Grammaticality of Intonation:
A Case Study of 'Tonality' and Clause Structure

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Abstract. This paper reports on the investigation of the interdependency of intonation phrasing and some grammatical constructions of an utterance. Tonality -as the basic component of intonation- is examined in order to assess its correspondence with the clause structure.

Two recorded texts of spontaneous speech (3308 words) made by male speakers of Arabic, in various language situations, are analyzed. More than 790 intonation groups are examined in conjunction with various grammatical constructions.

'One clause is one tone group" is a misrepresentation of the interdependency of the intonation and the grammar of an utterance. Findings suggest that interlocutors communicate, more informatively, by means of producing intonation phrases that coincide, at different degrees, with elements of a clause. Thus, tonality is best associated with element(s) of a clause rather than the clause as a whole.

Introduction

The correlation between the grammar of the utterance and its intonation is found to be more systematic than a simple tendency. The intonation-grammar correlation relates to the well-established linguistic fact that a speaker manipulates his pitch of voice, for various communicative purposes, in a systematic manner ([1]). That is to say, it is not the case that "no rules can be given for phrasing (intonation phrasing), except that the speaker must use his brain" ([2]). Furthermore, intonation phrasing suggests that a speaker

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([1]) K. Pike (1945), "General Characteristics of Intonation," in, Bolinger, ed., *Intonation: Selected Readings*, (London: Penguin Books, 1972); Quirk, *et al*. " Studies in the Correspondence of Prosodic to Grammatical Features in English", Proceedings of the 9th International Congress of Linguists (The Hague: Mouton, 1964).

([2])B. MacDonald, *English Speech Today* (London: Allen and Unwin, 1926),75.

Lafi M. Alharbi

paragraphs his flow of speech, by means of intonation, in a way to correspond with some structural principles, as hypothesized by Halliday, whereby "one clause is one tone group." ([3])

Halliday's hypothesis will be tested in this research. The aim of this research is to investigate the synchronism of an intonation system (tonality) and the grammar (clause construction) of the utterance. For this purpose, this research is divided into three parts: (1) The intonation-group boundaries in spontaneous speech will be identified on phonological and physical grounds. (2) The grammatical relevance of the elements constituting an intonation-group will be explored. And, (3) the degree of correspondence between tonality and various grammatical constructions, in spontaneous speech, will be examined.

Identifying Tonality

Intonation is recognized as a prosodic system, which is made up of systems (tonality, tonicity, and tone), which operates in conjunction with other systems of language structure ([4]). Out of these prosodic systems, I am primarily concerned with tonality, which refers to the division of an utterance into intonation groups. The term 'intonation-group' is used here in the sense indicated by Armstrong and Ward ([5]) where "connected speech consists of sense-groups, each of which is an intonation group." This notion of intonation phrasing is referred to in the literature in various ways. It is called intonation cues ([6]), breath groups ([7]), sense groups ([8]), tone groups ([9]), and tone unit ([10]).

([3]) M.A.K. Halliday, *A Course in Spoken English: Intonation*, (Oxford: Oxford University Press, 1970,3).

([4]) For further analysis of intonation systems, see Halliday, *Intonation.*.

([5]) L. Armstrong and I. Ward, *A Handbook of English Intonation* (Cambridge: Cambridge University Press, 1931).

([6]) D. Jones, *Intonation Curves* (Teubner: Leipzig of Berlin, 1909); W. Jones and Laven, J. Eds., *Phonetics in Linguistics, A Book of Readings*, (London: Longman, 1973).

([7]) H. Sweet, *A History of English Sounds* (Oxford: The Clarendon Press, 1906); M. Lieberman, "Intonation, Perception and Language,*" Research Monograph Series, no. 38*, (Cambridge: MIT Press.,1967).

([8]) L. Armstrong, and I. Ward, *A Handbook of English Intonation*, (Cambridge: Cambridge University Press, 1931); R. Kingdon, *"The teaching of English intonation"*. *English Language Teaching* 2 (1968) 85,113,141, and 3:11.

([9]) M.A.K. Halliday, "Intonation in English grammar", *Transactions of the Royal Philological Society.* (1966)*143*; M.A.K. Halliday, *Intonation and Grammar in British English*, (Mouton: The Hague, 1967); G. Brown, K. Currie, and J. Kenworthy, Questions of Intonation, (London: Croom Helm 1980); A. Fox. A Comparative Study of English and German Intonation, (Edinburgh: Edinburgh University Press, 1989).

([10]) Quirk, *et al*, *"Studies in the Correspondence of Prosodic to Grammatical Features in English"*, *Proceedings of the 9th International Congress of Linguists*, (Mouton: The Hague, 1964); D. Crystal, "The Linguistic Satus of Posodic and Pralinguistic Fatures in English", *Proc. of the University of Newcastle-upon-Tyne Philosophical Society*, series, B 1 (1966) 93; also, *Studies in the Prosodic Features of Educated British English with Special Reference to Intonation*, (London: University College, 1967); also, "Review of "Intonation and Grammar in British English", *Journal of Linguistics* , 5 (1969) 309; and, Prosodic System and Intonation in

To identify the intonation-group means to define its boundaries. Garvin writes "*defining the units means being able to ascertain their boundaries. The definition of a linguistic unit should be such that given a particular analytic input. The application of this definition should yield unequivocally the boundaries of the units so defined*"([11]). For a study, which investigates the systematic correlation between intonation and grammar, such as this, there are certain postulates, which ought to be observed. (A) It is not desirable to introduce grammatical considerations into the definition of intonation groups. (B) Phonological criteria, which are realized physically in certain phonetic cues (silence and frequency movement) are found to be the ideal measurement through which intonation groups boundaries can be identified. (C) 'Completeness' is the criterion, which the analyst must consider whenever phonetic cues fail to assist in placing intonation-group boundaries. In these circumstances, however, appeal has to be made to semantic and/or grammatical measurements of completeness, i.e., to take into account informatively and/or structurally complete units. This last criterion is introduced because of the broken nature of spontaneous speech where a large number of phonetic junctions are due to extra-linguistic factors ([12]).

Intonation-Group Boundaries

The intonation-group boundaries of the reading of scripted texts are expected to be clearly marked since readers usually produce fluent chunks of speech, which are comfortably retrievable. However, the issue becomes more difficult if we consider connected speech, conversation in particular. Considering physical correlates to determine intonation segmentation in speech is far more straightforward than semantic or grammatical criteria. However, they tend to be superficial in determining intonation-group boundaries. Brown et al([13]), in their acoustic investigation of the intonation phrasing of Edinburgh Scottish English, encountered a number of difficulties in identifying tone groups in spontaneous speech. Likewise, semantic and/or grammatical criteria, such as Kingdom's sense-groups and Halliday's one-clause to one-tone group, when taken alone to identify intonation-group boundaries, are too general to capture the significant contrasts made by intonational phrasing that a speaker uses in spontaneous speech. Alternatively, there are certain phonological entities, which are proven to demonstrate adequate identification of the boundaries of intonation-groups in connected speech. An external criterion (junctural features) and an internal criterion (the structure of the intonation-group) are both taken to be equally important in determining where the boundaries of intonation groups are. These are *pause*, the boundary cue, and *nucleus*, the obligatory internal element of an intonation group. This linguistic fact was first recognized by Crystal who suggested that "these phonological criteria suffice to indicate

English, (Cambridge University Press, 1969); D. Brazil, M. Coulthard, and C. Johns, *Discourse Intonation and Language Teaching,*. (London: Longman, 1980).

([11]) P. Garvin, "The Definitional Model of Language", In P.Garvin Ed., *Natural Sciences and the Computer,* (New York: McGraw Hill,1963).

([12]) For further analysis of spontaneous speech cues, see Crystal "Review," 22.

([13]) Brown *et al*., *Questions*, 46.

unambiguously where a tone-unit boundary should go in connected speech."([14]).

External Criterion (pause)

A stretch of speech sounds cannot flow continuously without some kind of interruption. A speaker may pause for a number of reasons. One pause may be for biological necessity (breath taking), another may precede and/or follow certain speech segments for emphasis, a third type of pause may occur to allow the interlocutor to take his turn, and a fourth type may occur because of hesitation, false start, or repetition. Questions like 'does a speaker pause whenever he needs to breathe?' and 'does a speaker breathe whenever he pauses?' are valid areas of research that have clearly different orientations than the work on hand. The prime concern in this research is to look for gaps in connected speech and cast light on their structural functions in demarcating intonation phrasing.

Two types of pause are accounted for in this research (three if we consider the turn-taking pause). The first type, which is called '?istiraaHaat' in Arabic([15]), is associated with speech phenomena like hesitation, false start, resuming control of the conversation, and repetition. This pause is recognized in connected speech as being filled with segments like [a], [u], or the repetition of the first segment of the intonation-group, and it is usually followed or preceded by semantically empty words like /ya9ni/, /biSaraaHah/, or /Taib/ which are conventionally translated (in terms of their pragmatic force) as 'that is', 'in fact' and 'ok, then' respectively. This type of pause is more frequent than other types. It principally functions as a holding device while the speaker arranges the remaining part of his utterance. I refer to this type by (...) (three dots) to indicate that the intonation group has not ended yet. It is very difficult to trace in a systematic way where this type of gapping may occur. However, I have observed some perceptible occurrences of this pause;

   (i) It occurs after the first element in an intonation-group where a speaker is searching for a particular word to express his message in a particular way. In this case, it is physically filled with either [a] or [u] and is sometimes followed or preceded by /ya9nii/, e.g. A   //(11) waa naDa9 ... ya9nii sum9ah <u>mumtaazah</u> lilfilm-alkuwaitii // 'We established an outstanding reputation for the Kuwaiti film.'
   (ii) It occurs at the beginning of the intonation-group, usually in an utterance-initial intonation-group, e.g. A //(48) faa ... faa ... fabidainaa min <u>6aak</u>-alayyaam min-assab9iinaat // 'We started, since the seventies, ...'. This gap takes either the form of repeating the initial segment of the intonation group where it occurs, or is filled with [u] or [a].

([14]) Crystal (1969) "Review," 205-206.

([15]) An-Nahaas, M'al-fawaaSil aS-Sawtiyyah fil-kalaam wa ?atharuhaa 9alaa al-mawaaqi9 an-naHawiyyah,' *Arab Journal for the Humanities,24.* (Kuwait: Kuwait University Press,1986).

The second type of pausing is physically identified as virtually zero vibration in the vocal cords. The places where this type of pause occurs are: (a) at the major constituent boundaries, referred to as 'waqf' (stop/silence) in Arabic, and (b) after the ultimate intonation-group, called 'sakt' (silence) in Arabic, which functionally takes the form of a turn-taking device and physically takes a longer time than the first type.This pause, which occurs at major constituent boundaries, is essential to the present investigation. This pause has been taken as an external measurement to mark the boundary of an intonation-group. It must be stressed that one cannot rely on pause alone to demarcate an intonation-group. Rather, when a gap occurs after a change of pitch direction and/or range, we speak of pause as a demarcation of an intonation-group. In other words, pause, as an external measurement, is taken simultaneously with the presence of a nucleus to mark the intonation-group boundary.

Internal Criterion (Nucleus)

An intonation-group is made up minimally of a syllable, which carries a pitch movement of some sort (a glide or a jump). The active change of pitch, which is referred to by Crystal as 'nucleus' and by Halliday as 'tonic,' is a mandatory element of an intonation-group. The presence of the nucleus is identified on two grounds. Physically, the nucleus takes the form of an observable change of fundamental frequency (pitch), i.e., the change in the rate of vibration of the vocal cords. Functionally, in each intonation group there is one and only one peak of prominence in the form of a major pitch change.

Two functional characteristics of the nucleus are used in this analysis to demarcate the intonation-group boundary. First, the presence of the nuclear syllable disambiguates cases where pause occurs within the intonation group, for reasons related to the nature of spontaneous speech. Secondly, coming after the first, it determines the boundaries between two adjacent intonation groups when the demarcating pause is very brief.

Data and Method of Analysis

This research answers questions, which are fundamentally related to the way in which a speaker of Arabic paragraphs his/her flow of speech by means of intonation. The investigation is focused on the degree of correspondences between tonality and clause structure and elements of clause structure.

The analysis will be arranged in the following sequence. First, the intonation groups of the examined spoken texts will be physically and functionally established. Second, the grammatical construction of each intonation group will be identified. Third, the intonation groups will be classified according to the corresponding constructions into the following five patterns:

1- More than one clause,
2- One clause of 'non-nominal' type,
3- A clause of 'nominal' type,
4- Elements of clause structure,
5- Miscellaneous constructions.

Fourth, the frequency of occurrence for each structural pattern (and its sub-patterns) will be traced. Finally, the general findings will be discussed.

The examined data consists of two recorded texts of connected/spontaneous speech made by two Kuwaiti speakers of Arabic, in two language situations. The two texts consist of 3308 words accommodated in 790 intonation groups. Throughout the discussion, examples are directly abstracted of the two texts. The examples are transcribed and translated into English.

Discussion of Findings

With respect to the correspondence between the identified structural patterns and intonation paragraphing, there are two significant observations. First, there is a high ratio of co-occurrence between a single intonation-group and elements of clause structure. This structural pattern occurs in 37% of the correspondences between grammar and tonality. In figures, there are 291 cases, out of 790 intonation groups, where an intonation-group accommodates part of an element, an element, or elements of clause structure. The second observation, which is second in the hierarchy of frequency, is when an intonation-group accommodates one clause. For instance, in 30% of the overall total of the examined data, (235 cases) an intonation-group accommodates a clause.

The following discussion illustrates the relationship between the structure of the clause and the intonation phrasing (see Table 1). The structural patterns are listed in a hierarchy of importance with respect to tonality. Elements of clause structure corresponding to an intonation-group are at the top of the list, with 291 cases representing 37% of the overall total of tonality. One-clause construction comes second in this hierarchy, as it occurs in 235 cases representing 30% of the total number of cases. More than a clause construction comes third in this hierarchy, with 122 cases representing 15% of the overall total. Adverbial responses (8%) and both wh-question types and listing (2%) come in fourth and in fifth positions, respectively.

Table 1. Number of structural elements accommodated in one clause

Elements of C	No. of cases	%/Total
Three	99	50 %
Four	65	33 %
Two	23	12 %
Five	10	5 %

The following discussion will highlight the relationship between each identified

structural pattern and the corresponding intonation paragraphing. The structural patterns are listed in a descending order, as established in the methodology section earlier.

Pattern One: More Than a Clause

This pattern comes third in the hierarchical order with regard to the correspondence between tonality and grammar (122 out of 790 or 15% of the overall total). A close look at this structural pattern suggests that a clause structure which is initiated with the cluster VS, is the highest in frequency of occurrence in this pattern (99 out of 211 clauses contained in this pattern, or 47% of the overall total). This indicates that verb-initial clauses are commonly used in spoken Arabic. It may also suggest that this particular word order is the most commonly used word order in Arabic. However, this grammatical phenomenon requires detailed structural investigation.

The second interesting feature in this pattern is that the two-element clause is more frequent (98 cases, 46%) than; (i) three- element clauses (67 cases, 32%), and (ii) four-element clauses (21 cases, 10%).

The third, and most obvious, feature of this pattern is that there is a high ratio of tonality accommodating two clauses (71 cases or 58% of the overall number of cases of tonality in this pattern). Second to this is the sequence of more than one-clause which appears in 42 cases of tonality (34%), and last is the sequence of three clauses which appears in 9 cases (7%).

Pattern Two: One Clause

One-clause construction requires careful handling for the reason that it has been frequently associated in the literature with tonality. As mentioned earlier, one-clause pattern comes second in the hierarchy of structural correspondence with tonality (i.e., 197 cases representing 25% of the overall number of tonality).

The clause construction consists maximally of five grammatical elements (10 cases, 5%) and minimally of two grammatical elements (23 cases, 12%). Three-element clause is of higher frequency of occurrence (99 cases, 50%) than other constructions in one-clause construction pattern. Findings, in this pattern, which are related to the number of structural elements accommodated in an individual clause, are tabulated in Table 1.

It is obvious in Table 1 that the three-element construction is the most frequent construction, followed by four-element, two-element, and five-element constructions, respectively.

As the Arabic language has relatively free word order, the elements of a clause change positions in such a way that they display various structural constructions. However, not all the theoretically possible word orders are represented in the data. Thus,

there are certain word orders, which are more common in spoken Arabic than others, and there are certain word orders, which are more restricted than others (Table 2). The most frequently used word order in each structural pattern will be identified below. The aim, here, is to report the most frequently used combination of elements in each sub-construction of one-clause structure.

Table 2. Word order constructions in the clause structure in spoken Arabic

(i) **Five-element Clause**

Pattern	No. of Cases
VS	7 /10

(ii) **Four-element Clause**

Pattern	No. of Cases
VSOA	14
VSOC	8
AVSO	6
VSAO	4

(iii) **Three-element Clause**

Pattern	No. of Cases
... VSO ...	39
... VSA ...	18
... SVO ...	12
... SVA ...	5
... OVS	5

(iv) **Two -element Clause**

Pattern	No. of Cases
SV	12
VS ...	11

Just as in pattern one, discussed earlier, the verb initial construction has the highest frequency of use in the one-clause construction pattern. It occurs in 114 cases (59%), whereas subject initial clauses occur in only 34 cases (18%).

Viewing the relationship between the elements of a clause and their positions in each intonation group, I will trace the frequency of verbs, subjects, objects, and adverbials below. Because of verb inflection for person, cases like: (1) /?ant taHDir-al9arD/ 'you, attend+you, the exhibition. 'You attend the exhibition.' and (2) /taHDir-al9arD/ 'You attend the exhibition', are all treated under the structure SVO. However, structures like (3) /taHDir-ant- al9arD/ and (4) /taHDir-al9arD-ant/ are VSO and VOS, respectively.

As the initial and final grammatical elements of the intonation-group are clearly marked, the middle-position element can occur in a position that ranges from the second to the penultimate positions, and by default it is excluded from the two-element

constructions.

Table 3 shows an obvious tendency for an intonation-group to be initiated with a verb (114 cases). Second to the verb-initial construction, there is a tendency for the subject to occupy the middle position (122 cases). Both objects and adverbs tend to be clause final elements (72 and 62 cases respectively). In conclusion, the above figures suggest that;

i) There is a tendency for the verb to come group-initial in an intonation group.
ii) The subject is likely to occupy the group-middle position in an intonation group.
iii) Both objects and adverbs have the tendency to come group-final in an intonation group.

Table 3. Elements of a clause and their positions in each intonation group

Pattern	5 elements	4 elements	3 elements	2 elements	Total
(A) Verb Sequence					
V...	2	34	67	11	114
...V...	8	31	27	NA	66
...V	0	0	5	12	17
(B) Subject Sequence					
S...	0	7	20	12	39
...S...	10	50	62	NA	122
...S	0	8	17	11	36
(C) Object Sequence					
O...	0	5	5	0	10
...O...	5	34	4	NA	43
...O	4	15	53	0	72
(D) Adverbial Sequence					
A...	8	19	7	0	34
...A...	6	15	6	NA	27
...A	7	32	23	0	62

The above statements by no means limit the occurrence of these structural elements to the assigned positions. Rather, they suggest tendencies for the position of each element. Out of 197 constructions, verbs occur initially in 114 cases, medially in 66 cases, and finally in 17 cases. Subjects occur medially in 122 cases, initially in 39 cases, and finally in 36 cases out of the total of 197 constructions containing subjects. Out of 123 constructions, adverbials occur finally in 62 cases, initially in 34 cases, and medially in 27 cases. Similarly, objects occur finally in 72 cases, medially in 43 cases, and finally in 10 cases out of 125 constructions containing objects.

Pattern Three: Nominal Clause

In this particular pattern (a clause with no surfaced verb), there is a split of the clause construction into three closely related patterns; non-nominal clauses, nominal

Lafi M. Alharbi

clauses, and elements of clause structure. The nominal clause has somehow an exceptional structure in Arabic. Therefore, it is worthwhile to look at this structural pattern, which is incompatible with English, and assess its correlation with tonality. It follows that the elements-of-clause pattern is dealt with separately, because it can be, in some parts, equally related to nominal and non-nominal clauses. This methodological split, however, does not affect the status of elements-of-clause construction, which comes first in the hierarchy of structural correspondence with tonality. One-clause construction, nominal and non-nominal, comes second in the hierarchy.

The nominal clause construction consists of a combination of S and C, and sometimes A. The two-element construction SC is more frequent (34 clauses, 90%) than other constructions in this pattern. Out of 38 nominal clauses, there are only 4 clauses which are made up of three elements, with one incident of each of the following constructions; SCA,SAC, ASC, and CSA.

Pattern Four: Elements of Clause Structure

There are two main reasons for identifying this pattern separately. First, it supports the comparison between the elements-of-clause pattern and the one-clause pattern as they correspond to tonality. Second, the frequency and the degree of splittability within this construction can be better investigated.

The elements-of-clause pattern is closely related to patterns two and three above. Thus, it contains grammatical constructions that are equally part of nominal and non-nominal clauses. However, in this pattern the speaker has preferred, for communicative emphasis, to split the structure of a clause into more than one intonation-group. The elements contained in this pattern are listed in Table 4 according to their frequency of occurrence with tonality.

Table 4. elements-of-clause pattern and their correspondences with tonality

Pattern	No. of cases	%/Total
1 element of CS	137	47 %
2 elements of CS	56	19 %
3 elements of CS	50	17 %
Part of element of CS	24	8 %
4 elements of CS	21	7 %
5 elements of CS	3	1 %

With regard to the structural correspondence with tonality, the elements-of-clause pattern is the most frequent of all. In more than one third of the number of tonality, intonation groups accommodate grammatical constructions of less than a clause. In figures, there are 291 cases (37%) where tonality coincides with elements of clause structure.

Out of various grammatical constructions in this pattern (Table 4), the one-

element pattern is the most frequent construction (137 cases in 47%). Table 5 illustrates a close examination of the content of the one-element pattern.

Table 5. The one-element constructions in pattern four

Pattern	No. of cases	%/Total
Adverbs	66	48 %
Objects	36	26 %
Subjects	20	15 %
Complements	15	11 %

Although communicative necessity, which motivates the structure of the message, is the most prominent factor that shapes intonation paragraphing, the distribution of the grammatical elements in this pattern shows the following.

(1) Adverbial phrases have the highest ratio of occurrence with tonality. Adverbials are most likely to be intonationally independent, especially if they come in clause-middle positions in lengthy clauses.

(2) Objects are second in this sequence, as 26% of the overall number of tonality accommodates objects.

(3) Subjects and complements tend to appear as part of a clause rather than being intonationally independent. Only 15% and 11% of the overall number of tonality in this pattern have the subject or complement, respectively.

It is possible that a speaker of Arabic may include two or three grammatical elements in an intonation-group (19% and 17%, respectively). Also, in cases where a clause is not included in a single intonation-group, either because of length or communicative necessity, part of an element may appear in a separate intonation group (8%). It is physically unlikely that four or five elements of clause occupy an independent intonation-group (7% and 1%, respectively). The reason, though, is that if the speaker intends to produce structural elements of such a length, it is both semantically and grammatically manageable to devote an independent intonation-group for each clause. However, communicative emphasis may cause an adverb of time, for example, which comes clause-final to be intonationally independent.

Pattern Five: Miscellaneous Constructions

There are 35 cases included under miscellaneous patterns. It seems that most of these cases, where the grammaticality of the utterance is disturbed, are due to hesitation, repetition, false start, and similar physical responses, which are naturally expected in spontaneous speech. The most common constructions that are accounted for in this pattern are adverbial responses, vocatives, listing, w-h and tag-questions.

A) Adverbial Responses

/na9am/ or /?ina9am/ 'yes or OK' are examples of expressive words which are used by Arabic speakers as responses which the listener would use in reacting to his interlocutor's flow of speech, indicating that he/she is listening, following, or agreeing with what he/she hears. Each expressive utterance stands for an independent intonation-group. Any language would not be spoken without some sort of conversational response, which varies according to a number of factors such as regional dialect differences, personal style and preference, level of the language used, language situation, type of discourse, etc. Nonetheless, the examined data exhibit two commonly used expressions; (a) /(?i)na9am/ 'yes, OK' (32 cases), and (b) /?ih/, /?ih tafaDDal/ 'yes, yes please' (25 cases).

B) Vocatives

There are three vocatives where a single-word utterance corresponds to a single intonation-group. The speaker chooses to separate these in disconnected chunks of speech for communicative reasons. The following examples illustrate the Arabic vocatives found in the examined data. /xaalid/ 'Kalid (name)', /?istaa6 xaalid/ 'Mr. Kalid', and /?umm xaalid/ 'mother of Kalid'.

It is worth noting that a great number of vocatives (12 cases, 75%) are incorporated within the structure of the clause in a single intonation-group, rather than being intonationally dependent. This phenomenon in Arabic contrasts with RP English where vocatives are likely to be set off from the rest of the clause taking the form of separate intonation groups ([16]).

C) Listing

The listing pattern includes nominal elements arranged in the form of series where each item constitutes an independent intonation-group. There are 15 cases reported here, and the most common examples are listed below:

        B //(17) ?annajaariin//
            'carpenters'
        B //(18) ?alqalaaliif//
            'people who caulk (a ship)'
        B //(19) maxaiTat-alib$uut//
        'tailors of 'bisht' (a cloak-like woollen wrap)

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[16] Quirk *et al*. (1964), 183.

D) WH Question Type

Under this pattern, wh-type elements occurred in group-initial or group-middle position with equal frequency of occurrence (6 cases, 40%). The group-final position is the least commonly used pattern (13.3% of the total of 15 constructions). Only in one incident does the wh-type word occur alone in an independent intonation-group. This happens in A//(203) lai$// 'why?' which is part of a lengthy utterance. Table 6 summarizes the frequency of occurrence for wh-type words.

Table 6. The frequency of occurrence for wh-type words

Pattern	No. of cases	%/Total
Wh...	6	40 %
...wh...	6	40 %
...wh	2	13 %
Wh	1	7 %

E) Tag-question Type

Only three cases of tag-question types are reported in the examined data. This suggests that tag-questions are not common in spoken Arabic. Even with this rare frequency, the interrogative element of tag-question is more likely to initialize an intonation-group (two cases out of total of three).

Conclusion

'How much of Arabic intonation can be described with reference to its grammar?' is the basic question that this research attempts to answer. No attempt is made, in this research, to provide answers to questions related to the Arabic grammar. On the contrary, the simplest grammatical forms are used to identify the structural constructions of spoken Arabic. The prosodic feature that has been examined in conjunction with grammar is tonality, which is physically identified as the way in which a speaker of Arabic paragraphs his flow of speech in such a way as to produce communicative blocks.

The central conclusion that can be drawn from this analysis is that, although the length of an intonation-group is highly affected by a number of situational/discoursal factors, Arabic speakers paragraph their flow of speech by means of intonation at grammatically relevant points. It is obvious to say that tonality coincides with various grammatical constructions ranging from a construction that is made up of three successive clauses to a single-word utterance. This interdependency of the intonation and the grammar of an utterance is sometimes misunderstood as some writers have restricted this relationship saying "one clause is one tone group"[17]. The data examined in this

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[17] Holliday, *Intonation,*

Lafi M. Alharbi

research renders no evidence for the occurrence of tonality with one specific
grammatical construction. On the contrary, Arabic speakers communicate more
informatively by means of producing intonation chunks that correspond to element(s) of
clause structure. The correspondence between an intonation-group and an element of
clause structure is found to illustrate the conventional tendency in spoken Arabic. Thus,
the fundamental conclusion here is that tonality in Arabic is associated with element-of-
clause construction and for that reason must be analyzed with reference to element(s) of
clause structure rather than to the clause as a whole. This conclusion complements[18]
suggestions that an intonation-group structure ought to be identified "in terms of
elements of structure"[19].

There are a number of variables within the element-of-clause construction that
correspond with tonality. A single-element construction is found to be relatively more
frequent than other constructions accommodated in a single intonation-group. This
single-element construction is exhibited in 228 cases, representing 36% of the total cases
of elements of clause structure (37% in Crystal's (1969,b) findings). The adverb
(including adverbial responses) is the most frequent single-element in this construction
(133 cases, 58%), followed by the object of the clause (36 cases, 15%). Taking into
account the fact that "information grouping may often conflict with, and override
syntactic groupings"[20], the elements of clause structure which correspond to tonality in
Arabic are distributed in a hierarchy of frequency–from the most to the least–as follows:

(1) Adverbial phrases are most likely to be intonationally
     independent, especially in clause-final positions in lengthy
     clauses.
(2) Objects are second to adverbs in being intonationally
     independent.
(3) Subjects and complements tend to appear as part of an intonation
     group.

The three-element construction comes second in the hierarchy of the
correspondence between tonality and grammar, representing 27% of the total tonality
cases (171 cases). Subsequently, the two-element construction is the third and the four-
element construction is the fourth in this hierarchy, respectively.
The analysis of the data shows that there is a relatively lesser number of cases
where an intonation-group corresponds to a grammatical construction more than a
clause. No more than 15% of the overall number of tonality cases, were reported where
an intonation-group accommodates more than a clause construction.

By and large, there is no systematic correlation found between the length of the
subject, or the predicate, of the clause and the length of an intonation-group. This issue is

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[18] Crystal, *Prosodic System*; and Quirk, "Studies."
[19] Crystal, *Prosodic Syastem*, 260.
[20] Fox, *Intonation*, 553.

unpredictable on grammatical grounds. It is totally dependent on the nature of the intended message and, of course, on the physiology of speech.

Appendix

Summary of Statistical Results

The following chart summarizes the correlation found between different grammatical patterns and tonality. It illustrates the frequency of occurrence of the structural patterns detected.

STRUCTURAL PATTERNS	text A	Text B	Sub/ total	%Sub/T	% Total
Three or more clauses	1	8	9	7%	
Two or more clauses	14	57	71	58%	
More than one clause	12	30	42	34%	
total			**122**		**15%**
5-element clause	4	6	10	5%	
4-element clause	23	42	65	33%	
3-element clause	21	78	99	50%	
2-element clause	8	15	23	12%	
total			**197**		**25%**
+2 elements of a nominal clause	1	3	4	10%	
2 elements of a nominal clause	5	29	34	90%	
total			**38**		**5%**
5 elements of CS	2	1	3	1%	
4 elements of CS	7	14	21	7%	
3 elements of CS	18	32	50	17%	
2 elements of CS	29	27	56	19%	
1 element of CS	57	80	137	47%	
Part of element of CS	14	10	24	8%	
total			**291**		**37%**
Adverbial Responses	4	63	67	47%	
One word utterance	1	3	4	3%	
Vocatives	2	1	3	2%	
Listing	0	15	15	10%	
. WH question types	2	13	15	10%	
Y/N question types	0	3	3	2%	
Unidentified	14	21	35	25%	
total			**142**		**18%**

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ملخص الدراسة. تبحث هذه الدراسة التحليلية في بيان العلاقة بين مقاطع الترنيم وفواصل التراكيب النحوية في الكلام. ولهذا الغرض حُلِّلَت أحاديث استقيت من اللغة العربية ، وذلك بواقع ما يربو عن ٧٩٠ مقطعاً من الكلام ، حُدِّدت مقاطعها الترنيمية بحسب نظرية النبر ، ومضاهاة هذه المقاطع مع ما يقابلها من تراكيب نحوية.

أفادت نتائج الدراسة بعدم دقة ما ذهب إليه هاليدي في زعمه بأن كل مقطع ترنيمي يقابله في الكلام جملة أو شبه جملة ، حيث بيّنت النتائج التحليلية لنصوص الكلام باللغة العربية أن قواطع الترنيم تنسجم من حيث التراكيب مع أجزاء من الجملة ، أكثر من انسجامها مع الجملة التامة.