signaled and expressed. O’Grady (2010: 3) refers that intonation has the role of helping to segment a stretch of speech into meaningful utterances and to highlight the unity of segmental unit of speech.

1.2. Intonational Structure:

The intonational structure, according to Selkirk (1984: 197f.), involves three things.

"First, it involves the intonational phrasing of the sentence: the division of the sentence into one or more intonational phrases. An intonational phrase is a unit of prosodic constituent structure with respect to which the characteristic intonational contours of a language are defined.... Second, the intonational structure of a sentence involves the assignment of pitch accents (prominence) to the words of the sentence.... Third, the intonational structure involves the representation of the particular intonational contour of each intonational phrase (tones). (Words in brackets are ours)."

This division of intonational structure is on a par of Halliday’s notion as “a trio of systems operating in English intonation.” (1970: 159) According to Halliday, the intonational structure consists of: first, "tonality" that segments a stretch of spoken text into a series of discrete units of intonation which correspond to the speaker's perception of pieces (or chunks) of information, Second, "tonicity" which is the system by which an individual, discrete, unit of intonation is shown to have a prominent word that indicates the focus of information. Third, "tone" which is the system of contrasting pitch movements in each unit of intonation, among other things, identifies the status of the information, e.g. major, minor, or complete.

1.3. Intonational Phrasing:

Intonational phrasing, according to Wang and Hirschberg (1992: 186), is the structure that "divides an utterance into meaningful 'chunks' of information". Variation in phrasing can change the meaning hearers assign to tokens of a given sentence. For example, an interpretation of a sentence like

(1) Bill doesn't drink because he's unhappy.

will change, depending upon whether it is uttered as one phrase or two. If uttered as a single phrase, this sentence is commonly interpreted as conveying that Bill does indeed drink but the cause of his drinking is not his unhappiness. Thus, the phrase boundary "//" will be located at the beginning and at the end of the utterance, as
in (2).

(2) //Bill doesn't drink because he's unhappy//
If uttered as two phrases, it is more likely to convey that Bill
does not drink and the reason for his abstinence is his unhappiness,
and the boundary will thus be positioned between the words "drink"
and "because" forming two intonational phrases, as shown in (3):

(3) // Bill doesn't drink // because he's unhappy//

Another definition is given by Tench (1996: 31) who considers
intonational phrasing “a system in intonation that divides spoken
discourse into its separate individual intonation units.” He adds that
each unit bears a single piece of information and represents the
speaker's management of the information of the whole message.

(Wennerstrom, 2001: 28) asserts that intonational phrasing refers to a
more or less continuous pitch contour with, at minimum, an initial
key, a number of pitch accents, and a pitch boundary. Watson and
Gibson (2004: 714) consider the intonational phrase a "prosodic unit
of speech that contains at least one syllable that receives phrasal stress
(pitch accent) and ends with a boundary tone." They add that
intonational phrases are often, but not always, separated by pauses,
and the final word of the phrase tends to be longer than the same word
that would be in a phrase-medial position.

1.3.1. Factors Determining Intonational Phrasing:

Intonational phrasing is influenced by many factors, namely,
semantic and pragmatic/discourse factors such as focus and old/new
information, by phonological factors such as rhythm and phrase
length, and by a performance related factor such as speech rate (Jun,
731) argued that intonational phrase boundaries in an utterance are
subject to a semantic well-formedness constraint called the “Sense
Unit Condition (SUC)”. The SUC states that heads that do not have a
dependency relationship cannot occur together in an intonational
phrase. Formally, Selkirk defines the SUC as follows:

(4) The Sense Unit Condition of Intonational Phrasing:

“The immediate constituents of an intonational phrase must
together form a sense unit.”

One important implication of the SUC is that semantically related
words tend to be grouped together in the same intonational phrase
while semantically unrelated words tend not to be. Ferreira (1988,
mentioned in Watson and Gibson, 2004: 717) hypothesized that both
syntactic structure and semantic structure play a role in intonational
phrasing. Ferreira hypothesized that breaks occur in sentences such
that the resulting units are as semantically coherent as possible,
defining coherence as having a minimal number of dependencies
across units. She adds that semantically coherent objects are easier to
maintain in working memory, and preserving the semantic coherence within an intonational phrase facilitates comprehension for the listener. Watson and Gibson (2004: 715) assert that intonational phrasing is influenced by the semantic and pragmatic factors in addition to focused words and new words that tend to have phrasal stress, and that stressed words can mark the end of intonational phrases. For example, if someone answers the question (5a) may have the answer in (5b):

(5)  a. When was Mozart born?
    b. In //JANUARY SEVENTEEN FIFTY SIX//

recognizing the bracketed phrase, i.e. the date as a new piece of information for the hearer who posed the question. However, if the same response was said to

(6) Was Mozart born in January 1756 or in February 1756?

the answer will be

(7) In //JANUARY// seventeen fifty six.

focusing on the sole new information, namely, "January", as the focus structure.

Other factors that influence the intonational phrasing are the syntactic structure of sentences. For example, asides, non-restrictive modifiers, sentential adverbs, vocatives, and parentheticals also seem to require their own intonational phrase, as can be shown in (8) below.

(8)

a. Separate Clauses:
   //The professor whom the students liked // taught the class //
b. Asides:
   // Tony // as you know // can’t take care of himself //
c. Vocative
   // Take out the trash // Carmela //
d. Non-Restrictive Modifiers
   // David // who works at a power plant // caused an accident //
e. Sentential Adverbs:
   // Generally speaking // the chairman succeeded in running the crisis //
f. Parenthetical Clause:
   // The books // some have claimed // have not arrived yet //
g. Multiple Intonational Phrasings for the Same Syntactic Structure:
   1. // John // gave the book to Mary //
   2. // John gave the book // to Mary //
   3. // John // gave the book // to Mary //

(Watson and Gibson, 2004: 714ff.)

It can be inferred from the above examples that the syntactic factor plays a significant role in determining the intonational phrasing boundaries. Gussenhoven (2004: 159) and Gussenhoven and Jacobs
(2011: 249) stress three factors that are likely to determine the intonational phrasing. First, prosodic constituents tend to have their right or left edges coincide with the corresponding edges of specific morpho-syntactic constituents. Second, many languages require the left or right edge of the focus constituent, roughly the ‘new information’, to coincide with some prosodic constituent. Third, the length of prosodic constituents tends to be less variable than that of morpho-syntactic constituents, which is due to size constraints on prosodic phrases. In (9), the same sentence can have more than one phrasing. (The words embraced between the small brackets form one unit.)

(9)  
   a. // The first // train to // arrive is the // one from Paris //  
   b. // The first train // to arrive // is the one // from Paris //

In (9a), it would be unexpected to have a break to occur between "first" and "train", between "to" and "arrive", and between "the" and "one", whereas (9b) shows a well-formed phrasing on the basis of the syntactic structure. Furthermore, the large NP after "see" in (10a) is equivalent to the word "her" in (10b). It would be quite a strain on the speaker to produce one phrase that runs all the way from "the old" to "road", whereas it is very simple to produce one intonational phrase in (10b).

(10)  
   a. I can see the old customs office at the end of the bend in the road.  
   b. I can see her.

The NP after "see" tends to be very well phrased into more than one unit, viz.

(11) //the old customs office//at the end // of the bend//in the road//

(Gussenhoven and Jacobs: 249f.).

Intonational phrasing thus is determined by abundance of factors that can be summarized in Selkirk's (2005: 1) words:

"The Intonational phrase organization of a sentence is a hybrid beast. It sometimes shows a tight correlation with the semantic properties of the sentence, namely what the sentence means in standard truth conditional terms. It sometimes appears to be a reflex of the focus structure of the sentence. Sometimes it appears to be correlated with the length of the constituents of a sentence. And sometimes it seems merely to reflect a stylistic option in the utterance of a sentence."

As a result, it would be too difficult to delimit intonational phrasing process into being affected by specific elements while other factors can be very likely to be at play.

1.3.2. The Structure of the Intonational Phrase:

Selkirk (1984: 26) proposes that the structure of the intonational phrase can be viewed as having a hierarchy of certain categories
forming the prosodic structure for English called "Prosodic Hierarchy (PH)" as shown in (12) below.

(12)

a. Utterance (U)
b. Intonational Phrase ("IP" or "I")
c. Phonological Phrase ("PhP" or "φ")
d. Prosodic Word ("PWd" or "ω")
e. Foot (Ft)
f. Syllable (Syl)

Both of (Ft) and (Syl) will be referred to when necessary, though they are practically beyond the scope of this study, unlike the other categories. Selkirk (1986: 384) expresses the prosodic structure as a system of bracketing as in (13):

(13)

( ) U
( ) ( ) IP
( ) ( ) ( ) ( ) PhP
( ) ( ) ( ) ( ) ( ) PWd

1. The (U)terance: It is the upper limit that may be "isomorphic with a single syntactic sentence; it applies across two sentences addressed to the same listener and not separated by a pause, or it cannot apply across two sentences addressed to different listeners, even if they are spoken without an intervening pause (Gussenhoven and Jacobs, 2011: 252).

2. The Intonational Phrase (IP or I): According to Selkirk (1984: 27), IP corresponds to a span of the sentence associated with a characteristic contour or melody. A sentence may correspond to one or more intonational phrases. She also argues that the idea that the definition of what may constitute an intonational phrase is "essentially semantic in character". Additionally, Truckenbrodt (2007: 436) states that IP refers to a prosodic constituent related to the syntactic clause. Gussenhoven and Jacobs (2011: 252) show that IP "tends to correspond to the root sentence, i.e. a single (NP VP)-structure without interruptions". For example, (14a) represents a single IP as being a root sentence, and at the same time, it is (U). (14b) shows that In Pakistan and the relative clause which is a weekly have been assigned to separate IPs within one U. When the subject is longer than a single lexical word there will tend to an IP boundary between the subject NP and the VP, as shown in (14c) (ibid.).

(14)
a. 1(Tuesday is a holiday)
b. (In Pakistan) (Tuesday) (which is a weekday) (is a holiday)

c. (The second Tuesday of every month) (is a holiday)

3. The Phonological Phrase (PhP or φ) or Intermediate Phrase as called by Pierrehumbert (1980: 5) is a prosodic constituent occurring right beneath the intonational phrase. It is composed of a group of words bearing at least one pitch accent. The edge tone appearing at intermediate phrase boundaries is called a “phrase accent”. It controls the pitch shape between the last pitch accent of the intermediate phrase and the beginning of the next one. Conventionally, phrase accents are represented as H- or L-.

According to Truckenbrodt (2007: 436), the PhP relates to syntactic phrases (XPs) such as Noun Phrases (NPs), Verb Phrases (VPs), and Adjective Phrases (APs). Gussenhoven and Jacobs (2011: 253) agree with Truckenbrodt in corresponding PhP to the syntactic phrase as can be shown in (14) where each syntactic phrase is a separate φ (ibid. 254).

(14) φ(Rabbits) φ(reproduce quickly) φ

4. The Phonological Word (PhP or ω) (also known as the prosodic word) corresponds normally in a one-to-one fashion to the morphological word (ibid. 255). This can be shown in (15) where each morphological word corresponds to a ω.

(15) ω(In) ω(Pakistan) ω(Tuesday) ω(is) ω(a) ω(holiday) ω

This prosodic structure has been claimed to have certain properties:

a. The prosodic structure consists of prosodic categories of different types, e.g. prosodic word, phonological phrase, intonational phrase, and utterance.

b. For any prosodic category, the sentence is exhaustively parsed into a sequence of such categories.

c. The prosodic categories are ordered in a hierarchy (in the order given above), and in phonological representation they are strictly organized into layers.

d. The hierarchical arrangement of prosodic categories forms a well-formed bracketing (Selkirk, 1986: 384).

1.4. Theories of Intonational Phrasing:

1.4.1. Selkirk’s Theory:

The Prosodic Hierarchy mentioned above has vividly shown an intensive correlation between the phonological structure and the syntactic structure as they correspond to each other in their domains. Selkirk (1986: 383f.) proposed that the syntax-prosodic structure relation is characterized by a set of interface constraints which require that "the edge of every constituent of a designated type in the surface syntactic structure of a sentence coincide (=align with) the edge of a prosodic constituent of a designated type in prosodic structure". Her
theory was known as "Edge-Based Prosodification", given in (16) below:

(16) **Edge-Based Prosodification**

The right (left) boundary of a prosodic constituent C corresponds to the right (left) boundary of morphosyntactic category X.

As (16) claims and according to Gossenhoven and Jacobs (2011: 257), "to derive a prosodic constituent, all we need to know is which syntactic constituent it 'co-begins' or 'co-ends' with.

Another theory of intonational phrasing is Truckenbrodt’s (1999: 219) “Wrap Constrain” that favours prosodic phrasings that do not break up syntactic constituents over those that do. This constraint does not apply to adjuncts or clauses.

Selkirk’s Edge-Based theory had experienced many revisions, but the most significant ones were, first, Selkirk (2000: 232) when she elaborated the Edge-Based theory to specifically show the syntax-prosody relation with respect to the phonological and syntactic phrases level. This constraint can be expressed as follows:

(17) **Align (XP, R; MaP, R)**

"The right edge of any XP in syntactic structure must be aligned with the right edge of a MaP in prosodic structure"

"XP" indicates any syntactic phrase, such as "Noun Phrase (NP)", "Verb Phrase (VP)", "Adjectival Phrase (Adj. P)", "Prepositional Phrase (PP)", etc. R means "right". "Map" stands for "Major Phonological Phrase" that is determined by the maximal projection, i.e. (XP) in syntactic structure. For example, (18) contains two syntactic phrases which are parsed into two "Major Phonological Phrases (MaPs)".

(18) (They issue marriage licenses)\textsubscript{Map} (at Town hall)\textsubscript{Map}

The second revision took place when Selkirk (2011: 5) proposed a more comprehensive theory of the syntactic-prosodic constituency relation, one which calls for a direct match between syntactic and prosodic constituents as to other prosodic constituents insofar as the other syntactic constituents are manifested prosodically within certain domains. The so called "Match Theory" is given in (19):

(19) **Match theory of syntactic-prosodic constituency correspondence:**

a. Match Clause:

A clause in syntactic constituent structure must be matched by a corresponding prosodic constituent, call it "I", in phonological representation.

b. Match Phrase:

A phrase in syntactic constituent structure must be matched by a
corresponding prosodic constituent, call it "φ", in phonological representation.
c. Match Word:
A word in syntactic constituent structure must be matched by a corresponding prosodic constituent, call it "ω", in phonological representation.

The standard clause, as Selkirk (ibid. 18) shows, is the "constituent that is … commonly assumed to introduce the canonical sentence, which consists of an explicit or implied subject, a predicate, and a locus for Tense". Hence the standard clause may be syntactically embedded, whether as a complement to a verbal or nominal head, or as a restrictive relative clause within determiner phrase, or in other positions. The phrase is shown as a syntactic category that predicts the sort of "φ" organization that is typical in languages: SVO sentences like: NP VP [Verb NP ]VP are parsed into "φ-domains" as (NP)φ (Verb (NP)φ)φ;
double object structures like VP [Verb NP NP]VP are parsed as (Verb (NP)φ (NP)φ)φ (ibid. 19)

As to the syntactic constituent "word", Selkirk distinguishes two categories of words, as far as English is concerned, namely, "functional words" and "lexical words". Lexical category words are standardly parsed as prosodic words "ω", while functional category words like determiners, complementizers, prepositions, auxiliary verbs, etc., in particular the monosyllabic versions of these, are not (ibid. 19).

Selkirk asserts that this set of universal match constraints calls for the constituent structures of syntax and phonology to correspond; it predicts a strong tendency for phonological domains to mirror syntactic constituents. Moreover, in identifying distinct prosodic constituent types (I, φ, ω) to correspond to the designated syntactic constituent types, Match theory embodies the claim that, in the ideal case, the grammar allows the fundamental syntactic distinctions between clause, phrase and word to be reflected in, and retrieved from, the phonological representation (ibid.).

1.4.2 Watson and Gibson's Theory:
In their trial to investigate an incremental theory for the likelihood of intonational boundaries location, Watson and Gibson (2004, P. 713) proposed a model that is considered a meaning-based proposal which includes two components: “Recovery and Planning”. According to this model, the presence of longer syntactic constituents increases the probability of an intonational boundary before and/or after the long constituent. The recovery component is thus defined in terms of the size of the most recently completed constituent (i.e., material to the left of the boundary), where a constituent is complete if
it has no obligatory rightward dependents. At the same time, it is observed that more boundaries tend to occur before the production of longer syntactic constituents. The planning component is therefore defined in terms of the size of upcoming material (i.e., material to the right of the boundary). Furthermore, Watson and Gibsons’s model includes the constraint that words and constituents that rely on one another for meaning should be produced in the same intonational phrase, which is compatible with the “Sense Unit Condition (SUC)” mentioned in (10) above.

“Recovery and Planning” components emphasizes the general array that not only does syntactic structure influence intonational phrasing; actually, speakers’ awareness of listeners’ needs may also play a role, as well as factors such as discourse structure, speaker style, and information structure. (P. 752)

1.5. Intonational Phrasing in Arabic:

The idea that there are phenomena of interest to be found at the syntax-phonology interface in Arabic is by no means new. The rules of Quranic recitation (tajweed) include rules of ‘stopping’ (waqf) and ‘starting’ (ibtida’), by which the text is marked to show positions in the text at which a prosodic juncture is compulsory (⃗), recommended (⃗) or prohibited (⃗) (Sawalha et al., 2012: 1). There are also marks to show alternative potential juncture positions, each of which results in a different interpretation (⃗...⃗). This study is confined to chunking the Quranic verses into certain constituents depending on syntactic and semantic bases. Through a series of researches, Hellmuth (2004, 2007, 2012, and 2016) discussed the prosodic structure of Egyptian Arabic (EA) as to phonological phrasing (2004), pitch accent distribution (2007), variable cues to phrasing (2007), and comparing the mapping of syntactic structure to prosodic structure in Jordanian Arabic and Egyptian Arabic (2016). Many points can be detected from these studies:

a. The corpus of the study was based on read sentences in which the syntactic complexity and prosodic weight, i.e. variously multisyllabic structures, varied.

b. Phrases at the MaP level are long in EA, so that most utterances were realized within a single MaP, straddling utterance internal XP-edges.

c. A mid-utterance boundary was only observed when the subject NP was both syntactically complex and prosodically heavy; in particular, a phrase boundary only occurred after the subject NP when it contained at least four PWds.

d. The study proposed two well-formedness constraints for a complex NP: The first constraint requires each MaP to be comprised of at least two Minor Phonological Phrases (MiP).
The second constraint requires each MiP to be comprised of at least two PWds.

The current study will try to follow some of the procedures used in Hellmuth (2004 and 2012), especially:

a. Using the read sentences strategy in collecting the data.

b. Adopting the principle that sentences structure may contain syntactic complexity and prosodic weight in order to show the various types of intonational phrasing replicating the design of Frota et al (2007).

c. Investigating the various structures of the Phonological Phrase or Intermediate Phrase) and the relationship that holds with the syntactic structure of the utterance.

d. Showing the presence of the various cues used in phrasing.

1.6. Cues to Intonational Phrasing:

Hellmuth (2012: P. 7) adopts a group of certain cues whereby the positions of juncture among the different prosodic categories can be detected. Table (1) below shows the cue labels used for the description of each juncture.

<table>
<thead>
<tr>
<th>No.</th>
<th>Label</th>
<th>Name</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>B</td>
<td>Boundary tone</td>
<td>Boundary shows a full boundary tone (usually a final fall)</td>
</tr>
<tr>
<td>2.</td>
<td>D</td>
<td>Downstep (final lowering)</td>
<td>Peak of the word at the boundary is produced at a lower level than expected from effects of downstep alone, relative to pitch level of the previous peak</td>
</tr>
<tr>
<td>3.</td>
<td>H</td>
<td>Phrase tone</td>
<td>Boundary shows either H- or L- phrase tone</td>
</tr>
<tr>
<td>4.</td>
<td>L</td>
<td>Lengthening</td>
<td>Word at the boundary is lengthened</td>
</tr>
<tr>
<td>5.</td>
<td>P</td>
<td>Pause</td>
<td>Boundary is followed by a pause (filled, e.g. with an in-breath, or unfilled)</td>
</tr>
<tr>
<td>5.</td>
<td>R</td>
<td>Reset</td>
<td>Following peak is produced at higher level than the peak of the word at the boundary</td>
</tr>
<tr>
<td>6.</td>
<td>S</td>
<td>Suspension of downstep</td>
<td>Peak of the word at the boundary is produced at the same level as the previous peak</td>
</tr>
<tr>
<td>7.</td>
<td>U</td>
<td>Upstep</td>
<td>Peak of the word is produced at a higher level than the previous peak</td>
</tr>
</tbody>
</table>

Table (1): Cues labels for the description of each juncture.

The above cues will be adopted to explore the juncture position in MSA utterances.

1.7. The Notation:

In order to explain the intonational structure of an utterance, a certain notation is needed. Generally speaking, Silverman et al. (1992) proposed the ToBI (Tone and Break Indices) system which was “designed for use in labelling intonation and prosody in databases of spoken Mainstream American English”. Very quickly, it came to refer
to a general framework of the development of prosodic annotation systems in other varieties of English (ibid.). A ToBI transcription for an utterance, according to Beckman et al. (2005: 28) consists minimally of six parts, two are continuous phonetic records and four are symbol strings. The primary continuous phonetic record is an audio recording of the utterance. The waveform in the top panel of each figure is a graphic representation of this recording. The other continuous phonetic record is some representation of the fundamental frequency (F0) contour. The four symbol strings are:

a. **A Tone Tier**: It consists of labels for distinctive pitch events, transcribed as a sequence of high (H) and low (L) tones marked with diacritics indicating their intonational function as parts of pitch accents or as phrase tones marking the edges of two types of intonationally marked prosodic units, those associated with two different degrees of juncture or boundary strength, i.e., the intermediate phrase versus the intonational phrase.

b. **A Break Index Tier**: Break indices represent a rating for the degree of juncture perceived between each pair of words and between the final word and the silence at the end of the utterance. They are to be marked after all words that have been transcribed in the orthographic tier. All junctures - including those after fragments and filled pauses - must be assigned an explicit break index. Values for the break index are chosen from the following set:

- (0) Cases of clear phonetic marks of clitic groups with very close inter-word juncture, i.e. a juncture smaller than a word boundary.
- (1) Most phrase-medial word boundaries.
- (2) Word boundaries marked by pitch accent but no intonational phrase boundaries (minor/acentual phrase boundaries), or ordinary phrase-internal word end.
- (3) Intonational phrase boundaries marked by a single rising phrase tone (major/intermediate phrase boundaries).
- (4) Full intonation phrase boundary; i.e. marked by a final boundary tone after the last phrase tone.

For example, through the sentence (7c) above, here (20), the juncture strength can be shown.

(20) Take the trash out, Carmella.

The strength juncture between “the” and “trash” can have the level number (0), since the definite article is cliticized with the word “trash”, while the strength juncture between “Take” and “the”, between “trash” and “out” is expressed through level (1). On the other hand, the boundary between “out” and “Carmella” can have a strength juncture level (3), since the word “out” is posited at the
end of the first intermediate phrase followed by “Carmella” which is a separate intermediate phrase.

c. **An Orthographic Tier**
The orthographic tier shows a straightforward transcription of all of the words in the utterance, either in ordinary English orthography or transliteration of the utterance in any other language.

d. **A Miscellaneous Tier**
The miscellaneous tier, like the orthographic tier, can include many events that are arguably not part of prosody like a cough that stands for an occurrence of disfluency in the utterance (Beckman et al (2005: 28f.). See also Beckman and Elam (1997: 8ff.) and Helmuth (2011: 6)

Since our main concern in this paper is to investigate the prosodic-syntactic constituency, certain modifications for the original notation are made. Firstly, the first phonetic record will contain only the pitch representation that obviously shows the phonetic record of the utterance. Secondly, the first symbol string will label the phrasing cues instead of the tones, since phrasing g cues are more decisive in limiting the constituency boundaries than the tones. Thirdly, the third tier, namely, the break indices one will be used to show only the (3) and (4) juncture values. This is also due to our main concern with expressing the limits of prosodic-syntactic phrasing which is carried out through positing the above mentioned values on the phrases boundaries. Fourthly, orthographic tier, which is normally posited at the third string, will move down to the forth tier, while the third tier will label prominence levels in each word. This aims to explicate the prominence structure of phrases as a whole and consequently relate this to the phrasing mechanism throughout the utterance. Finally, the last tier, namely, the Miscellaneous Tier will be left out since the data collected in this study have witnessed no interruptions which can be regarded as disfluency to the utterances. (cf. Hellmuth, 2011: 7)

For example, Figure (1) shows a notation sample for how each utterance is analyzed.
Figure (1): A sample notation of labelling and analysis.

The top panel is a pitch record for the utterance showing the movements of pitch levels produced by the speaker. The first tier shows a string of cues at each phrase boundary. This utterance, for example, is divided into two prosodic phrases: the first contains the noun phrase “'atta:lib” “the student” (sing., msc.) that stands as a separate prosodic phrase, due to the presence of three intonantional cues, namely, (L--) that shows a phrase boundary tone, (P) that stands for a pause, (R) that labels pitch reset since the final peak in the phrase ends with 159.5 Hz pitch level whereas the following phrase starts with 170 Hz pitch level, and (L) which expresses the lengthening of the word at a pre-boundary location. The second prosodic phrase is the verb phrase “jaktubu l-wa:gba” “writes the homework”. The cues terminating the second phrase are (B) which shows a full boundary tone, usually a final fall, and (D) that means a final lowering for the word produced at a lower level than expected. The end of second phrase is consequently regarded the end of the whole intonational phrase IP which consists of two intermediate phrases.

The second tier represents the break indices string that determines the degree of juncture between words. The first prosodic phrase is labelled the index 3, since it is considered an intermediate (or a major) phrase at the middle of the utterance, while the intonational phrase IP take the break index 4 pointing out the strongest degree of juncture.

In the third tier, each syllable that takes the highest pitch level in the contour is assigned (P) as prominence. Prominance assignment is an important factor is analyzing the structure of the prosodic phrase insofar as it is related to the syntactic constituency of the utterance. Finally, the fourth tier shows the whole utterance divided into prosodic words transliterated into English.

1.8. Modern Standard Arabic:

The data used for analysis in this study are utterances pronounced in Modern Standard Arabic (MSA). MSA is the variety of language used in written Arabic media, e.g., newspapers, books, journals, street signs, advertisements – all forms of the printed word. It is also the language of public speaking and news broadcasts on radio and television (Ryding, 2005: 5). Thus, this means that in the Arab world one needs to be able to comprehend both the written and the spoken forms of MSA. MSA sentence structure comprises two types: "nominal sentences" or "equational sentences" referring to a sentence that contains no verb, and "verbal sentence" which contains a verb (ibid: 59). The verbal sentence has two main structures, viz. "Subject-Verb-Object (SVO)" and "Verb-Subject-Object (VSO). (See Ryding, 59ff. for more details on MSA word order.)
2.1. The Data of the Research:

In order to show the structure of intonational phrasing in MSA certain target sentences were suggested so that they can express phonology-syntax interaction in MSA. Following the norms set by Frota et al. (2007) in choosing utterances that are both prosodically heavy and syntactically complex, the following utterances are selected.

الطالب يكتب الواجب.

1. “؟aTTa:libu yaktubu l-wa:jiba”
   [The student(sing.masc.)][writes(sing.masc.)][the homework(sing.masc.).]
   - **The student writes the homework**

2. الطالب الشاطر في الصف يكتب الواجب.
   “؟aTTa:libu shsha:Tiru fiSSaffi yaktubu l-wa:jiba”
   [The student (noun.sing.masc.)][the hard-working (adj.sing.masc.)][in the class(pp.)][writes (v. sing.masc.)][the homework(noun.sing.masc.).]
   - **The hard-working student in the class writes the homework.**

3. الطالب الشاطر الذي يجلس في الصف يكتب الواجب.
   ٌكاتب الطالب الواجب.
   ??aTTa:libu shsha:Tiru lladhi: yajlisu fiSSaffi yaktubu l-wa:jiba
   [The student (noun.sing.masc.)][the hard-working (adj.sing.masc.)][who sits in the class (relative clause)][writes (v. sing.masc.)][the homework(noun.sing.masc.).]
   - **The hard-working student who sits in the class writes the homework.**

4. يكتب الطالب الواجب.
   yaktubu TTa:libu l-wa:jiba
   [writes (sing.masc.)][the student(sing.masc.)][the homework(sing.masc.).]
   - **The student writes the homework.**

5. يكتب الطالب الواجب الثاني.
   yaktubu TTa:libu l-wa:jiba ththa:ni:
   [writes (sing.masc.)][the student(sing.masc.)][the homework(sing.masc.)][the second (adj.number, sing.masc.)]
   - **The student writes the second homework.**

6. يكتب الطالب الواجب الثاني الذي أوصى به المعلم.
   [writes (sing.masc.)][the student(sing.masc.)][the homework(sing.masc.)][the second (adj.number, sing.masc.)][which was given by the teacher (relative clause)]
   - **The student writes the second homework which was given by the teacher.**

7. الطالب الجالس في الصف بجانب غرفة المدیر يكتب الواجب الثالث الذي أوصى به المعلم.
   ??الطالب الجالس في الصف بجانب غرفة المدیر يكتب الواجب الثالث الذي أوصى به المعلم.
The student sitting in the class next to the principal’s room writes the third homework which was given by the teacher.

These target sentences were chosen because of the following reasons:

1. They show a variety in the word-orders in MSA whether the sentence starts with the (S)ubject, as in “1, 2, 3, and 7” or with the verb as in “4, 5, and 6”.

2. Both the syntactic complexity and prosodic weight in the subject and object domain are taken into account in order show the different types of phrasing the informant may produce during the pronunciation of the sentences.

3. Some ambiguous structures are deliberately chosen in order to detect how the informants phrase the sentence and consequently manifest the interrelationship that hold between the various structures of sentences.

2.2 Data Collection:

Eight candidates (6 male (ali, amm, bro, dil, maan, and miq) and 2 female (dib and lil) informants) were asked to pronounce the above mentioned target sentences. The candidates were all teachers of Arabic linguistics and literature at the Department of Arabic / the College of Arts / University of Mosul. Choosing the quality of candidates was based on the idea that MSA is the formal language taught at the Department of Arabic and that they can be considered continuous and professional users of MSA during their lectures, and, consequently, they can be the most suitable samples for the research, and thus their performance can be highly depended upon as an actual production of MSA language. Furthermore, all the candidates had no pronunciation difficulty or hearing impairments. Each one was asked to pronounce each single target sentence shown on a computer screen. The candidate’s performance was recorded by a digital voice recorder (GENX GDVR-901) set in front of the candidate in order to obtain the highest resolution of voice quality. The total number of the sentences is 56. Auditory transcriptions were made of all sentences by the researcher with reference to fundamental frequency levels and pitch contours using Praat 5.1.19 Program (Boersma & Weeninck 2009).

2.3 Data Analysis and Discussion:

Taking into consideration the various sentences targets used in the study, we will start analyzing each sentence target alone in order to detect the patterns of phrasing adopted by the candidates. It can be
shown that there is a huge variation in how the different target sentences are phrased and whether the main factors determining the phrasing techniques are phonological or syntactic. The orientation of analysis is meant to focus on where and how each single target sentence is likely to be phrased into separate chunks taking into account the phonological structure, on the one hand, and the syntactic structure on the other hand. The phonological structure is based on the following points:

1. The number of the prosodic words "ω" gathered in each separate unit.
2. The phonetic cues adopted in achieving the phrasing.

The syntactic structure, on the other hand, is detected on the basis of phrasing the utterances into syntactic units according to whether the phrased unit can be:

a. the whole sentence (no phrasing)
b. the subject
c. the object

2.3.1. The Whole Sentence (No Phrasing) (S V O or V S O Structures):

Among the total number of the utterances produced, namely 56, the number of the cases where the target sentences experience no phrasing, i.e., produced as one IP is 22 utterances taking the following structures:

1. S V O (4 candidates), as shown in Figure (2) below.

2. S(N+Adj.+PP) V O (1 candidate), as shown in Figure (3) below.
Figure (3): A sample notation for U2 production

3. **S (N+Adj.+RC) V O** (1 candidate), as shown in Figure (4) below.

Figure (4): A sample notation for U3 production.

4. **V S O** (8 candidates), as shown in Figure (5) below.

Figure (5): A sample notation for U4 production.
5. **V S {O (NP + Adj.)} (6 candidates), as shown in Figure (6) below.**

Figure (6): A sample annotation of U5 production.

6. **V S {O(NP + Adj. + RC)} (2 candidates), as can be shown below in Figure (7).**

Figure (7): A sample annotation for U6 production.

Figures (2-7) have shown a considerable variation in the number of the prosodic words in each utterance as can be shown below in Table (2).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TS1</td>
<td>3</td>
<td>S V O</td>
<td>4</td>
</tr>
<tr>
<td>TS2</td>
<td>5</td>
<td>S V O</td>
<td>1</td>
</tr>
<tr>
<td>TS3</td>
<td>7</td>
<td>S V O</td>
<td>1</td>
</tr>
<tr>
<td>TS4</td>
<td>3</td>
<td>V S O</td>
<td>8</td>
</tr>
<tr>
<td>TS5</td>
<td>4</td>
<td>V S O</td>
<td>6</td>
</tr>
<tr>
<td>TS6</td>
<td>8</td>
<td>V S O</td>
<td>2</td>
</tr>
</tbody>
</table>

Table (2): The distribution of the prosodic words “ωs” within the utterances

The total number of all target sentences which show the S V O structure, whether phrased or not, is 32. According to Table (2), only 6 performances have produced the {S V O} structure with no phrasing. This is meant to be a general tendency towards phrasing the sentences regardless of the length of these sentences.
Moreover, Table (2) shows that though U1 and U4 contain 3 ωs each, all the eight candidates opt for producing U4 as one single “IP” while only four candidates prefer to produce U1 as one “IP”. U2 and U3 show an increase in the “ωs” number (5 ωs and 7 ωs, respectively) resulting in one single production of each utterance as one single “IP”. On the contrary, the increasing number of “ωs” in U5 and U6 (4 ωs and 8 ωs, respectively) does not pose an obstacle against having six candidates produce U5 as one “IP” or even producing U6 that consists of 8 ωs as one “IP”. These cases indicate a point in the sense that there is a stronger verb-subject-object connection in {V S O} Arabic structure than the one in {S V O} structure even if the number of ωs whether in the subject or object is relatively big. This orientation can be obviously shown when the number of candidates producing {V S O} structure in (U4-6) is 16 out 22 while only 6 candidates out of 22 have the production of {S V O} structure according to these cases.

2.3.2. The Subject: The production of the target sentences has shown different ways of phrasing, especially how the subject is phrased. The subject has two positions in the target sentences: utterance-initial position and after-verb position.

2.3.2.1. Utterance-Initial Subject - {(S) V O} Structure:

The {(S) V O} structure is shown to have various types of phrasing depending on the internal structure of the subject in addition to the types of cues that pose the intonational boundaries between the subject as a separate constituent from the rest of the sentence elements. The number of the utterances which show the {(S) V O} structure is 17 out of 32 utterances which have the general structure of S V O. The subject in such cases is noticed to take different phrasing.

1. {S} [H-PL] V O (2 candidates), as shown in Figure (8) below.

Figure (8): A sample notation for U1 production.

2. {S} [L-RPL] V O (2 candidates), as shown in Figure (9) below.
Figure (9): A sample notation of U1 phrasing

Figures (9) and (10) show that in a short sentence like U1, the subject consisting of one ω only can form a separate phonological constituent as an intermediate phrase with different phonological and phonetic cues that separate the subject from the rest of the sentence. This proves that one single ω can form a phonological constituent in MSA, which disagrees with Hellmuth (2004) in that in a typical SVO sentence, unless the subject constituent is composed of several prosodic words, there will be no prosodic boundary at the right edge of the subject (see Section 2.8. above).

3. {S(N+Adj.)}[H-PL] + PP V O, (2 candidates), as shown in Figure (10) below.

Figure (10): A sample notation for U2 phrasing.

4. {S(N+Adj.)}[L-RPL] + PP V O, (3 candidates) as shown in Figure (11) below.
Figure (11): A sample notation for U2 phrasing.

5. \{S(N+Adj.+PP)}[H-PL] + V O, (2 candidates) as shown in Figure (12) below.

Figure (12): A sample notation for U2 phrasing.

The subject in U2 has experienced two different phrasings as to where intonational boundaries are located. Figures (10) and (11) show that a boundary occurs after the subject consisting two \(\omega\)s regarding the prepositional phrase “fiSSaffi” “in the class” as a dependent argument for the verbal phrase “yaktubu l-wa:jiba” “writes the homework”. This renders the sentence in that the action of writing the homework takes place only in the class and nowhere else.

In Figure (12), “fiSSaffi” “in the class” becomes part of the subject which now contains three \(\omega\)s and consequently a dependent argument for the head “?aTTa:libu” “The student”. The sentence as such means that the student is hard-working only in the class and nowhere else.

6. \{S(N+Adj.+R(letive C(lause))} [L-RPL] + V O, (2 candidates) as shown in Figure (13) below.
Figure (13): A sample notation for U3 phrasing.
7. \{S(N+Adj.+RC)\} [H-PL] + V O, (2 candidates) as shown in Figure (14) below.

Figure (14): A sample notation for U3 phrasing.
8. \{S(N+Adj.)\} [H-PL] + {RC} [L-RPL] + V O (2 candidates)

Figure (15) gives a notation for such a phrasing.

Figure (15): A sample notation for U3 phrasing
9. \{S(N+Adj)\}[L-RPL] + {RC} [L-RPL] + V O (1 candidate)

Such a phrasing can be seen in Figure (16) below.
Figures (13-16) show a variation in producing different phonological constituency for the subject. First, Figures (13) and (14) express a subject constituent as a phonological phrase that includes five ωs. The relative clause “?alladhi yajlisu fiSSaffi” - “who sits in the class” - stands for an argument for the head “?aTTalibu” - “The student”. This agrees with Breen et al. (2011: 7) in that when the relative clause is interpreted as a restrictive clause it is likely not to be separated from the head and consequently it becomes a dependent argument for the head.

Second, in contrast with the previous analysis, Figures (15) and (16) express a tendency towards interpreting the relative clause “?alladhi: yajlisu fiSSaffi” - “who sits in the class” - as non-restrictive and thus it becomes a separate intermediate phrase. Again, Breen et al (2011: 8) demonstrate that when discourse supports a non-restrictive reading for the relative clause, speakers are significantly likely to produce a phonological constituent that includes the relative clause only. The phonological constituency in MSA demonstrates a similar orientation as to how the relative clause is rendered within sentences, namely, restrictively or non-restrictively.

10. {S(N+Adj+PP+Pl.Adv)} [H-PL] + V {O(N+Adj) + {RC}, (2 candidates) as shown in Figure (17) below.

Figure (16): A sample notation of U3 phrasing.

Figure (17): A notation sample for U7 phrasing.
11. \{S(N+Adj+PP+Pl.Adv)}[L-RPL] + V + \{O(N+Adj+RC}\} (1 candidate). Figure (18) shows such a phrasing.

![Figure (18): A notation sample for U7 phrasing](image)

The subject constituent in Figures (17) and (18) is produced as having six omega (ωs) which is considered a long subject. It is very much likely that the prepositional phrase “bija:nibi gurfati l-mudi:ri:” - “beside the principal’s office” - is expressed as an argument dependently connected to the previous prepositional phrase “fiSSaffi:” - ”in the class” - which is in turn an argument for the head “?aTTa:libu” – “The student”. The length of the subject can in no way prevent the candidates from producing such a long prosodic constituent which is determined to have a tight semantic closeness between the omega (ωs) in it.

12. \{S(N+Adj+PP)}[L-RPL] + \{Pl.Adv}][L-RPL] + V + \{O(N+Adj}\} [H-PL] +\{RC\} (2 candidates), as can be seen in Figure (19) below.

![Figure (19): A notation Sample for U7 phrasing](image)

13. \{S(N+Adj.+PP)}[H-PL]+\{Pl.Adv.]}[H-PL]+V+\{O(N+Adj+RC}\} (2 candidates). Figure (20) shows such a phrasing.
Figure (20): A notation sample for U7 phrasing
14. \{S(N+Adj+PP)[L-RPL] + \{Pl.Adv\}[H-PL] + V + \{O(N+Adj)[L-RPL] + \{RC\} (1 candidate). Such a phrasing can be annotated in Figure (21) below.

Figure (21): A notation sample for U7 phrasing

Figures (19 – 20) demonstrate a different intonational constituency for the subject in that it is divided into two prosodic constituents: the first is the noun phrase “ʔaTTaːlibu ʔa:jjaːlisu fi(SSaffi)” – “The student sitting in the class” – while the second is the prepositional phrase “bijə:nibi gu(rfati) l-mudiːri:” – “beside the principal’s office”. The reason for locating an intonational boundary before the prepositional phrase may be due to subject length as having 6 ωs and that this requires posing an intonational boundary immediately before the prepositional phrase. Another point is that balancing between the constituents plays an important role in planning the division of a moderately long utterance into constituents containing possibly the same number of ωs (Watson and Gibson, 2004: 715).

2.3.2.2. After-Verb Subject:

The second position for the subject in the data is its immediate occurrence after the verb. U5 and U6 contain an after-verb subject which consists of one single ω followed by a prosodically complex
and syntactically heavy object in both utterances.

1. \( V + S \ [H-PL] + \{O\ (N + \text{Adj.})\} \) (2 candidates), as shown in Figure (22).

![Figure (22): A notation sample for U5 phrasing.](image)

2. \( V + \{S\} \ [L-RPL] + \{O(N+\text{Adj})\} \ [H-PL] + \text{RC} \) (2 candidates), as shown in Figure (23) below.

![Figure (23): A sample annotation for U6 phrasing](image)

The subject along with the preceding verb in both utterances form one single constituent separated from the object. This constituency can be attributed to the notion that the subject is a dependent argument for the verb that determines no intonational boundary located between them (Watson and Gibson, 2004: P. 710). Balance in constituent size may very likely play a role in having an intonational boundary between the verb and subject, on the one hand, and the prosodically complex object, on the other.

2.3.3. The Object:

Like the subject, the object can also experience different ways of phrasing, likely because of the effects of length and semantic closeness. Figures (17), (18) and (20) above show that the object in U7, though prosodically heavy and syntactically complex, is not separated from the rest of the verb phrase which already contains the subject preceded by the verb. The absence of any intonational boundary in such cases may be due to the semantic closeness the
candidate tries to reserve in the pronunciation of the utterance. Similarly, the relative clause at the end of the object is not considered non-restrictive and thus its presence is obligatory within one single intonational phrase with the rest of the object.

Figure (17) and (18) demonstrate that balance in the length of the intonational phrases can also be a significant factor in locating the intonational boundaries. Since the only boundary in the utterance is located at the end of the long preceding subject, balance is being reserved in the utterance and thus no intonational boundary is located object-internally. On the contrary, there are many utterances whose objects have experienced processes of phrasing. In Figure (22) above, a boundary separates the object “?alwa:jiba thha:ni:” “the second homework” which contains two ωs from the rest of the utterance. In Section 3.3.1 above, and as shown in Figure (5), it is noticed that all the candidates produce U4 “yaktubu TTa:libu l-?alwa:jiba” “The student writes the homework” with no boundary before the object which consists of one ω. However, the complex object “?alwa:jiba ththa:ni:” introduces an intonational boundary before the object.

In contrast, Figures (19) and (21) for U7 above show that the relative clause “?alladhi: ?awSa: bihi l-mu3allimu” “given by the teacher” is intonationally phrased from the object “?alwa:jiba thha:ni:” “the second homework” along with the verb “yaktubu” “writes”. There may be two reasons for the phrasing. First, all the intonational phrases produced in U7 demonstrate a balance in size concerning the number of ωs in each group in both of the complex subject which already consists of two intonational groups “?aTTalibu sha:Tiru fiSSaffi” “The hard-working student in the class” and “ “bijanibi gurfat l-mudi:ri” “next to the principal’s office” having 3 ωs each and the verb phrase that consists the verb and the object “yaktubu l-?alwa:jiba thha:ni:” with 3 ωs and the relative clause “?alladhi: ?awsa: bihi l-mu3allim” “given by the teacher” which includes 4 ωs. Reserving the balance in the overall size of each constituent is thought to be a good reason for producing intonational constituency like this.

The second reason can be expressed through the complexity in the object which introduces a boundary within the object, which is a common reason for the phrasing of the object in U5 and U7. Figures (19), (21), and (23) show that the object ends with the relative clause “?alladhi: ?awSa: bihi l-mu3allimu” ‘given by the teacher”. Again, it is thought that the relative clause is considered non-restrictive and thus phrased separately from the rest of the object.

2.4. The Intonational Cues:

The above discussion shows diversity in the usage of the intonational cues by the candidates in locating the intonational phrases amongst the utterances. This can be obviously reflected in the identity
and percentage of which cues are used in showing the phrases. The above figures show that the cues used in phrasing are H-PL

<table>
<thead>
<tr>
<th>H</th>
<th>Phrase tone</th>
<th>Boundary shows H- phrase tone</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>Pause</td>
<td>Boundary is followed by a pause (filled, e.g. with an in-breath, or unfilled)</td>
</tr>
<tr>
<td>L</td>
<td>Lengthening</td>
<td>Word at the boundary is lengthened</td>
</tr>
</tbody>
</table>

L-RPL, |

<table>
<thead>
<tr>
<th>L-</th>
<th>Phrase tone</th>
<th>Boundary shows L- phrase tone</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>Reset</td>
<td>Following peak is produced at higher level than the peak of the word at the boundary</td>
</tr>
<tr>
<td>P</td>
<td>Pause</td>
<td>Boundary is followed by a pause (filled, e.g. with an in-breath, or unfilled)</td>
</tr>
<tr>
<td>L</td>
<td>Lengthening</td>
<td>Word at the boundary is lengthened</td>
</tr>
</tbody>
</table>

and BD |

<table>
<thead>
<tr>
<th>B</th>
<th>Boundary tone</th>
<th>Boundary shows a full boundary tone (usually a final fall)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>Downstep (final lowering)</td>
<td>Peak of the word at the boundary is produced at a lower level than expected from effects of downstep alone, relative to pitch level of the previous peak</td>
</tr>
</tbody>
</table>

The cues “BD” are used at the end of all the utterances and they signal the both the end of the final phonological phrase, namely, the intermediate phrase and the end of the whole utterance (following Hellmuth, 2012: 10). The cues “H-PL” and “L-RPL” are used in phrasing the subject and the object.

2.4.1. Cues of the Subject:

The discussion above demonstrates that the cues “H-PL” and “L-RPL” are used 39 times in phrasing the subject at both subject-internal and subject-final positions as shown in Table (3) below:

<table>
<thead>
<tr>
<th>Subject-Final Position</th>
<th>Subject-Internal Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-PL</td>
<td>L-RPL</td>
</tr>
<tr>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td>H-PL</td>
<td>L-RPL</td>
</tr>
<tr>
<td>6</td>
<td>11</td>
</tr>
</tbody>
</table>

Table (3): The occurrence of “H-PL” and “L-RPL” cues in subject phrasing

Table (3) shows that the occurrences of “H-PL” cues are higher (20 out of 39) than these of “L-RPL” – (19 out of 39). However, “L-RPL” occurrences in subject-internal position take the lead (11 out of 17) over “H-PL” cues for the same position (6 out of 17). The reason behind the high occurrences of “H-PL” cues in subject-final position can be semantically and phonologically determined. Semantically speaking, the subject as a full syntactic unit, whether simple or
complex, can be accounted for as carrying considerable amount of the semantic entity of a sentence. So, the H-phrase tone expresses a further expectation for the rest of the information given by the remainder of sentence elements. Phonologically speaking, since the target sentence is previously known for the candidate as a statement that determines a final lowering, it is thought that balance in phrase tones interspersed amongst the edges of the utterance is additionally reserved. If part of the utterance ends with a H-phrase tone, the other part, especially the final phrase ends with final lowering tones – “BD”.

On the contrary, the high occurrences of “L-RPL” in subject-internal position can be semantically explained. The long subject that is said to include more than one intermediate phrase, each unit alone is expressed as a separate syntactic and semantic unit that requires a L-phrase tone which represents a unique entity within the bigger unit, namely, the subject as a whole.

2.4.2. Cues of the Object:

The occurrences of “H-PL” and “L-RPL” cues in object-internal position are equal in that both groups of cues are used 4 times each. Again the reason behind the occurrence can be, as discussed earlier, due to semantic and phonological consideration.

2.5. Conclusion:

The current study discussed how MSA sentences are intonationally phrased and the strategies and cues used in this process. The main results gained are that the longer the sentence, the more probable phrasing is very much likely to take place. Additionally, SVO sentence structure tends to be phrased as (S) VO rather than (SV) O, whereas the VSO structure tends to have the phrasing of (VS) O rather than V (SO) even when both of the subject and object are prosodically heavy and syntactically complex. Moreover, phrasing can be depending on various factors. First, the unit that is liable to be phonologically phrased can be any syntactic unit and that there is no strict condition for the size of any syntactic unit to form a separate phonological phrase even if it contains one single prosodic word “ω”. Second, each of the relative clause and prepositional phrase may very likely be phrased separately from the rest of the preceding elements of the sentence basically relying on whether or not it becomes a dependent argument for the preceding head within the same utterance. Third, balance in the constituent size concerning the number of prosodic words “ωs” in each phonological phrase is also an essential factor in the process of phrasing. Many candidates have opted to produce utterances that reserve the balanced sizes of each separate intonational phrase. Fourth, different intonational cues are used in phrasing. The cues “H-PL” demonstrate a higher level of occurrence
than the occurrence of “L-RPL” cues throughout the utterances, whether in the domain of the subject or object.

References


تحاول هذه الدراسة أن تبحث موضوع التقسيم التناغمي في الجمل العربية. والتقسيم التناغمي هو تقسيم الجملة إلى مجموعات محددة ذات معانٍ كاملة، وتفصل كل مجموعة عن أخرى مفاتها تناغمية معينة في أماكن محددة في الجملة. تقوم الدراسة على كيفية تقسيم سبع جمل عربية مختلفة التركيب أربعة منها تحوي التركيب النحوي "الفاعل – الفعل – المفعول به" وتتنوع هذه الجمل العربية في تركيبها النحوي الداخلي من خلال التنوع المستمر في طول عنصري الفاعل والمفعول به. وطلب من مجموعة من أساتذة قسم اللغة العربية في كلية الآداب في جامعة الموصل قراءة جميع هذه الجمل، وقد تم تسجيلها ومن ثم تحليلها بناءً على أهم العوامل التي من شأنها أن تؤثر على عملية التقسيم التناغمي في الجمل العربية.