

The Role of Movement Transformation in Recursiveness: Evidence from English and Standard Yorùbá

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Abstract

Human beings are naturally endowed with innate ability with which they make use of finite number of grammatical constituents to generate infinite number of acceptable and grammatical sentences, through a linguistic process known as *recursion*. What is really marvelous about recursion is the fact that, in addition to its pervasiveness among natural languages, the resultant amazing sentences produced through the process are always rule-governed. Such derived sentences can be subjected to grammaticality judgement by any native speaker of the language in which the sentences are produced; no matter how long the sentences might be. The aim of this paper is to present empirical data from English and Standard Yorùbá¹ (two languages that are genetically unrelated)² for the purpose of illustrating how the syntactic creativity of recursiveness produces new meanings and nuances of meanings through the application of a movement transformation like ‘relativization’ to a given basic sentence. The Principles and Parameters (P&P) theory is employed as a theoretical framework for our analysis in this paper.

Keywords: Recursion, Movement transformation, Relativization, English, Standard Yorùbá

1. Introduction

Following (Chomsky 1957, 1965), linguists are of the view that linguistic processes are in some sense ‘creative’ and that languages possess a technical device for expressing a linguistic system known as recursion. Thus, Chomsky theorizes that unlimited extension of a language such as English is possible only by the recursive device of embedding sentences in sentences. In other words, recursion in linguistics enables ‘discrete infinity’ by embedding phrases within phrases of the same type in a hierarchical structure.

Mitchell and Myles (2004: 63) gave the examples in (1) below to illustrate the concept of recursion, by embedding phrases within phrases:

- She bought a new car yesterday. (1)
- My friend bought a new car yesterday.
- The friend that I met in Australia last year bought a new car yesterday.
- The friend I am closest to and who was so supportive when I lost my job two years ago bought a new car yesterday.

As shown in (1) above, Mitchell & Myles remarked that the constituents: *she*, *my friend*, *the friend that I met in Australia last year* and *the friend I am closest to and who was so supportive when I lost my job two years ago* are the same kind of groupings and perform the same role in the sentence, and in fact might refer to one single individual.

Considering the linguistic importance of recursion, Crystal (2006: 389) makes the following assertion:

The importance of *recursion* (or *recursiveness*) is that recursive rules are the main FORMAL means of accounting for the CREATIVITY OF LANGUAGE: by using this device, an infinite set of sentences can be generated from a finite set of rules. A simple illustration of how this can be formalized is in the following rules:

NP → Det + N (+ Prep Phrase)

Prep Phrase → Prep + NP

These rules say, in effect, that there is in principle no limit to the number of PREPOSITIONAL PHRASES which may occur following a noun in a noun phrase, e.g. *the man in a coat with a collar...*

Trask (1993: 229-230) also illustrates the concept of recursion with the following English example:

I'm reading a book about the reasons for the development of computers with the capacity for high-speed manipulation of virtual objects under the control of users with no previous experience of....

According to him, recursion is the principal reason that the number of sentences in a natural language is normally taken to be **infinite**.

Through the process of recursion, a sentence of any size or shape can be fashioned out in any natural language. For example, consider the *length* of the following grammatical sentence that was used as the opening sentence of Daniel Defoe's *The Life and Shape and Surprising Adventures of Robinson Crusoe* (1719), as quoted in King (2004:26):

I was born in the year 1632, in the city of York, of a good family, though not of that country, my father being a foreigner of Bremen, who settled first at Hull: he got a good estate by merchandise, and leaving off his trade, lived afterward at York, from whence he married my mother, whose relations were named Robinson, a very good family in that country, and from whom I was called Robinson Kreutznoer; but, by the usual corruption of words in England, we are now called, nay, we call ourselves, and write our name Crusoe, and so my companions always call me.

It sounds incredible that the above quotation consists of a single grammatical sentence. It provides an evidence to show that native speakers of a language are naturally endowed with the power of '*recursion*' to generate long sentences within the permissible rules of the grammar. However, Bach (1974: 26) remarked that it would be "empirically absurd" to think that there could be an acceptable English sentence that would be a million words long. In other words, the process can continue ad infinitum, but we may run the risk of getting exhausted as a result of human limitations or bring our listeners to tears!

The innate ability of the native speaker of a given language has given him/her the power to carry out some syntactic re-ordering of the various grammatical constituents that make up a sentence in that language; without violating the rules of the grammar. Thus, it could be said that *Syntax* plays a significant role in the process of recursion in a given language.

1.1 Defining Syntax

While tracing the historical origin of 'syntax', Wrenn (1949: 130) revealed that, "Historically, however, syntax should mean 'the ordering or arranging of words' (from Greek *syn* 'together' and *taxis* 'arranging')." In an attempt to define syntax, Stockwell (1977:1) gave the following explanation:

To study syntax is to study various aspects of how sentences are formed and how they are understood (i.e., interpreted semantically) in particular languages and in language generally. No language allows sentences to be formed by stringing words together randomly. There are observable regularities. Such regularities may be stated as rules.

Carnie (2006: 129) defines syntax from the perspective of psycholinguistics. According to him:

Syntax is the study of the mental representation of sentence structure, and since we all have the same basic gray matter in our brains, it would be nice if our theory accounted for both the similarities and the differences among languages.

According to Hall (2005: 330), "Syntax is the (study of) speakers' subconscious knowledge of how words are combined to make phrases and sentences".

1.2 Theoretical Framework

The theoretical framework employed as the methodological tool for our analysis in this paper is the theory of Universal Grammar (UG) known as Principles and Parameters theory. It is a modification of an earlier version known as Government and Binding (GB) theory.

Contrary to the notion of 'transformation' under the **TG**. Model, all cases of grammatical transformations like focus construction, relativization, question formation, passivization, extraposition, negation, etc. are now being

handled by a single transformation known as ‘Move Alpha’ (Move- α), with the appropriate parameter setting for a given language.

1.2.1 Features of the Movement Theory

Within the Principles and Parameters theory, the following are identified as peculiar syntactic features of the movement theory:

- Movement involves moving an element or constituent from one point (the extraction site) to another point (the landing site).
- Appearance of an empty category or ‘trace’ in an argument position.
- Appearance of a co-indexed or co-referential argument (i.e. an antecedent) often in a c-commanding position.
- The ‘trace’ or semantic gap must be properly governed by a governor, which can be a lexical or non-lexical category.
- The landing site of the moved element or constituent must be controlled by either *substitution* or by *adjunction*.
- Substitution will always move a maximal projection (i.e. top phrasal category) to the specifier position.
- Adjunction moves an element to a non-argument position.
- There can be no movement to complement position.
- Only a lexical head (X^0) and a maximal projection (XP) are visible for ‘Move- α ’.
etc.

2.0 Movement Transformation and Recursiveness

More than any other level of linguistics, syntax enhances the creativity of expression in natural languages. To support this claim, McGregor (2009:105) makes the following observation:

Syntax provides additional means of ‘opening’ the grammatical system for the expression of new meanings, nuances of meanings, precision in meaning and links between ideas; it provides means for speakers, to go beyond the limitations of the morphology and lexicon.... In this respect the difference between syntax and the other domains is one of degree rather than kind.

Recursiveness in syntax is achieved when movement transformation (alias Move- α) is applied to a basic sentence to generate different grammatical sentences with different meanings and nuances of meanings. According to Carnie (2006: 128), “Syntacticians aren’t interested only in English. One of the most interesting parts of syntax is comparing the sentence structure of different languages”. It was on this note that we have decided to examine the phenomenon of recursiveness in both English and Standard Yorùbá, through the process of ‘relativization’ as a movement transformation. The derivational processes involved in both English and Standard Yorùbá are discussed in (3.0) and (4.0) respectively.

3.0 Defining a Relative Clause

Following Stockwell, et al. (1973: 241), a relative clause in English language can be defined as follows:

A sentence embedded (in surface structure) as modifier of an NP, the embedded sentence having within it a WH-pronominal replacement for a deep structure NP which is in some sense identical with the head NP, is a relative clause.

Given the above definition of a relative clause, it could be said that a relative clause consists of two parts: the main clause and the embedded clause. According to Stockwell (1977:59), there are two types of relative clause in English: ‘Restrictive Relative Clause’ and ‘Appositive (Non-restrictive) Relative Clause’.

Type One: Restrictive Relative Clause (2)

- [The book]_i *that* I read [t_i] last night is interesting.
Rel.
- I saw the man *who* killed the goat.

- Rel.
- The man *who* won the prize is our uncle.
- Rel.
- [The pen]_i *that* John gave [t_i] to Mary is on the table.
- Rel.
- This is the boy *who* brought the book.
- Rel.
- etc.

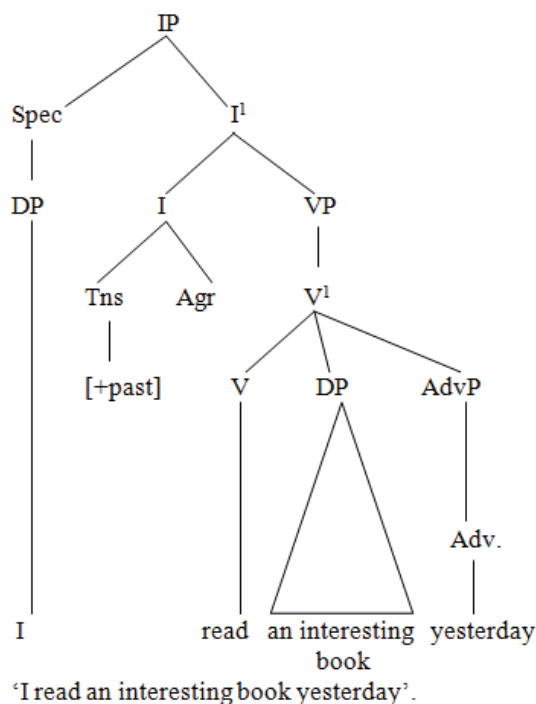
Type Two: *Appositive (Non-Restrictive) Relative Clause* (3)

- [The book]_i, *that* I read [t_i] yesterday, is quite interesting.
- Rel.
- Mr. John, the Principal of the school, was made the Chairman.
- James, the Class Monitor, stole the money.
- The pen, *which* I put on the table, is missing.
- Rel.
- The teacher, *whose* books were kept on the table, went for a meeting.
- Rel.

3.1 Relative Clause Construction as a Movement Transformation

As shown in the given examples in (2) and (3) above, different types of NP's/DP's have undergone movement for the purpose of relativization; thereby producing different grammatical sentences with different meanings and nuances of meanings through the process of recursion.

For example, in (2) and (3) above, the Noun Phrase – 'the book', which is the direct object of the verb-**read** moved from its original position (i.e., the extraction site) to its relativized position (i.e., the landing site) through a movement transformation known as 'relativization'. The derivational processes can be shown as phrase-marked in (figures 1 & 2) below:



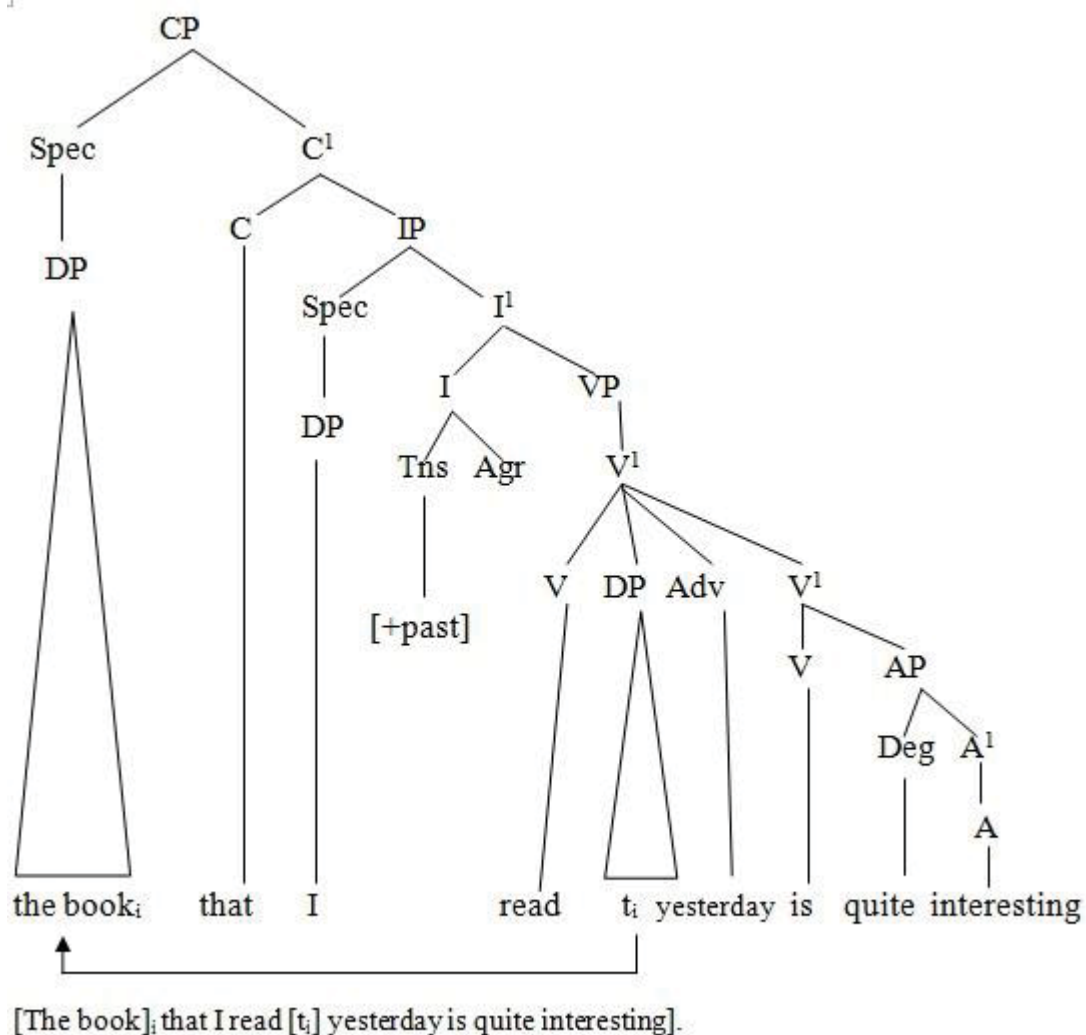


Figure 2. S-Structure

4. Relativization and Recursiveness in Standard Yorùbá

In Standard Yorùbá, all categories of DP can be relativized. However, in terms of accessibility hierarchy, the subject DP's are much more accessible than any other nominal category. Given the basic sentence in (4) below, all the DP's and the nominalized verb in the sentence can be relativized as shown in (5) below:

- Adé ra ìwé fún Bola. (4)
Adé buy book for Bola
'Ade bought (a) book for Bola.'

- *Subject-DP Relativization* (5)
Adé_i tí ó_i ra ìwé fún Bola lo sí Èkó.
Adé Rel. Agr-s buy book for Bola go to Lagos
'Adé that bought (a) book for Bola went to Lagos.'
- *Object of Verb-DP Relativization*
Ìwé_i tí Adé rà [_{ti}] fún Bola wà ní ilé.
book Rel. Adé buy for Bola be at house
'The book that Adé bought for Bola is at home.'
- *Object of Preposition – DP Relativization*
Bola_i tí Adé ra ìwé fún [_{ti}] se ìgbéyàwó.
Bola Rel. Adé buy book for do act of marriage
'Bola that Adé bought (a) book for got married'.

- *Nominalized Verb (i.e. Verbal Noun) – DP Relativization*

Rírà_i tí Ade ra_i ìwé fún Bola dún mó mi
act of buying Rel. Ade buy book for Bola sweet with me
‘The act of buying (a) book for Bola that Ade embarked upon pleased my mind’.

For the purpose of visual impression, some of the cases of DP movement, as exemplified with the Yorùbá sentences in (5) above, can be phrase-marked as in (figures 3-5) below:

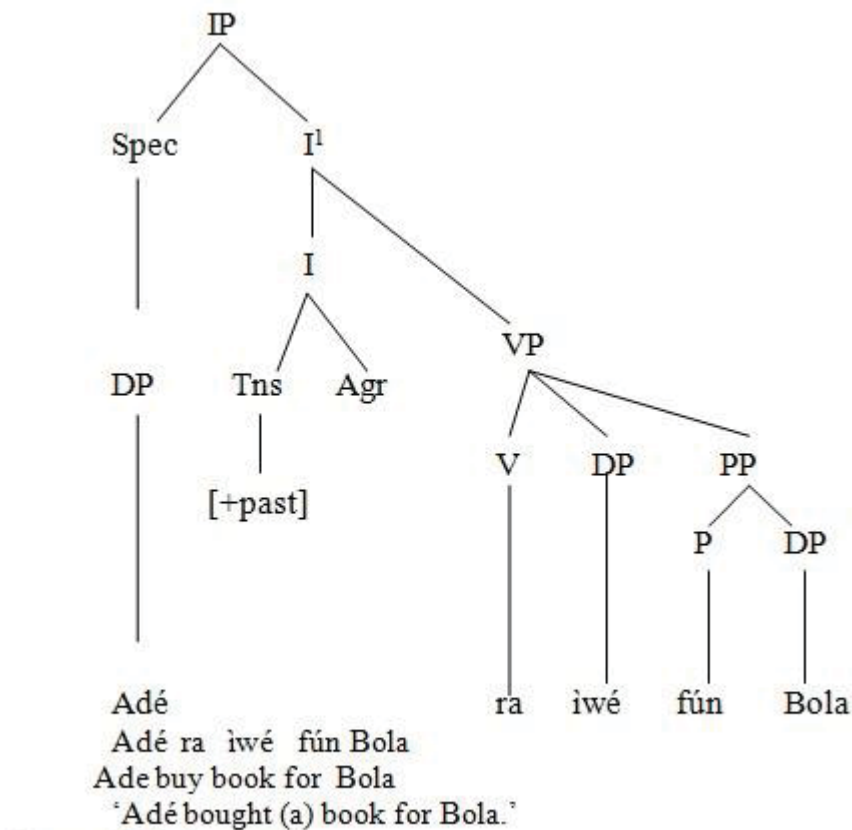
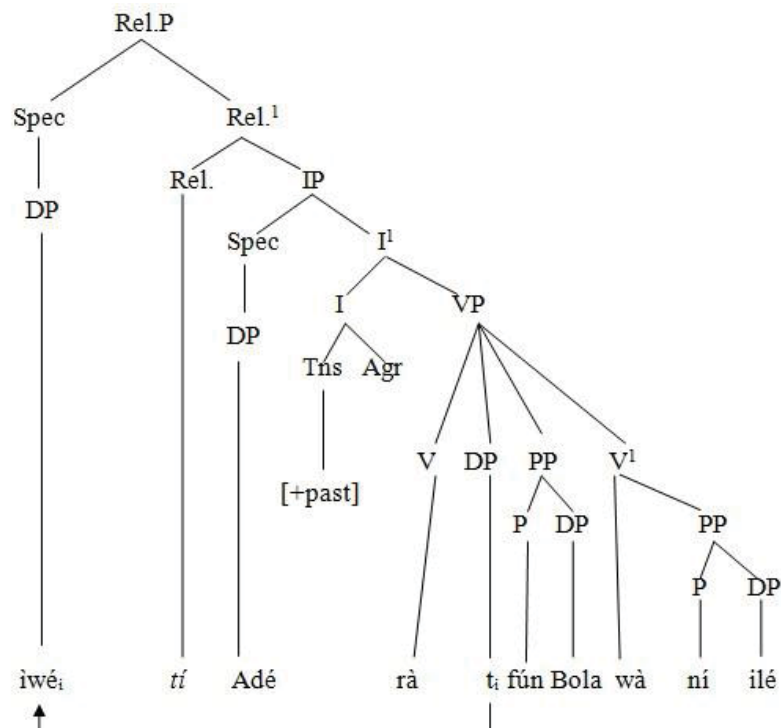
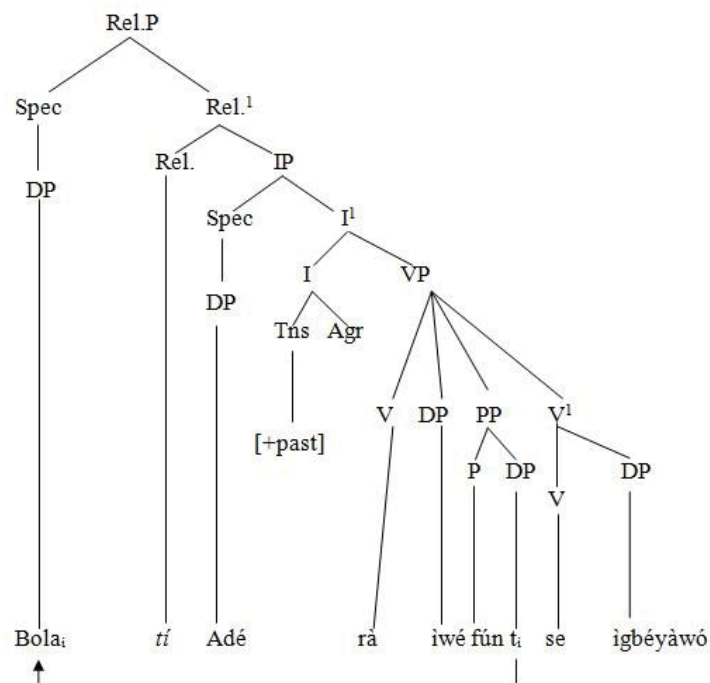


Figure 3. D-Structure



Ìwé tí Adé rà [tᵢ] fún Bola wà ní ile.
book that Ade buy for Bola be at house
'The book that Ade bought for Bola is at home'.

Figure 4. Object of Verb-DP Relativization



Bola tí Adé rà iwé fún [tᵢ] se igbéyàwó.
Bola Rel. Ade buy book for to do act of marriage.
'Bola that Ade bought (a) book for got married'.

Figure 5. Object of Preposition-DP Relativization

4.1 Syntactic Transformation and Recursiveness

As evident in the set of data presented in (2), (3) and (5) above, all the cases of DP movement resulting from the syntactic process of relative clause constructions in English and Standard Yorùbá exhibited the phenomenon of *recursiveness* in the two languages. For example, from the different categories of DP that were relativized from the given basic sentence in (4) above, different but related grammatical sentences, with different meanings and nuances of meanings, were derived (see 5) above.

5.0 Conclusion

Having defined the concept of ‘recursiveness’, with specific reference to syntax, we have shown in this paper that human beings are naturally endowed with the linguistic ability to use finite number of grammatical constituents to generate infinite number of acceptable utterances or sentences in a given language.

The paper has also provided empirical linguistic data from both English and Standard Yorùbá (two languages that are genetically unrelated) to show how ‘relativization’ can be applied to a given basic sentence to generate different grammatical sentences with different meanings and nuances of meanings.

What we have done in this paper is to provide empirical response to (Chomsky’s 1965) professional call that linguists should attempt “an explicit formulation of the “creative” processes of language”. It is our assumption that the movement transformation discussed in this paper constitutes one of such creative processes among natural languages.

Notes

1. As rightly defined by Mosadomi (2005:231), ‘Standard Yoruba’ refers to the North-Western Yorùbá. It is this variant of the language that has been chosen to be the *norm* because of its uniformity and wide use in schools, textbooks, and the media. Yorùbá is a tone language with *three* discrete tone levels:
High [']
Mid [unmarked]
Low [ˋ]
2. While English is an Indo-European language, Yorùbá belongs to **Kwa** – a sub-group of Niger-Congo Phylum.

Abbreviations

AgrS	=	Subject-Agreement Marker (i.e. resumptive or recapitulatory pronoun).
Rel.P	=	Relative Phrase
Rel.	=	Relative Marker

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