A Study of the Syntactic Phonological Interface in English Sentence Form

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This study endeavours to shed light on the interface between syntax and phonology, i.e., two of the principal levels of linguistics. This investigation revolves around the following questions: (1) Is it correct to argue that syntax and phonology are interrelated? (2) Does syntax override phonology in English sentence construction or vice versa? It is assumed that syntax is more powerful than phonology and emphatic transformation mainly affects sentence stress. This work is limited to the transformation of simple and complex sentences in relation to emphatic and contrastive stress. The main results of this study have evidently shown that: (1) Simple and complex sentence transformational rules basically illustrate the connection between syntax and phonology. (2) The phonological stress rules are conditioned by transformational rules. (3) The phonological stress rules require information concerning the syntactic category of a word (4) The analysis has shown that there is evidence that syntax dominates phonology in English sentence construction.

Keywords: *Syntax, English, Phonology*

Introduction

One topic that commonly finds a place in the discussions of the status of linguistics is the interaction between the different domains of linguistics such as the syntax-phonology interface.

On terminology, Yule (1996, p.100) indicates that "if we want to concentrate on the structure and ordering of components within a sentence, we are studying what is technically known as the 'syntax' of a language". With respect to phonology, Jurafsky and Martin (2000, p.92) explicitly state that "phonology is the area of linguistics that describes the systematic way that sounds are differently realised in different environments, and how this system of sounds

is related to the rest of the grammar". It is worth considering the two basic units of grammar , i.e., the word and the sentence (Huddleston, 1990,p.1).

As a matter of fact, the interface between 'syntax' and 'phonology' is a fertile area. It lies in "the putative boundary between the domains of phonology and syntax. The nature and location, and the very existence, of boundary have often been vexed questions" (Trask, 1996, p.277).

The issues that will be discussed in this study centre around 'emphatic transformation' and 'sentence & contrastive stress'. The simple sentences such as affirmative, negative ('not'), imperative, and interrogative will be fully examined and analysed in terms of tree diagrams. The complex sentences, on the other hand, are discussed in terms of the 'assertion of new/ contrastive information'. In this regard, 'stress and asserting new/ contrastive information' can be best seen in the following transformational rules: the passive transformation, particle movement transformation, extraposition transformation, and the cleft transformation. Both transformational and phonological rules are employed to illustrate the interface between syntax and phonology. This study is an attempt to answer the following questions: How far is it true to argue that syntax and phonology are interrelated? Does syntax override phonology in English sentence construction or vice versa?

The Syntax – Phonology Interface in English Sentence Making

The term 'interface' is defined by Onions (1998, p.481) as "a means or place of interaction between two systems, organisations, or disciplines, etc." On the same term, Hornby (2000, p.709) points out that "the interface between A and B, for example, is the point where two or more subjects, systems, processes, etc. meet and affect each other".

Syntax and phonology are interconnected to some extent. Though syntax and phonology are definitely distinct levels, nevertheless the grammar and pronunciation of a language cannot be fully described in disjoint vocabularies with neither description making any reference to the categories employed in the other(Butt and King, 1998, p.3).

Thus, the interface between syntax and phonology in the construction of the English sentence will be illustrated in 3.2 and 3.3.

The Emphatic Transformation

At the outset, it is useful to state that the kind of transformation which is called 'emphatics' follows the same general pattern of the Yes/ No Question and Negative Transformations. This becomes apparent in the statement that "the result of this transformation is readily

apparent in the stress patterns of spoken English. It can only be shown in written English by underlying or using some other devices for indicating heavy stress on a word or words" (Herndon, 1976, p.163).

It is important to state that emphatic stress is different from contrastive stress in that the former serves to reaffirm the truth of the basic sentence. The latter, on the other hand, places the stressed word in opposition to some other idea as shown in the following examples:

(1) A- She is a good swimmer. (emphatic stress)

(There can be no doubt about i).

b- She is a good swimmer. (contrastive stress)

(Rather than being good at something else).

is / iz /   ;   swimmer /swim ∂ /

Herndon (1976, p. 163)indicates that the extra measure of affirmation, called 'reaffirmation'. Accordingly, he suggests another name for the emphatic transformation which is the 'Reaffirmation Transformation'. This reaffirmation may be added to, for example, any kernel sentence in English. The addition in each case is a matter of stress. Furthermore, the point at which stress is added to a kernel sentence to produce reaffirmation is determined by the auxiliary elements that appear in the kernel sentence to be transformed.

All kernel sentences are affirmative. Laying heavy stress at a given point in such a sentence reinforces this affirmative quality of the sentence as shown in the following sentence:

 (2) you can do it.

   can / kæn / (strong form)

Sentence (3.2) may be given an extra measure of instance with the addition of extra stress on 'can'.

From such considerations, the rules that indicate the reaffirmation are as follows. The added element of stress is symbolised here by the abbreviation 'Reaf' (Ibid.).

NP t M X $\Longrightarrow$ NP t M Reaf X

NP t have X $\Longrightarrow$ NP t have Reaf X

NP t be X $\Longrightarrow$ NP t be Reaf X

NP t V X $\Longrightarrow$ NP t Reaf V X

Notice that the last line of the transformation dictates the use of the 'Do Transformation':

 t $\Longrightarrow$ do t

The following sentences represent this rule:

 (3) She studied for the test.

 (4) She did study for the test.

did / d i d /

It is important to note that the choices of more than one optional auxiliary element will not affect the application of the rules (Ibid.:164).

In particular, when no other auxiliary verb is available in the surface form of contrastive emphatics, the auxiliary is introduced to support 'tense', as in the following sentence:

(5) You did buy a crowbar, don't you remember ?
In this example, contrastive stress indicates emphasis (Traugott and Pratt, 1980, p.152).

Consider the following terminal strings:

    The girl pas can be – ing help her friend .
                               |_____|

    NP   t   M   X
    The girl pas shall have – en be – ing   help her friend .
                                  |_____|

    NP   t   M   X
    The girl pres have en be – ing   help her friend .
                              |_____|

    NP   t   have   X

Application of the 'Yes / No Question Transformation' and the 'Affix Transformation' to each of the above terminal strings will produce:
(6) Could the girl be helping her friend?
(7) Should the girl have been helping her friend?
 (8) Has the girl been helping her friend?

The application of the Reaffirmation Transformation and the Affix Transformation together to each of the kernel sentence, the result will be as follows:
(9) The girl could be helping her friend.
(10) The girl should have been helping her friend.
(11) The girl has been helping her friend.
   could / kud / ; should / ∫□ud / ; has / hæz/ (strong form)

In fact, the orderly nature of these three transformations demonstrates the systematic nature of the rules of English syntax (Herndon,1976, p.164).

When the Emph element is part of the basic sentence string, it initiates an obligatory transformation that orders extra stress at a specific point in the string. The following rules reflect the above consideration:

Emph   NP   t M   V$_T$ NP
Emph   NP   t have – en V$_I$
Emph   NP   t be – ing V$_T$ NP
Emph   NP   t be   NP
Emph   NP   t   V$_T$ NP
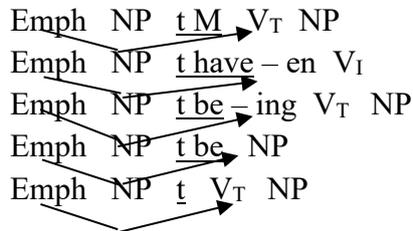
See the movement of the Emph marker to order heavy stress in basic sentence strings. The PS – rule which states: S ⟶ NP VP is used for this purpose (Ibid.).
Below, is the full Emphatic Transformation:
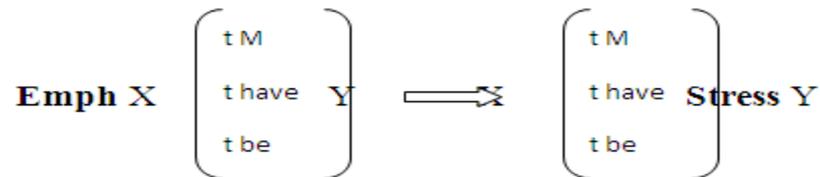
Again, the Do insertion rule:
t # ⟹ do t #   (Herndon,1976:165)
The sentences below indicate different constructions:
(12) The pupils are becoming apathetic. (affirmative) .
(13) Are the pupils becoming apathetic? (interrogative).
(14) The pupils are not becoming apathetic. (Negative).
 (15) The pupils are becoming apathetic. (with Emph).
        are / a : /

In this connection, Thomas and Kintgen (1974, p.193) believe that sentence emphasis suggests the exasperation in the sense that it is possible to emphasise any word in a sentence by putting heavy stress which usually accompanies the high pitch. Consider the following sentences where stress is placed on different words:

 (16) a . Jeff is here.
      b . Jeff is here.
      c . Jeff is here.
      Jeff / d3ef /; here / hi∂ / ;   is   / i z /

The first sentence might be the reply to (who is here?) , and the second sentence might be a reply to (where is Jeff?), whereas the third sentence is somewhat different ('is' is stressed). It

suggests that the entire sentence be emphasised, as though it has already been stated that (Jeff is here) but that the listener keeps assuming that it is not true that (Jeff is here) – exasperation. Thus, stress is very important in the English language. Failure to observe it would often prevent communication or cause blunders.

They (Ibid.) add that the distinction between the different emphatics parallels the distinction between different negations: it is possible to negate or emphasise a particular element in a sentence, or to emphasise or negate an entire sentence. Consider the following sentences:

 (17) John will go home.
 (18) John has gone home.
will / wil/ ; has /hæz/ (strong form)

Having examined the aforementioned sentences, it was found that the stressed element either takes a form of (be , have) or a (modal). As with the negatives, it is important to insert a marker after tense t (Aux). If there is an element of 'Aux', then it will receive the stress. If there is not, the marker will trigger Do Insertion since the tense will be followed by the emphatic marker rather than a verbal element. Therefore, the form of 'do' will be stressed. Furthermore, as with the question and negative transformations, "a sentence modifier should be added to the deep structure that tells the semantic component that the sentence is emphatic and ensures that it goes through the emphatic transformation" (Ibid.:194).

Emphatic (obligatory)
Emph – X – t (Aux) – Y $\Longrightarrow$ X – t (Aux) + Emph – Y; Aux =

be; M ; have dominated by Aux

After the application of this rule , the following strings will be produced:
John + Pres + be + Emph + here.
John + Pres + will + Emph + go + home.
John + Pres + have + Emph + en + go + home.
John + Pas + Emph + drive + home.
John + Pres + Emph + love + Mary.

The Do insertion will apply to give the following PS- rules:
John + Pas + do + Emph + drive + home.
John + Pres + do + Emph + love + Lucy.

What is needed here is a rule to convert this 'Emph' into primary stress on the preceding word. This is a phonological rule, part of the phonological component, which assigns the proper stress to strings (Thomas and Kintgen,1974, p.195).

(19) John did drive home .
(20) John does love Lucy .
did / d i d / ; does / d ∧ z / (strong form)

To see the order of 'Emph' and 'Neg' , the following sentence is derived:
(21) John will not go home .
not / not /
Emph + Neg + John + Pres + will + go + home

Notice that if ' Neg' is firstly applied , then 'Emph' to sentences, the following order is obtainable:

Emph + Neg + John + Pres + will + go + home   ⟹ (Neg)
Emph + John + Pres + will + not + go + home   ⟹ (Emph)
John + Pres + will + Emph + not + go + home

After 'Affix' (pres+ will) and stress placement , this will get :
    (John will not go home) .

This sentence is grammatical, but it stresses the first element 'will', rather than the whole sentence. Therefore, it is an example of element emphasis (Ibid.). If ' Emph' is applied first, this will become:

Emph + Neg+ John + Pres + will + go + home   ⟹ (Emph)
Neg + John + Pres + will + Emph + go + home   ⟹ (Neg)
John + Pres + will = not + Emph + go + home

After 'Affix' (pres+ will) and stress, sentence (3.21) is obtainable . Therefore, 'Emph' must be ordered before 'Neg' and also 'Neg' follows the question transformation and then that 'Emph' follows them. What is important here is that the emphatic stress deletes the 'Emph' marker and places heavy stress on the preceding word as exemplified in the previous sentences.

Finally, the full emphatic transformation is as follows:
Emph - X - t (Aux) - Y ⟹ X - t (Aux) - Emph - X

Bornstein (1977, p. 153) argues that a dummy node distinguishes the deep structure of the emphatic sentences from that of their positive counterparts. Consider the surface structure of the following sentence:

(22) Jim will be on time.

The emphatic transformation places the 'Emph' marker after tense and the auxiliary verb (Ibid.: 154). Specifically, a phonological rule places heavy stress on the word that precedes the marker. When an auxiliary verb is present, it receives heavy stress as illustrated in the following tree diagrams:
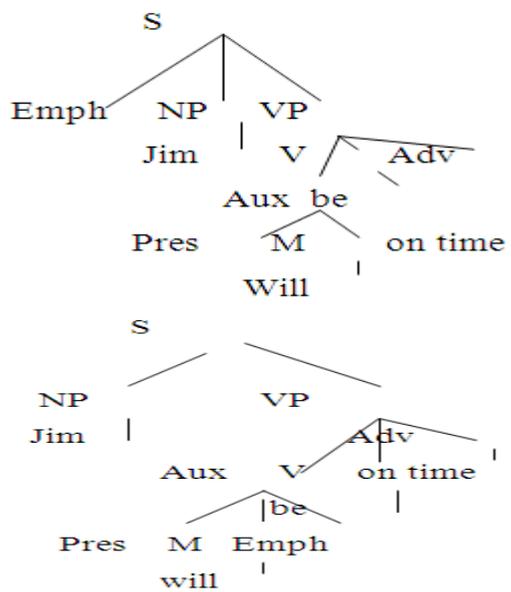
The phrase structure rule reads:
Emph + Jim + Pres + will + be on time $\Longrightarrow$ Jim + Pres + will +
Emph+ be on time X
X

When an auxiliary verb is not present and 'be' is the main verb, the Emph marker is placed after 'be', which receives heavy stress:

Emph + X+ t+ be + Y $\Longrightarrow$ X+ tense + be + Emph + Y
Emph+ Jim+ Pres+ be+ here $\Longrightarrow$ Jim + Pres+ be+ Emph + here

S
Emph   NP   VP
       Jim   Aux   V   Adv
             Pres be   here
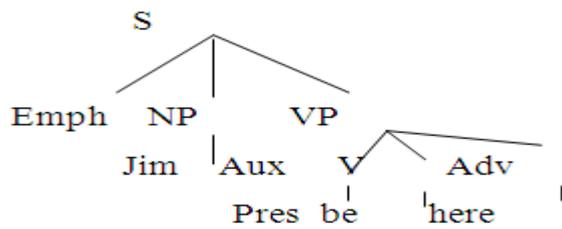
(23) Jim is here.

(Where Aux = 'Modal', or 'be', and 'have' dominated by Aux).

S
NP   VP
Jim   Aux   V Emph   Adv
           Pres be   here
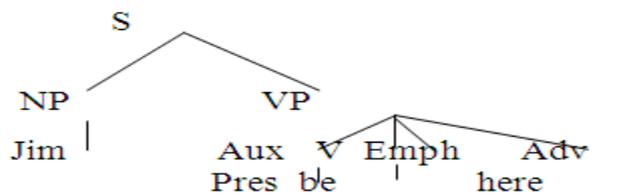
He (Ibid.:155) points out that for all other main verbs, the emphatic transformation places the Emph marker after tense:

S
Emph   VP
            Aux   V   NP
            Pas mail the   letter

S
NP   VP
N   Aux   V   NP
Ann   Pas Emph mail the letter
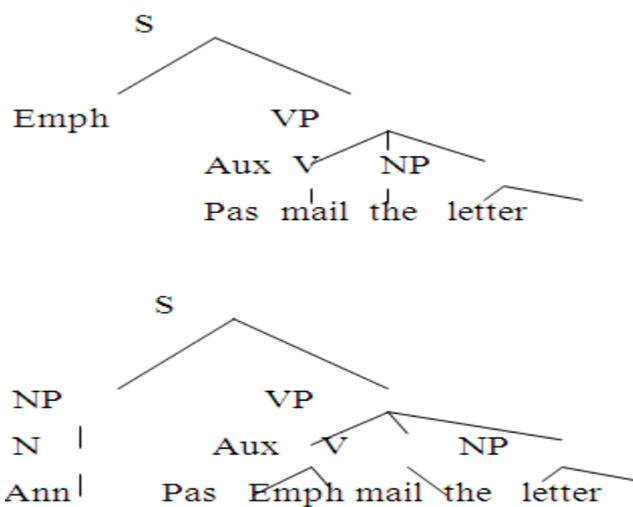
But another condition is stated since the Emph marker intervenes between tense and the verb as shown below:
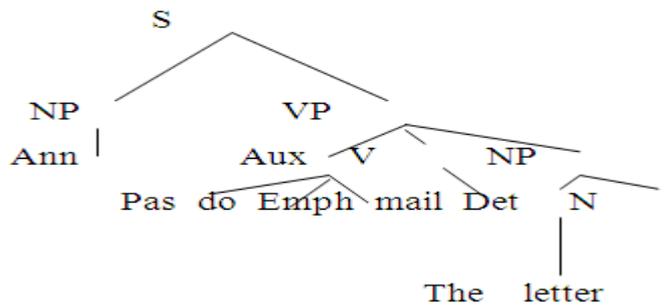
'Do' is inserted in the above diagram as a tense carrier. It receives heavy stress when it is introduced as such.

(24) Ann did mail the letter ('did' is emphatically stressed).
    did / did/

Lyons (1973, p.122) argues that in the analysis of sentences, the set of brackets within brackets will become increasingly difficult to read. Therefore, the tree diagram display is the most widely used convention to overcome this difficulty.

The following sentences are analysed in terms of tree diagrams depending on the PS- rules and the emphatic transformation provided by Bornstein (1977, pp.153-8). This analysis is also based on the standard theory. Consider the following affirmative construction:

(25) The mechanic will finish the job today.
    will / wi l /
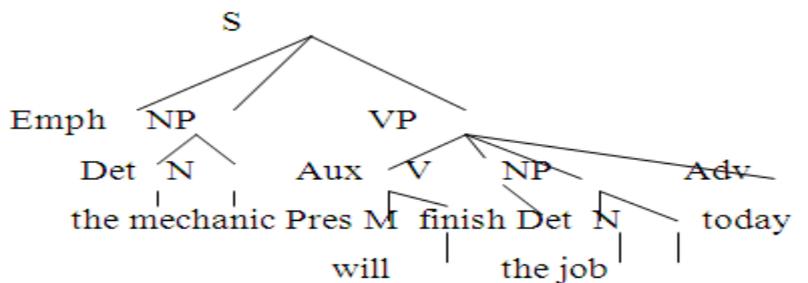
And the PS – rule states:
VP $\Longrightarrow$ Aux + V_T + NP
VP $\Longrightarrow$ Aux + V_I

The auxiliary is presented here as a separate constituent to be more effective in accounting for the emphatic transformation in English.

When an auxiliary verb is present, it receives heavy stress. The transformation is as follows:
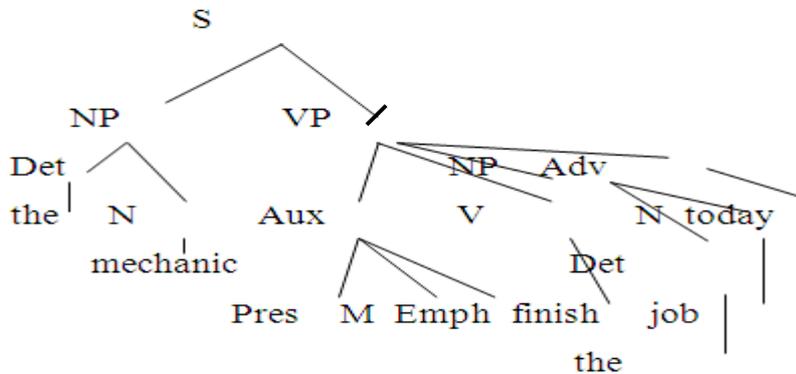
If the sentence is negative, the word that receives emphasis is 'not':

(26) Jim will not be on time.
The emphatic transformation first places 'Emph' after tense and the first auxiliary verb as shown in the following rule: (Bornstein ,1977, p.156).

Emph +Jim + Pres + will +be on time $\Longrightarrow$ Jim +Pres + will +
Emph + be on time
$\qquad$ X

The negative transformation then places 'not' after tense and the first auxiliary verb:

Neg+Jim+Pres+will+ Emph+be on time $\Longrightarrow$ Jim + Pres + will +
not + Emph+ be on time

Since 'not' is the word that precedes the Emph marker, it receives heavy stress.

This study is limited to a restricted set of negatives: those in which 'not' – the most usual form of the negative constituent – appears because Bornstein (1977, pp.153-8) deals only with this form of negative sentences.

The application of the negative transformation is clear in the following phrase structure rules and the tree diagrams are illustrated below:

Emph + Bill + Pres +will + pass the test $\Longrightarrow$ Bill + Pres + will +
$\qquad$ X

Emph + Pass the test.   (Bornstein, 1977:157)
$\qquad$ X

The negative transformation is as follows:

Neg + Bill + Pres + will + Emph + pass the test ⟹ (Neg)

Bill + Pres + will + not + Emph + pass the test
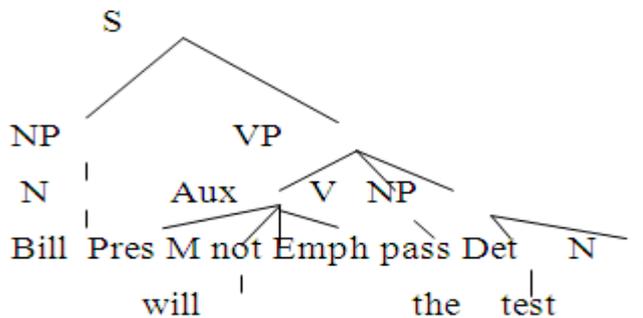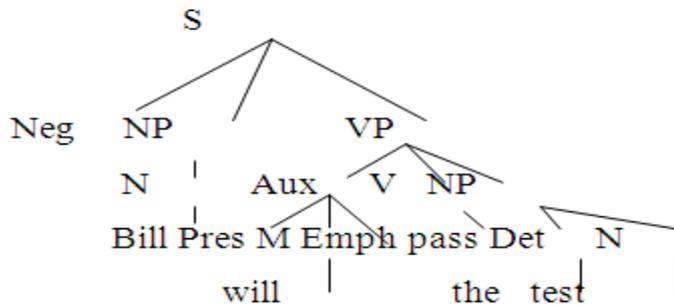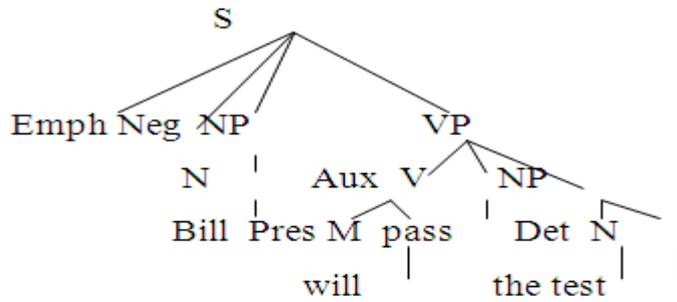
To see how the rule works with more complicated verb phrases, consider the following sentences:

(27) Barbara may not be coming to the party.

(28) Ron is not returning to school this term.

It is clear that regardless of how many verbs appear under the auxiliary, 'not' always follows the first auxiliary verb.
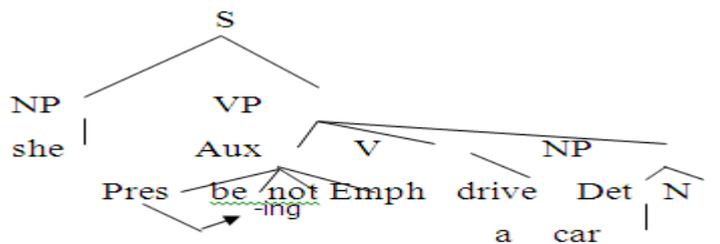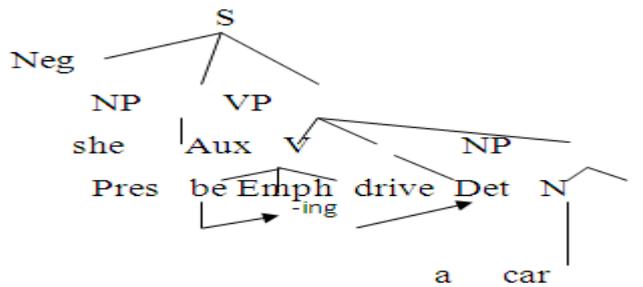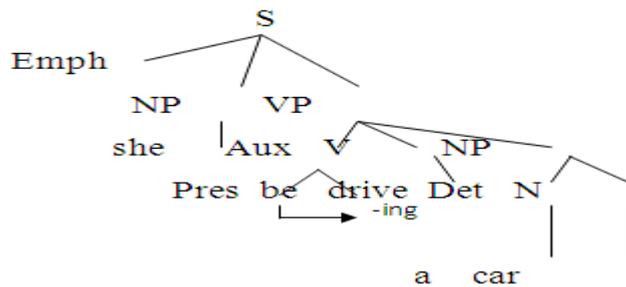
Now consider the following sentence:

(29) She is not driving a car.

Emph+ she + Pres + be + driving a car ⟹ she + Pres + be +
Emph + driving a car   X
                X

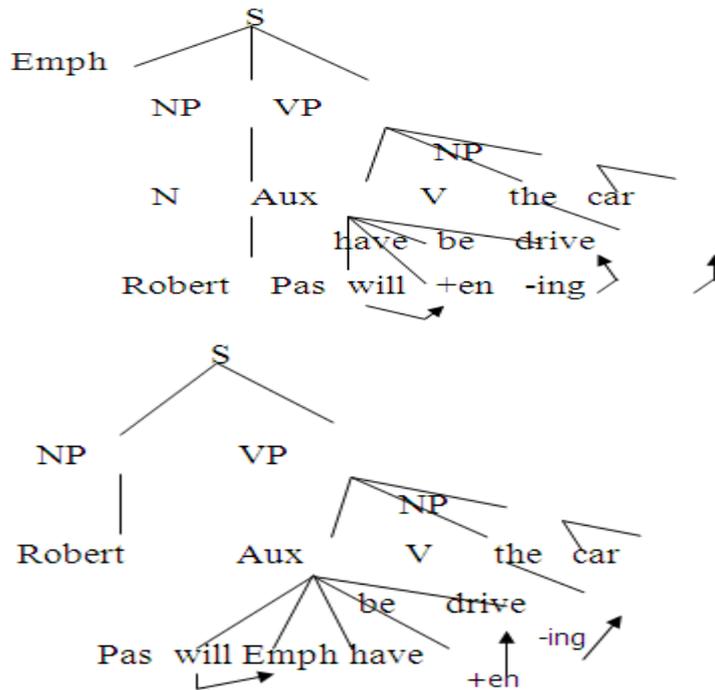The negative transformation with the emphatic stress read:

Neg+ she+Pres +be+ Emph+driving a car ⟹ she + Pres + be +
not+ Emph+ driving a car   (Ibid.)

To examine the following sentence with the full expansion of the auxiliary and emphatics:

(30) Robert would have been driving the car.
would /w u d/ (strong form)

The transformation can be diagramed as follows:

From the above tree diagrams, the affix rule is applied three times: 'past' attaches to 'will', '-en' attaches to 'be' , and – 'ing' attaches to 'drive', 'have' is left in uninflected form. The Emph marker is placed after tense and the first auxiliary verb. This indicates that the choices of more than one optional auxiliary element will not affect the application of this emphatics.

However, if the auxiliary and 'not' are contracted into one word, the entire contraction receives emphasis:
 (31) Jim will not be at time.
 (32) Jim won't be at time (contraction transformation).

In these sentences, if 'not' is present, it is heavily stressed, but if 'not' is contracted, then the word it contracts with is stressed.

The complete rule for the emphatic transformation can be stated as follows:

$$\text{Emph} + X + \text{tense} + \begin{bmatrix} \text{Aux} \\ \text{be} \end{bmatrix} + Y \Longrightarrow X + \text{tense} + \begin{bmatrix} \text{Aux} \\ \text{be} \end{bmatrix} + \text{Emph} + Y$$

Generally, negative emphatic sentences show heavy stress on 'not' and the emphatic marker generated somewhere in pre - sentence position:
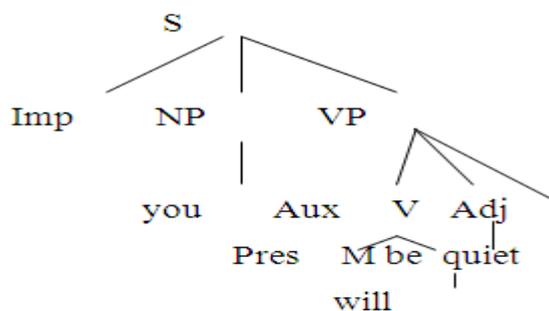
S ⟶ … Emph … NP VP

A transformation must be formulated to place Emph marker in the correct position (inside) auxiliary (Akmajian and Heny, 1975, p.227) .

The imperative transformation involves deletion of the subject pronoun 'you', present tense, and a modal. It can be stated formally and diagramed as follows:
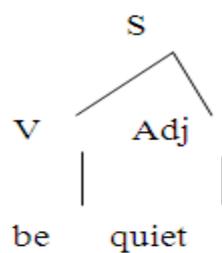
(33) Be quiet!
Imp +you +Pres + will +be quiet $\Longrightarrow$ be quiet
                          X

(Deep structure)

(Surface structure)

The Imp marker is needed to distinguish the deep structure of a command from a sentence that is simply a prediction:
 (34) You will be quiet (because you will be afraid to make
                          noise)
In the case of negative or emphatic imperatives, 'do' is appeared in the surface structure as follows:

(35) Do be quiet!
(36) Do not litter!
     do / d u:/ (strong form)

The rule states that the negative and emphatic transformation place 'not' and 'Emph' respectively after tense and the first auxiliary verb. The negative and emphatic elements are left stranded when these items are deleted by imperative transformation:

Imp+ you + Pres + will + Emph + be reasonable $\Longrightarrow$ Emph + be reasonable

Imp+ you + Pres + will + not + litter $\Longrightarrow$ not litter

 (Bornstein ,1977, p.161)

In these cases, 'do' is introduced to support 'not' or the Emph marker. Therefore, an additional rule is needed. The rule states that if an auxiliary verb or a main verb does not precede 'not' or the Emph marker, the sentence meets the (SD) for the do transformation, and 'do' is placed before these elements to support them. The following tree diagram shows how the rule works with sample examples:

Emph + be reasonable $\Longrightarrow$ do + Emph + be reasonable (obligatory)
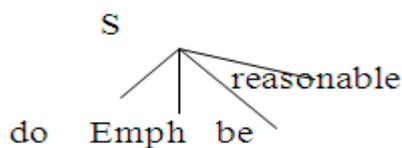
What is important here is that this rule accounts for the appearance of 'do' in imperative, but not in positive commands or in those with normal stress (Ibid.).
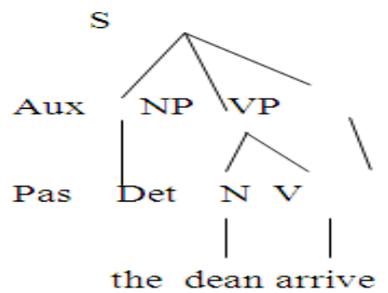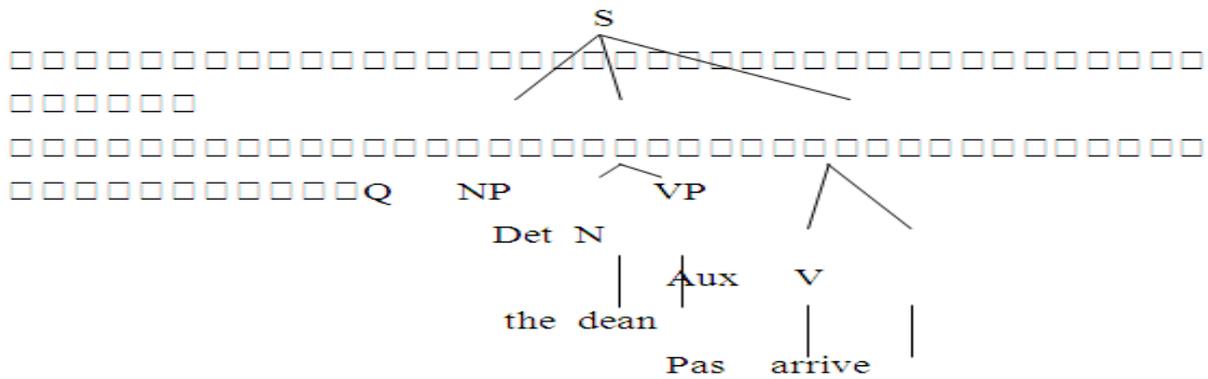
(37) Stop that noise!

(38) Do stop that noise!

(39) Be reasonable!

(40) Do be reasonable!

Moreover, consider the following tree diagrams:

S

Q NP VP

Det N

the dean Aux V

Pas arrive

S

Aux NP VP

Pas Det N V

the dean arrive

Q+ NP +tense +X $\Longrightarrow$ tense +NP + X

Q +the dean + Pas +arrive $\Longrightarrow$ Pas +the dean + arrive

As tense is not followed by a verb, the conditions exist for the obligatory do transformation.
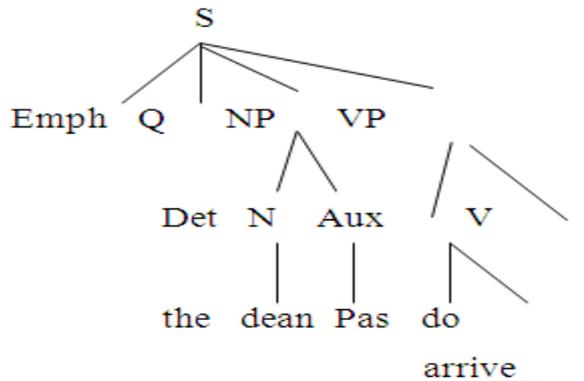
Pas + the dean +arrive $\Longrightarrow$ Pas + do +the dean + arrive (obligatory)

This PS- rule is shown as follows:

S

Aux NP VP

V

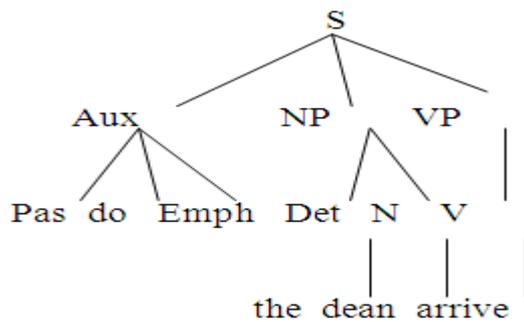Pas do Det N
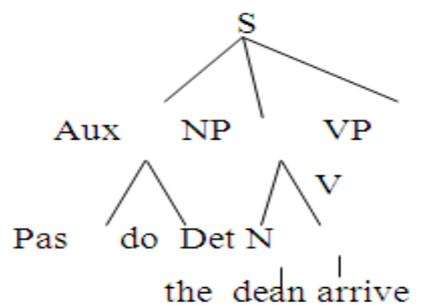
the dean arrive

In this case, the do transformation produces the following sentence:

(41) Did the dean arrive?

It seems that this example is an emphatic interrogative and the emphatic transformation is clear in the following tree diagram:

Then, the Emph marker is placed after tense and the first auxiliary verb as follows:

When the Wh question word is the subject of the sentence, the Wh transformation does not have the same effect of the yes / no question transformation. Therefore, tense precedes the verb, and the do transformation is not necessary, as shown in the following tree diagram:
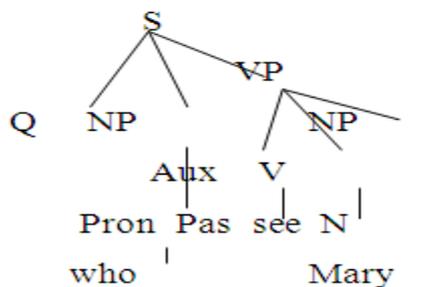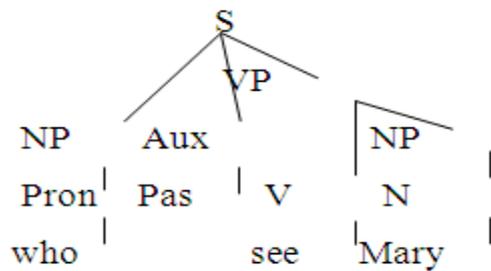

question transformation:

Q + who + Pas +see + Mary ⟹ Pas + who + see +Mary
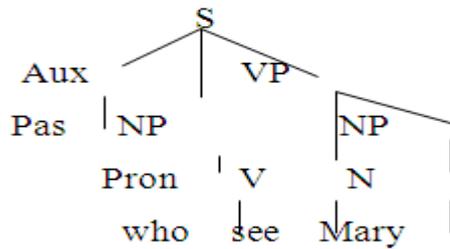
Wh transformation:

Pas + who + see + Mary ⟹ who + Pas + see + Mary
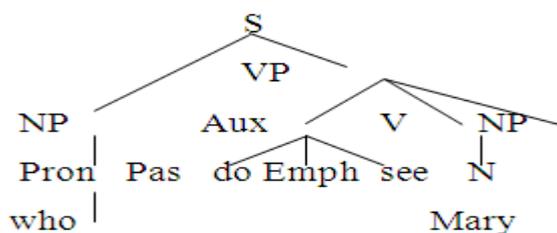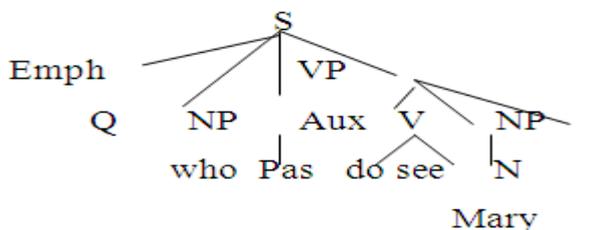(Bornstein , 1977, p.145)

(42) Who saw Mary?

The do transformation must follow the yes/no question transformation and the Wh transformation. Otherwise, it is possible to get sentences like the following:

(43) Who did see Mary ?
He (Ibid. :146) points out that the above sentence would be grammatical only if it were meant to be emphatic. Consider the following tree diagrams:

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In order to show how the negative, interrogative, imperative, and emphatic sentence modifiers affect the basic sentences , they appear in explaining their configuration in this PS– rule:

$$S \longrightarrow \begin{bmatrix} (Emph) \\ (Imp) \\ (Q) \end{bmatrix} (Neg)\ NP + VP$$

(Bornstein, 197, p.53)

The parentheses indicate that the markers are optional, and the double parentheses indicate that none, or one , or more than one of the items may be selected. Therefore, this PS – rule refers to the possibility of selecting these markers so as to generate different types of sentences (Ib

Conclusions

This study has investigated the interface between syntax and phonology in English sentence construction.

As far as the interface between syntax and phonology is concerned, the following points are noted:

1- The interaction between syntax and phonology is explored in terms of 'focus' in English sentences. As a kind of focus device, 'emphasis' on a certain significant part of a sentence can be conveyed by syntactic means: e.g. clefting and pseudo clefting, auxiliary verb do.

2- The 'Emph' option requires additional stress to be placed on the tense- plus- whatever auxiliary element immediately follows it, or tense- plus- the verb 'be', in order to produce emphatic sentences. The stress placement isolates the tense when some other verb follows it (tense). Additionally, the 'Do Insertion' Transformation makes it possible for the stress to be placed on tense- plus- do .

3- The phonological rules are dependent, to a large extent, upon syntactic information. This means that it is necessary to provide information concerning the syntactic category of a word, i.e., whether a word is a noun , a verb , a pronoun and so on.

4- The phonological rules also require information concerning the position of the word in the sentence in a particular context. This kind of information is syntactic rather

than phonological. For example, the particle movement transformation, the cleft transformation, and extraposition transformation.

Finally, the hypotheses of this study are confirmed. This reflects the fact that syntax is more powerful than phonology in English sentence construction, i.e., syntax dominates phonology.

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