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Phono-Syntactic Study of Headedness in Academic Lectures on YouTube:Evan Ashworth As a Sample

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Abstract:

Dependency phonology implies a great deal of interface between syntax and phonology that it shows interrelations at different levels of analysis. Thus headedness is the most important tie that holds the two fields. The current study deals with uncovering headedness at both modules of analysis syntax and phonological Form in order to define that kind of complementary aspect. Texts are taken from academic lectures on YouTube and analyzed in Praat to show prominence and parallelism with projection of syntactic tree diagram. Added to that, metrical trees are added to affirm the juxtaposition between headedness in syntax and phonology.

Key words: Dependency phonology, syntax , metrical, prominence, tone.

يتضمن علم الأصوات الملازم قدرًا كبيرًا من التفاعل بين النحو وعلم الأصوات، حيث يظهر العلاقات المتبادلة على مستويات مختلفة من التحليل. وبالتالي فإن الرأس هو أهم رابط يجمع بين المجالين. وتتناول الدراسة الحالية الكشف عن الوحدات الرئيسية في كل من جانبي التحليل النحوي والصوتي شكل من أجل تحديد هذا النوع من الجانب التكميلي. النصوص مأخوذة من المحاضرات الأكاديمية على موقع يوتيوب وتحليلها في برنامج (praat) لإظهار البروز والتوازي مع إسقاط مخطط الشجرة النحوية. يضاف إلى ذلك، يتم ربط الأشجار المترية لتأكيد التجاور بين الوحدات الرئيسية في النحو وعلم الأصوات.

كلمات مفتاحية: علم اصوات ,المتلازمة الصوتية , علم النحو المتري , البروز الصوتي , النغمة.

1.Introduction

In fact, most phonological theories of the 1980s may be described as quasi-parametric. That they followed and retained full apparatus of extrinsically ordered language-specific rules (i.e. constructions) of transformational grammar. But they made an increasing appeal to a few canonical templates (particularly at syllable and foot level) for restricting the application of those rules. These canonical templates were introduced as element of parametrization in the theory of language. The syllable template of a language, for example, was taken to be defined by universal principles(e.g. sonority sequencing, the obligatory character of the nucleus constituent).In an obligatory manner, they seem to interact with a number of binary parameters (e.g. codas permitted or banned, branching onsets permitted or banned). Furthermore, canonical templates were regarded as imposing persistent constraints on derivations and, to this extent, achieved similar effects to syntactic parameters(Burmudez-Otero and Honeybone,2006:550).

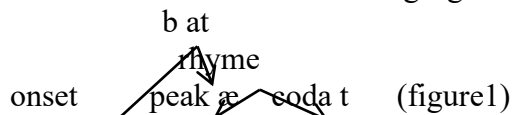
Dependency phonology is considerably a theory which hits to give headedness a pivotal role in both syntactic and phonological analysis. What syntax does, at this position, is to initiate content categories like nouns, verbs, adjectives, prepositions and adverbs that show importance in the any part of the sentence or even within the phonological phrase they occur in. Along with the syntactic headedness there must usually be the prosodic headedness which is usually triggered by the word categories mentioned above. Prosodic constituent headedness represents a crucial clue to the understanding of wide variety of phonetic and phonological features

within a sentence or an utterance. Furthermore this is carried out through pitch, intensity, loudness and voice quality (Elordieta and Selkirk, 2016:1).

Speaking of Dependency theory, it illustrates difference between levels of representation analysis, This variation in representation introduces the distinctiveness of the plane and the uniqueness of the substantive alphabet mainly those which specify the major elements (words and segments) which makes up the structure of an utterance. Although each level has its own determination and rules, like the constructive modules of syntax, semantics which by its role initiates the referential and logical values of lexemes and the phonological representation, there must be such a sort of interdependency among these levels. Phonology can be interpretive of syntax in this respect and has similarity of relevance of invoking relations in an interdependency sense (Ali, 2019:41). From phonological point of view, vowels construct the phonological head of the word and that promotes to phrases to build up heads in phrases formed by the syllables of nouns or other categories and even within sentences. These heads are surely to be schemed by syntactic distribution (Ibid:43).

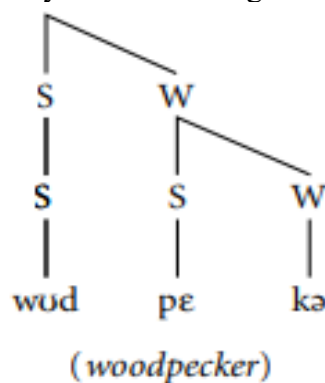
2. Headedness Principle in Phonology

As it is labeled by Radford (2004:69-70), headedness is constraint that governs every most content categories inside the structures of phrases and sentences. This envisions that every syntactic structure is a projection of a head word like a noun phrase must have a head in it represented by the noun. When it is attested to phonology, the same must be true for a phonological phrase which is composed by two elements or even one word like (bat) consists of two main elements one is the head represented by the nucleus /æ/ in the rhyme /at/ which accordingly can be schemed in the following figure:



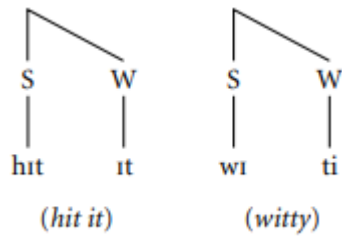
Another way to put it, is that the sub-segments of syllables have quite degrees of perceptual salience or prominence. In the meantime, the nucleus is more salient than the other parts of a syllable. This could be the reason why in many languages, coda consonants frequently faint in degree of obstruction, to the degree that makes the fade away altogether. The clue above prioritizes the nucleuses to heads in syllable words (Carr, 2013:68).

Monosyllabic functors, like pronouns (e.g. he, she, me, it), articles (a, the) and conjunctions (e.g. and, but, if) are typically not stressed. Therefore they are represented them with a weak salience or null and to be labeled as tails (i.e. as term usually used in phonology to mostly refer to unstressed parts of tone group or part of a word. On the other hand, nouns, verbs, adjectives, adverbs and prepositions are prone to have stress for two reasons. Firstly, they have some sort of lexical substantive and descriptive content and secondly they are the heads of larger tone groups or tone phrases (Radford, 2004:41). Thus, the noun wood in the phrase (woodpecker) has primary stress for being the head as shown in the skeletal structure below:



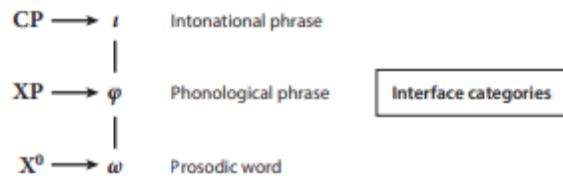
(Figure 2)

In more detailed combinations like sentences as there must be functors, the skeletal metrical representation of those categories is surely different as the verbs should occupy primary stress positions for being the heads of verb phrases as it is shown below (Carr, 2013:96):



(Figure3)

The syntactic input or its representation initiates both rhythmic and tonal structure of words and phrases aided by pre- and post-lexical rules. In other words, metrical analysis seems to interact directly with the grammatical constituents distributed via means of pitch variations on syllables of contentive words within phrases (Gussenhoven, 2004:296). Backley (2017:1) distinguishes between head elements and non-head elements via the manifestation of the asymmetric relations that characterize the phonological structure. Bennet and Elfner (2018:155) assume that in prosodic hierarchy theory phrasal phonology is not only being conditioned by syntax but by abstract phonological constituents known as prosodic representation. This prosodic representation in turn schematize categories that are derived from the syntax and come in different types (or “levels”), depending on what syntactic units they characteristically correspond to. As these prosodic categories are each derived from syntactic units of different sizes—at least clauses (CP), maximal projections (XP), and words (X⁰)—they too can be arranged into a “hierarchy” as can be shown in the following figure:



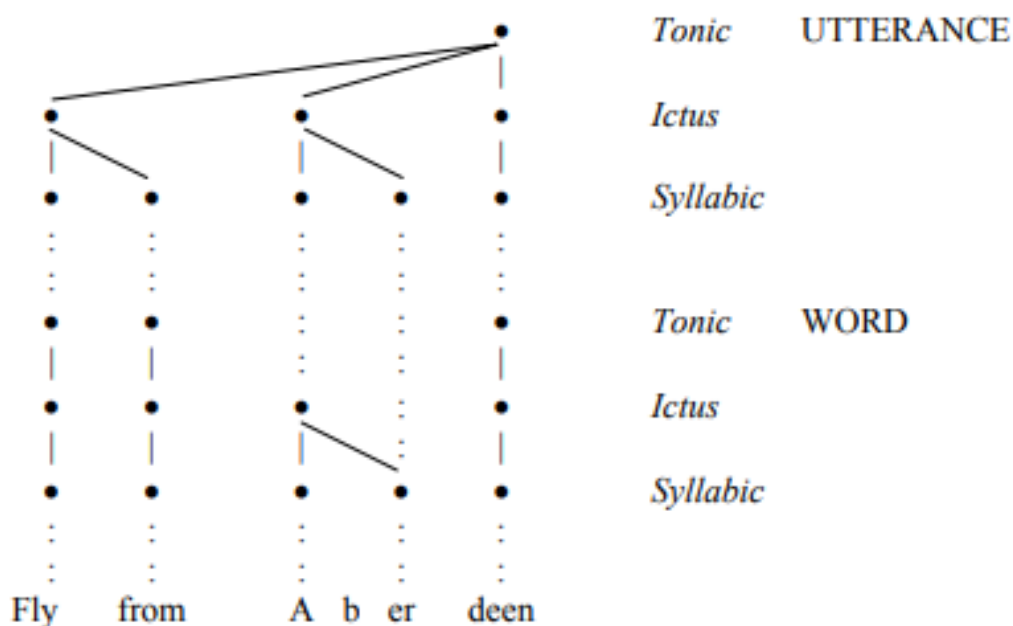
(Figure4)

Theories of the syntax–prosody interface which adopt prosodic hierarchy theory similarly assume that the constraints which govern syntax–prosody mapping are universal in nature. Thus, however languages might vary in terms of their surface syntactic structure and in the explicit marking of prosodic domains using phonetic and phonological processes, the grammatical mechanism underlying both the mapping of prosodic structure from syntactic structure and the hierarchical organization of prosodic structure into distinct prosodic categories is usually thought to remain stable across languages (ibid:159).

3. Metrical Representation in Dependency Theory

Metrical analysis can be conducted in DP at the suprasentential levels by investigating how larger structures can be formed initiating heads from segmental peaks onwards to larger tonal phrases. The idea to represent syllabic organization and stress in favor of dependency relations is seemingly related to the earliest DP versions. The syllable structure rules and the stress rules obviously have the common role of building successively more inclusive trees. Headedness was first asserted to converge with sonority peaks. These peaks configure sonorants heads of onsets and vowels heads of rhymes as it is mentioned earlier, but Anderson (1986) suggests to regard obstruents (sonority minima) as heads of onsets, an idea that can later be found in Government Phonology as well. At the supra-syllabic level, it is proposed by Anderson and Ewen that structures capture foot organization and prosodic organization at higher levels. This proposal is worthy being conducted to reveal, trees embody the notion of grid structure for word stress (Keith, 2006:12-13).

Consequently, the representations of grid structures instantiate quite detailed transplanar analogies which involve the dependency relation. There are also obvious intraplanar analogies that hold within phonology between lexical structure, or word structure, and the syntactic structure of utterances. The same constructional hierarchy seems to be appropriate in both domains, as illustrated in the representation for (Fly from Aberdeen) given in the following figure:



(Figure5)

Each level has its own element in particular domain. That the word or the utterance has the same successive constructions. That is, syllable convene with syllabic head, or peak; foot goes with foot-head, or ictus; and word or tone group, submits to tonic head (word accent or group tonic). (Subsyllabic structure is omitted.) Not all word accents or word tonics have an utterance tonic or even an ictus. English suprasegmental word structure is noncontrastive, and might be projected from the segmental content of the lexical entry for the word (Anderson, 2002:6).

Methodology

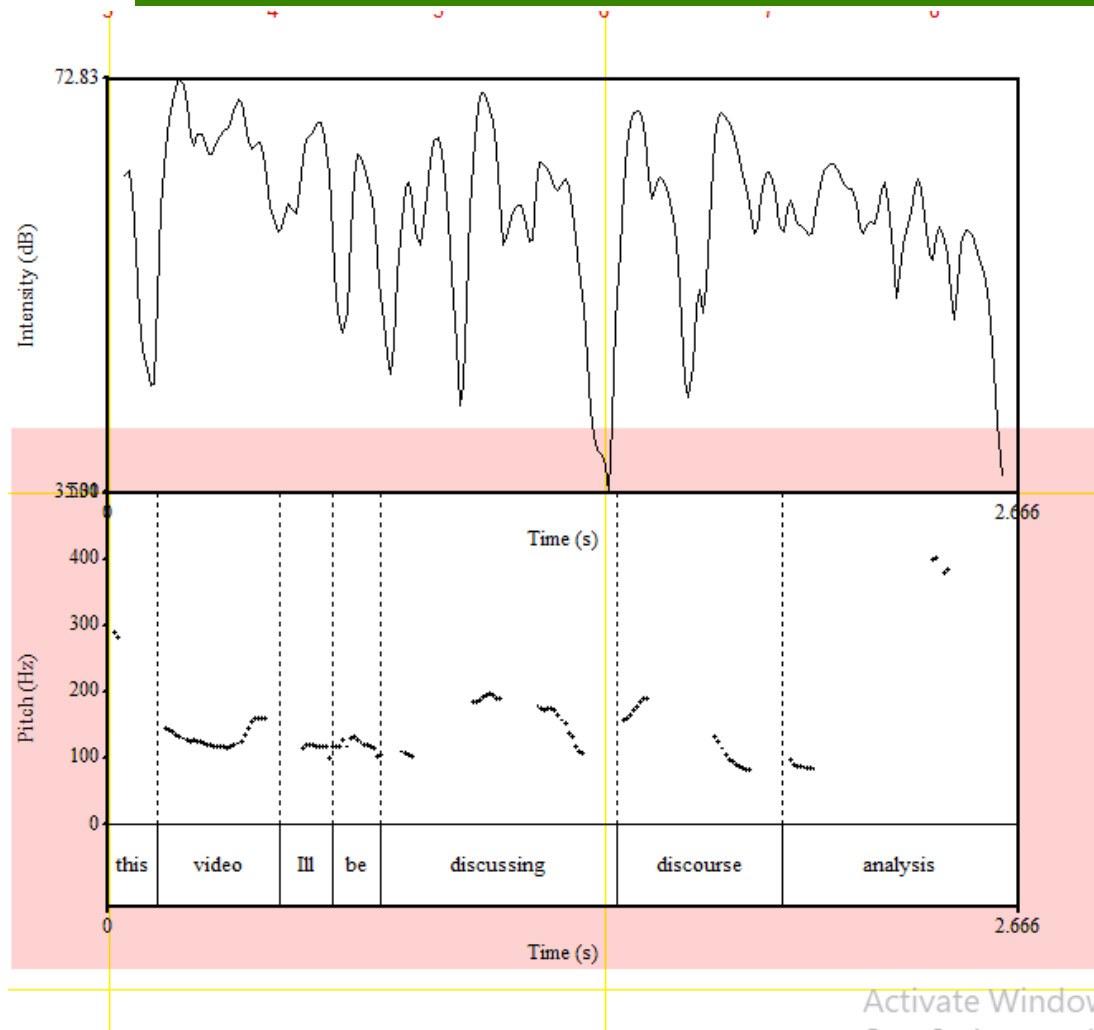
As it has been illustrated above, the suprasegmental analysis of DP is required to uncover the grid structure of tonal phrases or tone groups of contentive words within a phrase, sentence or an utterance. Since these types of syntactic categories has special salience or prominence within any kind of structure they occur in, headedness is being extracted as the main objective for the current study. The academic lectures on YouTube must be a convenient sampling for the data collected. The reason why academic lectures are selected is that they represent a rich resource of information structure containing various forms of foregrounding and strategies of introducing topics, themes and connecting them to their rhemes.

Data analysis mainly depends on implementing praat spectrographic analysis of whole contours for the speakers sentences. The two main prosodic features that are extracted are represented by pitch contour and intensity contour in order to get a reliable skeletal metrical analysis of the DP schema. Hence sentences are selected and analyzed to into praat text grid .Noun phrases, adjectival phrases and prepositional phrases are selected to first initiate their salience as part of the whole contour and to analyze each phrase with its successive levels starting from syllables to the upper level at phrase structure or tonic words. Peaks are considerably taken as parts of syllables because this study focuses on the entwining the tonal structure of phrases with heads within those phrases initiated by syntactic input. Thus the grid is expected to be composed of complex nodes depending upon the construction of those phrases introduced in the data selected. Prosodic hierarchy theory could also be used or put into consideration in order guide the right metrical grid for more accurate and hierarchical sonority represented by peaks within the syllable. It also converges with the XP theory projections in initiating headedness as it is mentioned above. Another way to put it, the latter theory represents a counterpart of interface of phonological phrase which are both part of linguistic theory.

4. Texts and Discussions

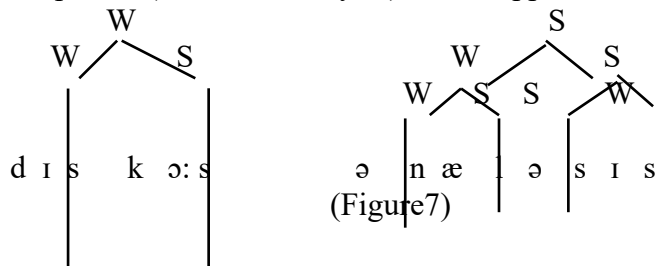
4.1 Text 1:

-This video I'll be discussing discourse analysis



(Figure6)

According to praat reading above, it is noticed that all nouns occupy the highest points in both pivots (i.e intensity and pitch). These words can be the arguments (*this video*) although the functional word (*this*) is not as prominent as the words like , *discussing*, *discourse* and *analysis* that represent heads in the sentence. The noun phrase (discourse analysis) can be applied to metrical grid as in the following figure below:

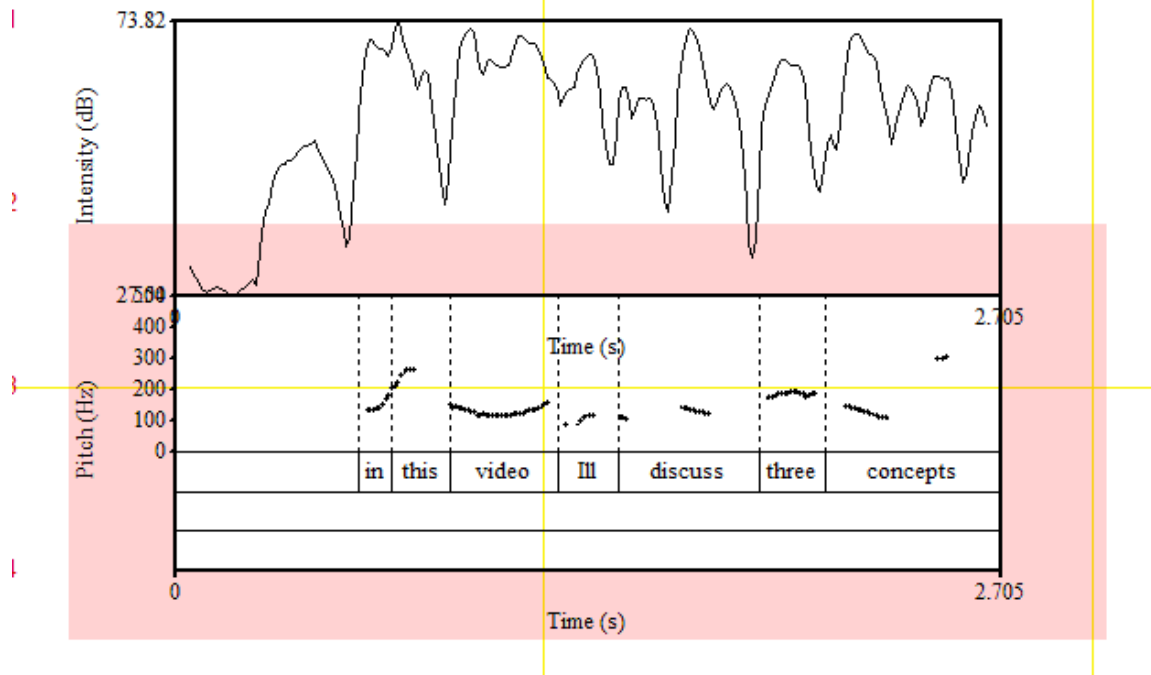


(Figure7)

As possessive construction phrase the word discourse is the noun head of it which scores about 185 Hz as pitch frequency and seemingly on the first syllable that contains a short vowel peak representing the minimum head in the whole word. Added to that, the word analysis also scored a bit high pitch range but it is slightly lesser than the former word and that is being placed on the second strong syllable which also contain short vowel as a peak.

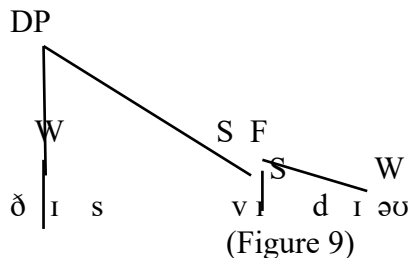
4.2Text 2:

-In this video Ill discuss three concepts.



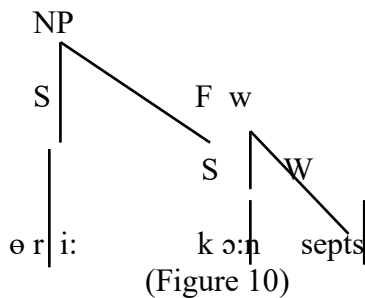
(Figure8)

The figure analysis above shows that the highest scores of pitch and intensity are scored by head contentive words than functors. These are video, the head verb (*discuss*) of the verb phrase (*will discuss*), the adjectival phrase and its head three (i.e. three concepts). However, the determiner (*this*) records a respectable high level of pitch representing the head of the determiner phrase (*this video*). So they can share one node as shown in the following metrical tree:



(Figure 9)

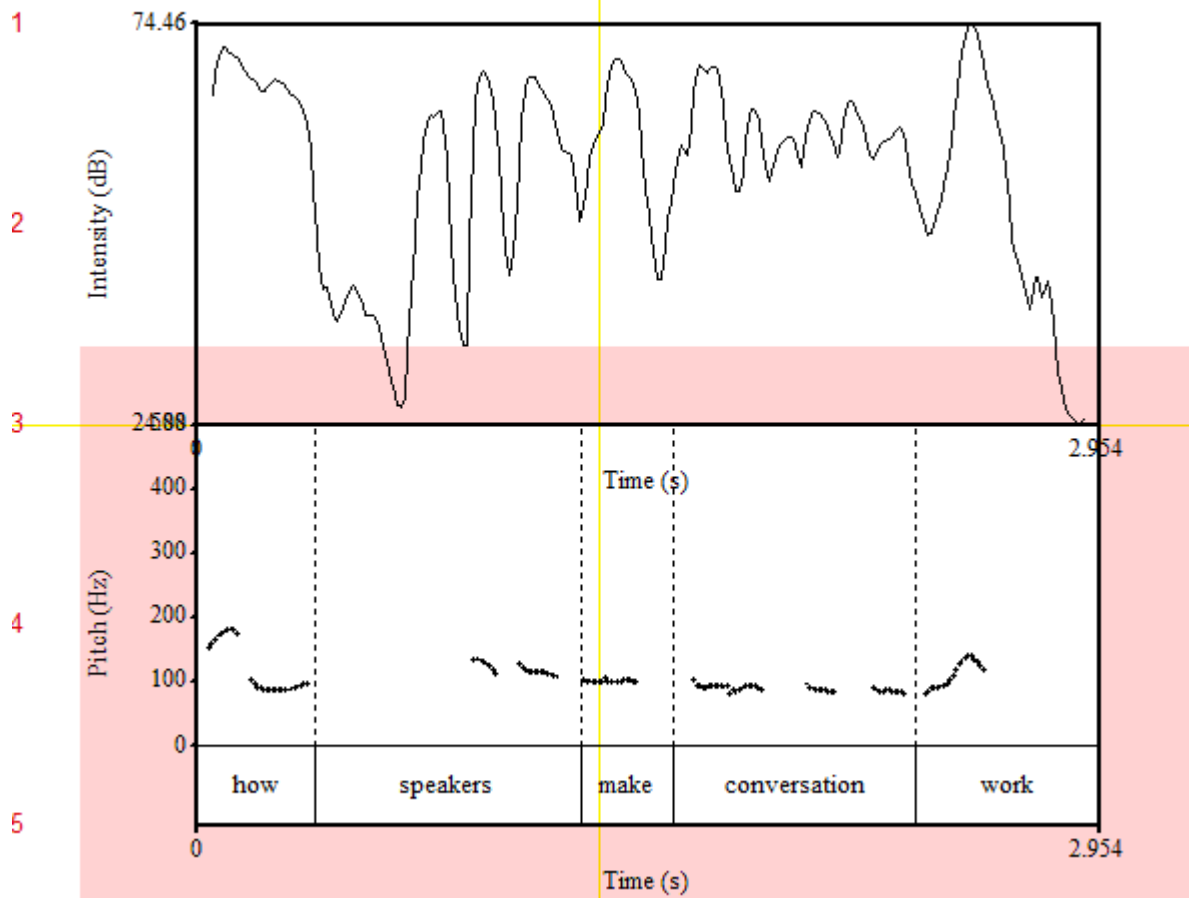
As for the noun phrase (*three concepts*) has the same structure above that the quantifier (*three*) received more prominence than the noun (*concepts*) due to the focus the speaker wants to present as new given information:



(Figure 10)

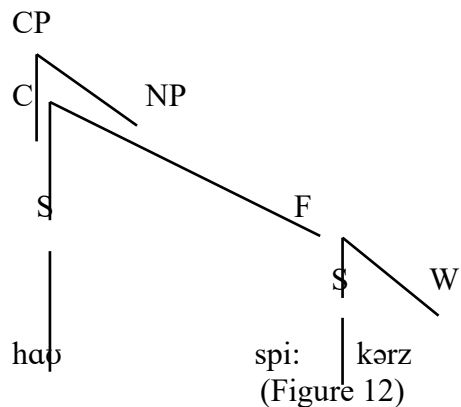
4.3 Text 3:

-How speakers make conversation work.



(Figure 11)

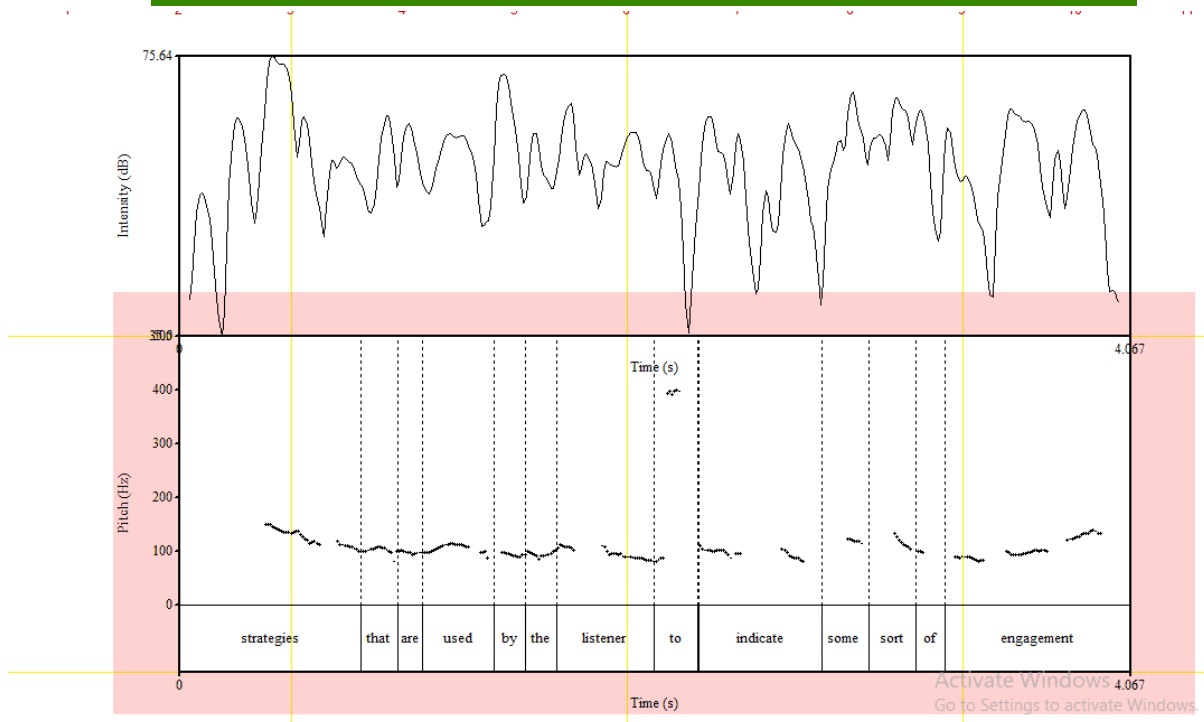
The analysis of the clause above shows that the nouns as arguments of verb phrase (make) which are (speakers) and (conversation) is being headed by the same verb. They manifest slightly neutral contour or tonic structure. What is worth mentioning here, is that the complementiser (how) records the second high point of the whole contour above. Thus it is taken to be analyzed as whole phrase with noun (speakers):



It is obvious that both peaks like /aʊ/ and /i:/ as the minimal heads of the syllable make the intensity and pitch higher since they are more sonorants than onsets and codas. That the word(how) records 228 Hz as a pitch range and the words speakers is about 120 Hz as a part of the complementiser phrase.

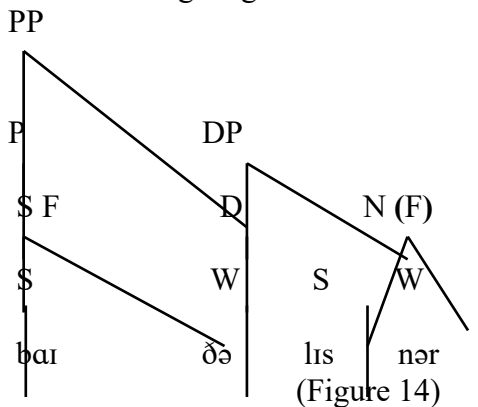
4.4 Text 4:

-Strategies that are used by the listeners to indicate some sort of engagement.



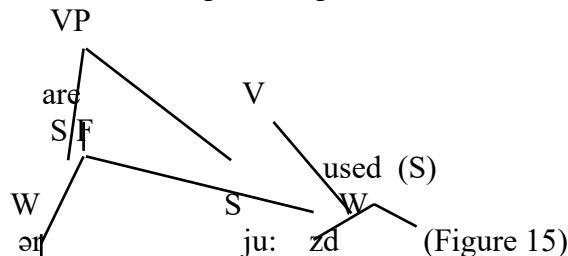
(Figure 13)

As shown by praat picture above the, the preposition (by) in the phrase (by the listener) uses approximately high salience nearly close to that of nouns. It is nearly more than 105 Hz. The tree notation requires the following diagram:



Both the preposition, the head of the phrase and the noun show the same prominence and supported by the their minimal salience centered in peaks represented by vowels /aI/ and / I / in the first syllable of the word (listener).

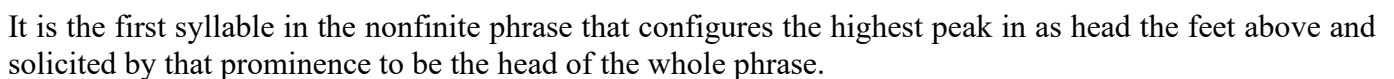
On the other hand, verb phrase (are used) in which the verb (used) is the head of the phrase also has high point of prominence. This simple verb phrase consists one foot as in the following diagram:



4.5 Text 5:

-Establishing terms is determined through verbal and nonverbal cues.

Two elements of the text above are useful for the current process of analysis. The first one is crystallized by the nonfinite phrase (establishing terms). In this phrase the pitch ranges to 250 Hz upon the prominent syllable in the word establishing. The details can be annotated in the following diagram:



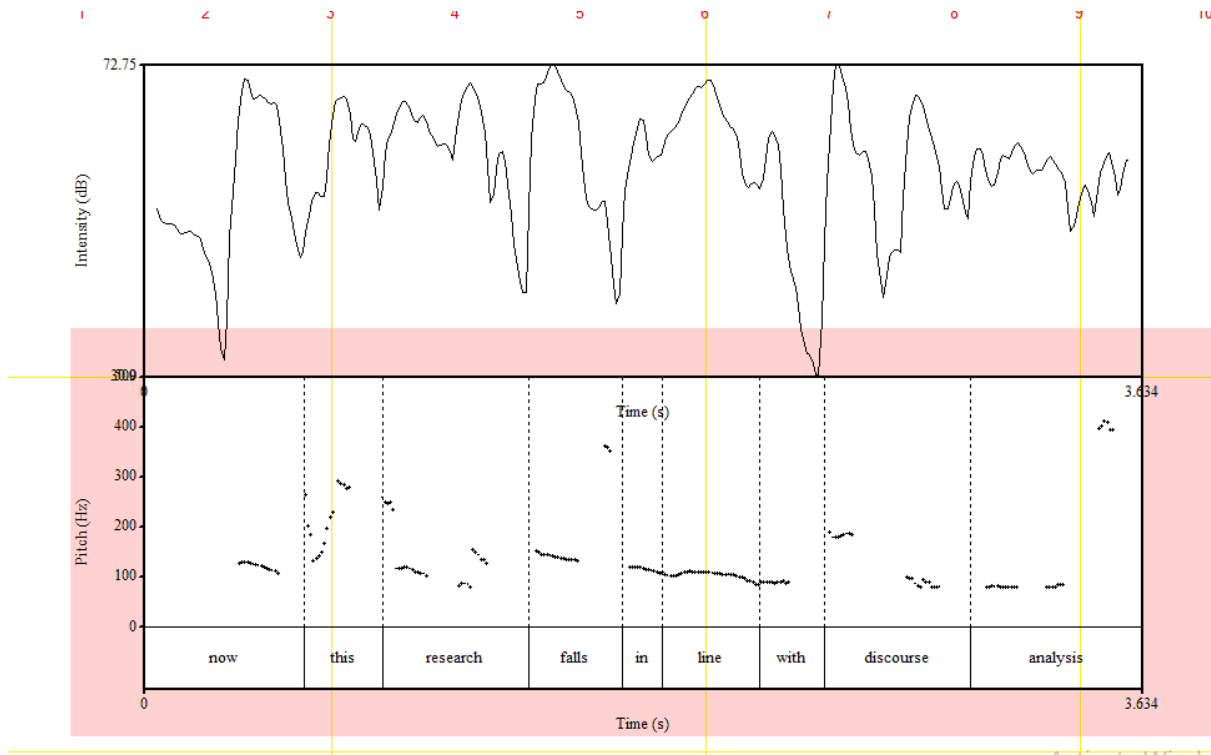
The second phrase that possesses headedness is the adjectival phrase as illustrated in praat text grid (nonverbal cues) and as it is displayed by figure 16 above, the pitch approximately ranges at 142 Hz at the second syllable creating a minimal head peak. The phrase can be exemplified in the following diagram :



Since the first syllable is a prefix it receives secondary stress and primary stress more likely on the long vowel on the penult and representing the head peak as well.

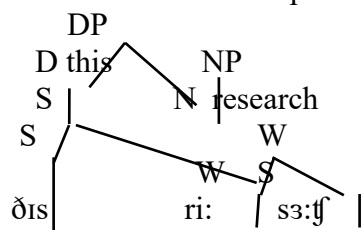
4.6 Text 6:

-Now this research falls in line with discourse analysis.



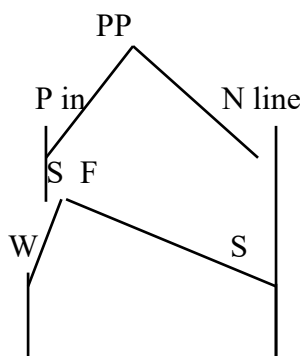
(Figure 18)

The spectrographic analysis above, clearly shows that the head parts of phrases have higher pitch ranges than their counterparts. For instance, the determiner in the phrase (this research) has level of almost 300 Hz which is syntactically labeled as the head of the phrase. Secondly, the preposition in the phrase (in line) also has ranges to approximately 112 Hz as being the head of the prepositional phrase. And third, the noun discourse in the phrase (discourse analysis) which is being analyzed earlier as a theme has 180 Hz on the first syllable of the word (discourse) because it is the head of the phrase. Two phrases are metrically analyzed in this section , the first one is the noun phrase mentioned above as it is schemed in the following figure:



It is sometimes controversial to reconsider that the noun in the DP is the head but the praat analysis shows the determiner more prominent than the syllables in the noun. The first syllable in the noun though it contains a long vowel and receives secondary stress, it is still headed by the second syllable whose peak is /3: /.

The second phrase represents the prepositional phrase (in line) which is headed by the preposition (in).The head portion scores approximately 108 Hz which is a bit lower due to being a weak form in the course of the speech chain rather than its noun part (line).They can metrically schematized in the following diagram:



in lam

5. Conclusions

Throughout dealing with such a study by which a process of entwining phrase structure analysis and metrical grid schema, there are some points to sum up as concluding remarks. Firstly, it is noticed that contentive words like, nouns, adjectives and prepositions occupy high ranges in both pivots of praat analysis crystalized by pitch and intensity sections. In this regard, headedness is not only syntactic tree diagram but it is also projected at the phonological representation level. This implies that both phonological form and logical form (i.e lexical input of contentive categories) are required for manifesting a thorough identification. Secondly the conceptions of dependency phonology also represents a crucial leading constraint to headedness which clearly initiates the componential and substantive phrases at the suprasegmental level and on its part configures the phonological representation.

Regarding the segmental input, as it should thirdly be mentioned, peaks play important factors that give rise to the headedness in both segmental and suprasegmental levels. At segmental input they are considered as heads of syllables with which they form tonal phrases within the syntactic phrases in order to highlight whole heads of constituents and they also illustrate higher levels of pitch and intensity as segmental portions. This implies that, there must be a trajectory followed according to prosodic hierarchy theory which maps segments from minimal units like phonemes to more larger and complicated tonal phrases. So, it is found that this kind of hierarchy is something nearly simultaneous as if it is being mapped by both modules grammatical module and phonological one. Fourthly, as it is attested to praat analysis, tree diagram schema and metrical analysis, the current study shows that most contentive words that fall in phrases of tree diagram contain strong syllables which are the heads of the feet within these phrases. Although the speaker sometimes usually pronounce prepositions as weak forms and the nouns in such phrases might be more prominent than other parts. And fifthly, the feet are built within and cross boundaries of the categories of the phrases so as to keep both the balance of stressed and unstressed syllables and binarity projection of tree structure in order. Thus it showed a fruitful results that syntactic heads also consist of strong syllables which are the heads of feet as the metrical analysis illustrates.

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