The Affix-Hopping Rule: What, How and Why?

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0.Introduction

After the publication of Chomsky's Syntactic Structures (1957) and Aspects of the Theory of Syntax (1965), a new approach to the study of language came into prominence under the label "Transformational Generative Grammar (TGG). Such a grammar comprises "a set of rules and principles which specify how to form, pronounce and interpret phrases and sentences in the language concerned (Radford, 1988:2)

Due to the emergence of this new theory in linguistics, several terms have been introduced and new concepts have been adopted by TG grammarians. One of these terms is "Affix[(1)]-Hopping Rule"[(2)] .This rule of affix Movement "dates back to the very earliest work TG, in its earlier incarnation as Affix Hopping-e.g. Chomsky's Logical Structures (1955) and Syntactic Structures (1957)" (Ibid: 601).

The aim of this paper is to briefly discuss the concept of the Affix- Hopping in English in terms of its meaning and its application within the framework of TGG showing with

examples how and why it operates on various types of English sentences be they in the active or passive voice.

1. Phrase Structure Grammar

TGG in its early version assumes that sentences are structured not only out of words belonging to various word level categories, but also out of phrases belonging to the corresponding set of phrasal categories (Ibid:63)

This grammar is divided into two parts (a) Phrase structure (Ps) rules and (b) a lexicon. In constructing a derivation which shows the grammatical relationships of a sentence, we first start with the (Ps) rule which runs as follows: **S⟶ NP + VP.** Then we opt for the rules in any order, rewriting each element on the right of the arrow till arriving at the element which cannot be rewritten again. Next, we turn to the lexicon substituting lexical items for the symbols used. The output will give the actual representation of the structure of a grammatical sentence in English (Thomas and Kintgen, 1974, 34). This simplified model of grammar was expanded to include another type of rule called transformational (t) rules which are of two types: optional and obligatory ones[3] (Ibid:38).

Let's start with the (PS) rules which look like the following:

Rule (1) S ⟶ NP + VP

Rule (2) NP ⟶ (Det) N

Rule (3) VP ⟶ Aux + MV

Rule (1) states that a sentence (S) in English consists of (or is re-written as) a noun phrase (NP) and a verb phrase (VP). The same procedure can be used to express the relationship among the (NP) which is rewritten as determiner plus a noun and the (VP) which consists of auxiliary plus a main verb). Given this, the initial (S) shows that this grammar is in fact a grammar of sentence and both the (NP) and the (VP) must be present in a sentence.

A cursory look at Rule (3) indicates that the Aux is an obligatory constituent of the (VP). It is found in the deep structure of every (VP) whether the main verb is of type be as in (1&2) or any other lexical verb (as in 3&4,) shown below

1- He is a teacher.
2- She was happy.
3- They went out.
4- We study French.

2.The Aux

It has been assumed that, English is notorious for having a very complex verbal system. (Palmer, 1971: 167) Concerning the status of Aux, one can notice that it has been treated differently by different grammarians. (see Akmajian, etal. 1979:1) However, what concerns us here is how the aux is tackled within the framework of TGG.

According to Fowler, the aux is the first and foremost a system of syntactic meaning rather than a set of classifiable morphes (1977:67). This category is not a symbol for a class of lexical items, nor does it introduce dictionary meaning; rather it is a deictic formative whose role is "to locate a proposition in relation to the whole scheme of different contexts in which one might use it" (Ibid: 36).

Going back in our analysis, the basic (PS) rule for rewriting the consistent Aux runs as follows:

Rule (4) Aux ⟶ tense (M) (have + en) (be + ing)

Aux ⟶ tense

Tense ⟶ { present / past }

Aux ⟶ tense (be + ing)
Aux ⟶ tense (have + en)
Aux ⟶ tense (M) (have + en) (be + ing)

(Liles, 1971: 19-22)

Examples are:
5. He sings a song.
6. He song a song.
7. He is / was singing a song .
8. He has / had sung a song.
9. He has / had been singing asong.
10. He will / would have been singing a song.

This means that (a) every Aux contains a tense marker (morpheme) which is an obligatory first element shown up in all

sentences. It is either present (non-past) or past (b) it may contain one or two optional elements and (c) it may contain three optional elements which have a strict word order: an optional modal, followed by an optional occurrence of the progressive have, followed by an optional occurrence of the progressive be Reversing the linear order of these elements will result in ungrammatical sentences-a case which accounts for the grammaticality of the sentence (11.a) and the ungrammaticality of sentence (11.b)

11.a - He will have been teaching English
11.b * He is having taught English

It should be noted that the reason why tense precedes all other optional elements is that it must invariably be attached to whatever is opted for first; However if none is opted for, it must be attached to the main (lexical) verbs. (Jacobsen, 1977:99). As a corollary, rule (4) gives us a total of eight permissible Aux configurations.

a.Tns. M have en be ing
b.Tns. M have en
c.Tns. M be ing
d.Tns. M
e.Tns. have en be ing
f.Tns. have en
g.Tns. be ing
h.Tns. V. (Baker,1978:76)

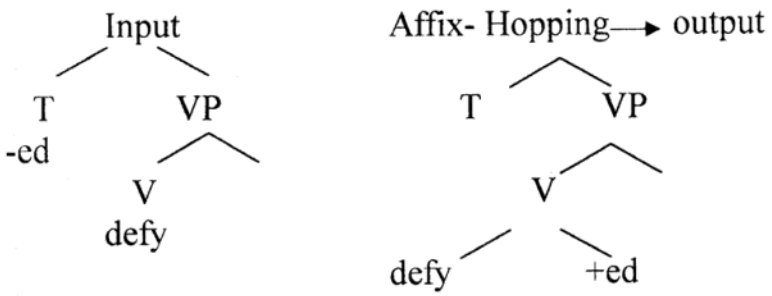
3. Affix - Hopping Movement

What is required next is to associate each of the elements (or bound morphemes) Tns, en and ing (represented byAf.) with the affected verbal element whether a modal, have, be or a verb represented by V.[4] Thus, an obligatory transformation movement known as Affix-Hopping is to applied to generate the positive declarative sentences. It is represented as AF + V → V + AF (Thomas and Kintgen, 1974:59). In this connection, we quote the following:

> Every sentence requires at least one
> T-rule:T. AFFIX- HOPPING, which hops
> suffixs round to the end of the verbs
> to which they are eventually attached
>
> (Aitchison, 1978:121)

> in affirmative....sentences, the tense
> suffix attaches to the main verb
> ([use + past] → [used]). This is
> achieved by the syntactic
> process of affix –Hopping which
> shifts the tense suffix down onto
> the verbal stem
>
> (Fromkin,2000:112)

This can be depicted in the following tree-diagram.



(Ibid)

It is worth mentioning that Affix-Hopping is one example of inflection movement which is the smallest form of movement which takes place at the morphological level .Such a type of movement is inflectional since "inflectional processes take a morphological (inflectional) affix and inflect it onto a (lexical) item(Galassos,2002:2). The rationale behind applying it is to "restrict the correct forms of verbs to correct contexts" (Tomori, 1977: 71) where the affix and the verb must be adjacent to each other (Crain & Martin- Lillo 1999,86).

The Affix-Hopping rule applies to various types of sentences such as affirmatives ,negatives and interrogatives. Let's discuss the application of this rule each of these types.

3.1 In Affirmative Sentences:

To indicate how this rule operates on affirmative sentences, we can say that it is a process in which an affix hops (or jumps) to the right of the immediately following verb, thus becoming part of it. In other words, it rearranges certain symbols that are independent constituents in the deep structure but that end in the surface structure as bound morphemes (Edmondson & Plank, 1976:111) The Affix.- Hopping rule takes the following formulation:

Affix – Hopping (obligatory)

$$X - \begin{Bmatrix} Tns \\ en \\ ing \end{Bmatrix} \quad \text{———} \quad \begin{Bmatrix} M \\ have \\ be \\ v \end{Bmatrix} - Y$$

1	2	3	4
1	Ø	3+2	4

(Huddleston,1976:74)

This means that

1)the rule applies to auxiliary verbs (M, have, be) as well as main verbs.

2)the rule moves the affix to the right of term 3 thus "transferring the tense/ Agreement properties of an empty finite onto the left most [sic] v. of Vp.[5] (Radford, 1988:589)

3)the symbol Ø (zero) shows that the position occupied by term 2 in the input phrase marker is empty in the output.

4)this transformational operation is one of "Chomsky-adjunction[6] which runs as follows: Chomsky-adjion 2 to the right of 3. delete the original 2" (Jacobsen,1997:273).

5) the rule must apply once to all affixes concerned. Otherwise all the affixes would end up on the main verb, thus producing undersiable strings.e.g.^{X}decidesing,^{X}walkeding.

6)the rule is last-cyclic i.e. it ranks last in terms of application[7]. (Ibid:274).

Applying this rule to the terminal string in (a), we can obtain the following sentences in (b) after the application of morphophonemic rules.

A	B
Past go	go past (= went)
Pres be ing eat	be pres eat ing = (is eating)
Past have en teach	have past teach en (= had taught)
Pres have en be ing buy	have pres be en buy ing =(has been buying)
Past may go	may past (=might go)
past can be ing run	can past be run ing (= could be running).

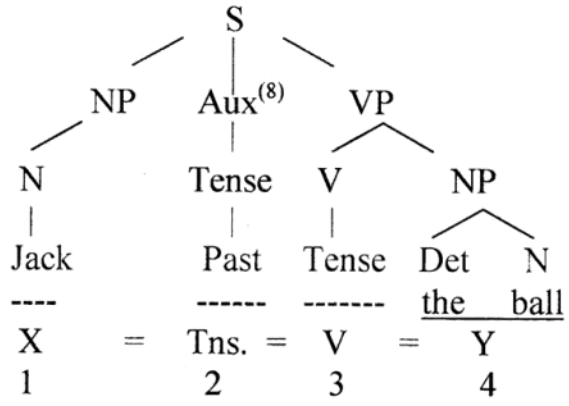
The string in (a) is not accepted as a well-formed surface structure but it is only an intermediate stage in the derivation (Huddleston, 1976:175). In other words, If Affix –Hopping is

not applied in cases in which a structure description is met, the result will be ill-formed sequences.

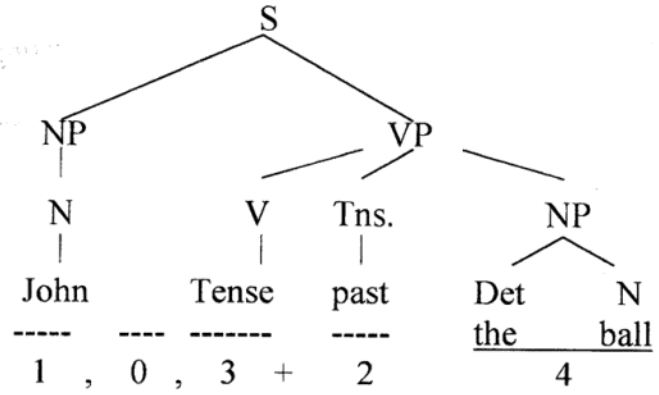
* John past will you have en ing talk the baby.

(Baker,1978:81)

To illustrate how to hop past to the verbs consider the following tree diagram



Applying Affix-Hopping rule, we get the following tree diagram



(Ibid:77)

Like active sentences, the passive ones undergo the application of Affix-Hopping; in such a case the Affix-Hopping rule applies after passivization as shown in the following string:

a) Zeki pres will have en meet Layla (by Ps rule)

b) Layla pres will have en be en meet by Zeki (by passivzation)

c) Layla pres will have en be meet en by Zeki (by Affix-Hopping)

d)Layla pres will have be en meet en by Zeki (by Affix-Hopping)

e) Layla will pres have be en meet en by Zeki (by Affix-Hopping)

(12) Layla will have been met by Zeki

The transformational rules are ordered as such because "the ultimate position of the inflectional affixes cannot be specified until the voice of the sentences has been determined" (Huddleston,1976:74). In other words, "the obligatory T.rules must operate AFTER the optional T. rule such as passive transformation (Palmer, 1971:169).

2- In negative sentences:

Negative sentences are usually formed from positive declaretive ones by inserting the negative particle not dominated by Aux. However, if none of these elements exist, not is preceded by the appropriate form of Do support. Examples are:

(13) a. He is clever

b. He is not clever

(14) a. He smokes a lot

(14) b. He does not smoke

Inorder to clarify the order of transformations (including Affix-Hopping) involved in negative sentences, consider the following :

a. Zeki past be ing meet Layla (by Ps rules)
b. Zeki past be not ing meet Layla (by Not placement)
c. Zeki be past not ing meet Layla (by Affix-Hopping)
d. Zeki be past not meet ing Layla (by Affix-Hopping)

(15) Zeki was not meeting Layla.

Note that Not placement is applied before Affix-Hopping; otherwise, the application of this rule is blocked. (Huddleston, 1976:80).

As for negatives, which contain a tensed verb like (meet) the negative particle which intervenes between the affix-hopping (past) and the verb (meet) makes the Affix-Hopping inapplicable to this structure, if such a condition exists, then Do as "the bearer of an unaffixed affix" is inserted (Tomori,1977:75)

Zeki past meet Layla (by ps rules)
Zeki past not meet Layla (by Not placement)
Zeki do past not meet Layla (by Do support)

16. Zeki did not meet Layla

From the above-cited examples, can see that Not placement is ordered before affix-hopping, and in case of the passive voice, passivization is to be ordered before Affix-Hopping (See Huddleston, 1976:79-80).

3. In Interrogative Sentences

In English questions are usually classified into two types: yes-no questions and wh-questions. They are usually formed from declarative ones by reversing the order of the subject (Np) and the first auxiliary verb.

However, to illustrate the application of Affix-Hopping to interrogative sentences when they contain one of the constituents of the aux (for example have + en), consider the following example:

a. Zeki pres. have en go (by Ps rules)
b.Pres. have Zeki en go (by inversion)
c.Pres. have Zeki go en (by Affix-Hopping)

(17) Has he gone?

This shows that inversion is applied before Affix-Hopping.

As for interrogatives which contain a tensed verb. Affix-Hopping cannot apply directly, a case which involves the insertion of Do as a tense carrier as seen in the following example:

a. Zeki	past meet	Layla	(by Ps rules)
b. Past Zeki	meet	Layla	(by inversion)
c. Do	past Zeki	meet Layla	(Do support)
(17)Did	Zeki meet	Layla?	

One should note that inversion is ordered before Affix-Hopping so as to prevent past being moved round meet and the like and inversion is ordered before Do support in order to create the situation which involves the insertion of Do (Ibid: 78-79).

In this respect, Crain & Martin- Lillo write:

> Do- support is only used as a last resort operation. It applies to save a stranded tense affix in questions and in a few other situations. Always apply all other transformations first. If the tense affix ends up next to the verb, then apply Affix-Hopping. (1999:176)

As for interrogative passive sentences, four transformations should apply in the order (a.) passivization (b.) inversion (c.) Affix-Hopping and (d.) Do support.

a. Zeki past meet Layla (by Ps rules)
b. Layla past be en meet by Zeki (by Passivization)
c. Past be Layla en meet by Zeki (by Inversion)
d. be past Layla en meet by Zeki (by Affix-Hopping)
e. be past Layla meet en by Zeki (by Affix-Hopping)
(18) Was Layla met by Zeki ?

4. Conclusion

From the previous discussion of the Affix-Hopping rule in English, the researcher has come up with the following findings:

1) Affix- Hopping is an obligatory morpho-syntactic transformational rule adopted by TG grammarians. It must be used in the generation of almost every English sentence. i,e, it is required in every sentence which contains a tense marker in the VP. Without applying this rule, ill-formed sentences result.

2) In contrast to Ps rules which cannot rearrange (or flip – flop) any element in a derivational string; Affix Hopping can accomplish such an arrangement by reversing the order of the affix and the verb in such a way that the Affix becomes attached to its suitable place at the end of the verb. It can be represented as

$$Af + V \Longrightarrow V + Af$$

In other words, it applies to such notions a present, past, as well as ing be have, etc. in the formulation of rules.

3) Affix-Hopping can be performed no more than once for any single derivation .Otherwise, pile-up of inflexions will result.

4) Affix-Hopping should be applied to the deep structure of affirmative, negative and interrogative sentences, whether they are active or passive. This obligatory rule usually

operates after the application of optional t.rules but before morphophonemic rules.

However in interrogatives and negatives, which require more than one t-rule and when the application of Affix-Hopping first is blocked, transformations should be applied in a specified order as shown below:

a) in some interrogative sentences:

Inversion ___ Affix-Hopping___ Do support.

b) in some negative sentences:

Not placement___ Affix-Hopping___ Do support.

As for sentences which undergo passivization, the Affix-Hopping rule runs as follows

Passivization___ Affix-Hopping.

In view of the above-cited conclusions, it is recommended that students who major in English and take a course in TGG should be directed towards this (t) rule and it should be incorporated in their textbooks since some TGG textbook's do not offer a thorough description of this operation while others such as Lilie's (1977) does not even tackle it at all-a reason which accounts for conducting this study.

Notes:

(1) The term "affix" is in fact a makeshift device: affix is not a category determined by any Ps rule (Jacobsen, 1977:273).

(2) Alternative terms are Flip-Flop transformation (Thomas, 1965:60), Affix Incorporation transformation (Thomas & kintgen, 1974:172). Affix-shifting transformation (Fowler, 1977:17) the rule of Affix-movement (Radford 1988:402) Affix Hopping Transformation (wardhaugh 1995:11).

(3) Optional rules of transformation refer to those rules which are applied to kernel sentences, thereby producing passives, negatives, interrogatives, etc. Obligatory rules, on the other hand, are meant for the morphological operation of different types e.g. rules for the number and agreement between subjects and the verb, rules concerning tense forms of verbs. (Thakur,1998:170).

(4) The fact that M, have, be, & V have a similar behaviour regarding this rule shows that they really share a significant syntactic property-that which distinguishes it from other elements like nouns adjectives etc. (Huddleston,1976:214).

(5) Number agreement is only shown on the first element of the VP aside from which element it is

a. The boy runs.

b. The boys run.

c. The boy is running.

d. The boys are running.

e. The boy has run.

f. The boys have run.

(6) A structural change of a sentence can be made via some elementary transformational operations: deletion, substitution and adjunction. Adjunction is of two types: sister-Adjunction and Chomsky-Adjunction (see Huddleston, 1976:189) .

(7) Consider the following pair of sentences:

a. John expected Peter to come.

b. (John expected it (Peter T come))

S_1 S_2 S_2 S_1

a- sentence is derived from (b) sentence by applying two rules: subject-to-object and to –replace-Aux where the latter should be applied before the former i-e, the one which applies at the end is called last-cyclic.

(See Jacobsen,1997:274)

(8) For some grammarians aux is subsumed under the S (Chomsky, 1957,Baker, 1978) , while for others it is subumed under the VP. (Liles, 1971).

REFERENCES

Akmajian-A. Steele S. and Wasow. T(1979): "The category Aux in Universal Grammar" Linguistic Inquiry. 10.PP 1-64.

Aitchison, J. (1978): Linguistics .New York David Mckay & Co.Inc

Baker, C.L. (1978): Introduction to Generative Transformational Syntax. New Jersey: Prentice-Hall Inc.

Brown E.K. & Miller J.E. (1980): Syntax: A Linguistic Introduction to Sentence Structure. London: Hutchinson & Co Publishers Ltd.

Chomsky, N (1957): Syntactic Structures The Hague: Mouton & Co. Publishers

_____, (1965): Aspects of the Theory of syntax. Cambridge: Massachusetts: The M.L.T. press.

Crain,S & Martin-Lillo T (1999): An Introduction to Linguistic Theory and Language Acquisition Oxford: Blackwell Publishers Ltd.

Edmondson,J.&Plank,A.F.(1976) "Auxiliaries and Main Verbs Reconsidered" Lingua, Vol. 38.No.2 pp109-125.

Fowler, R (1977): An Introduction to Transformational

Syntax London : Routledge and Kegan Paul

Fromkin, V.A. (2000): Linguistic Oxford: Blackwell publishers

Galasso,J(2002): Analyzing English Grammar :An Introduction to Feature Theory in HTTP WWW CSUN GALASSO.

Huddleston, R. (1976): An Introduction to English Transformational Syntax Longman Group Ltd. New York.

Jacobsen,B.(1977): Transformational Generative Grammar Amsterdam:North-Holland Publishing Company.

Liles, (1971): An Introductory Transformational Grammar. New Jersey: Prentice-Hall, Inc.

Palmer, F. (1971): Grammar Harmondsworth penguin Books Ltd.

Radford, A. (1988): Transformational Grammar: A First Course. Cambridge: CUP.

Thakur,D. (1998): Linguistics simplified: Syntax. PATNA Bhawan publishers & Distributors.

Thomas.O. (1965): Transformational Grammar and the Teacher of English. New York: Holt, Rinehart and Winston, Inc.

_____, and Kintgen E.R. (1974): Transformational

Grammar and the Teacher of English New York Holt, Rinehart and Winston Inc.

Tomori, O (1977): The Morphology and Syntax of Present-Day English. London: Heinemann Educational Books & Ltd.

Wardhaugh , R (1977): Introduction to Linguistics New York: McGraw-Hill Book.

_____,(1995): Understanding English Grammar. Oxford: Blackwell