

A Remark on Linearization

Muhammed Salim

Ph.D. Research Scholar, Department of Linguistics
Aligarh Muslim University Aligarh, India
alsalim2014@gmail.com

Bedoor Sharaf Al Deen

Ph.D. Research Scholar, Department of Linguistics
Aligarh Muslim University Aligarh, India
Bedoorsaleh9@gmail.com

Mohammed Masoud

Ph.D. Research Scholar, Department of English
Aligarh Muslim University Aligarh, India
mkhmsoud2016@gmail.com

Abstract

This paper investigates linearization on or after a spell out. It argues that there is no correspondence between the PF component and the linearized syntactic domain after spell out. Following Kayne's (1994) Linear Correspondence Axiom and building on Fox and Pesetsky's (2005) Order Preservation, it shows that the T is interpreted in D₂ while it has to be affixed in D₁ at PF component. The study proposes that there has to be a mechanism at the interfaces that fuses the dispersed syntactic projections to correspond to the phonological component. The paper adopts Phase theory (Chomsky, 2000, 2001; Citko, 2011).

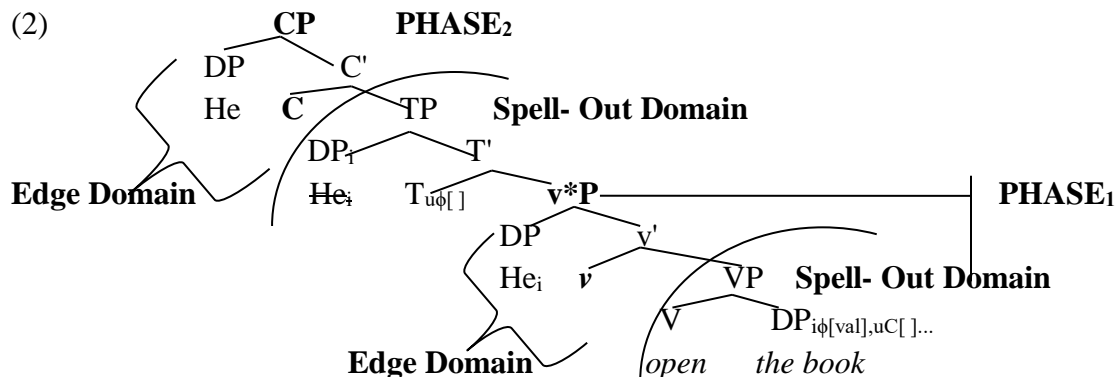
Keywords: spell-out, Phase theory, linearization, Interfaces

1. Introduction

Spell Out is a process by which part of the structure is sent to PF and the other part to LF. Two types of spell out can be distinguished: single and multiple. Single spell out indicates that the syntactic derivation is sent to interfaces only once after all projections have taken place. Single spell out has been the orthodoxy in GB theory (Chomsky, 1998) and Minimalism (Chomsky, 1995, 2000). Multiple spell out, on the other hand, comes to existence with the introduction of Phase Impenetrability Condition (PIC) as the syntactic derivation contains different phases and hence different parts of the structure are to be sent to interfaces at different times (Chomsky, 2001, 2008). Multiple Spell out indicates the occurrence of "spell out more than once per derivation" (Citko, 2011, p.42). The edge domain and the spell out domain are

spelled out at different times. To exemplify multiple spell out, have a look at the sentence in (1) and its syntactic representation in (2).

(1) He opened the books



The representation in (2) shows two phases, and each one has its own spell-out domain. The first phase is the light vP, and its spell domain is the VP. The higher phase is the CP, and its spell out domain is the TP. There are two versions of PIC. The versions of PIC are given in (3) and (4).

(3) The strong PIC₁

In phase α with head H, the domain of H is not accessible to operations outside α ; only H and its edge are accessible to such operations.

(Chomsky, 2000, p. 108)

(4) The weak PIC₂

The domain of H is not accessible to operations at ZP; only H and its edge are accessible to such operations.

(Chomsky, 2001, p. 14)

The PIC₁ shows that the complement VP spells out as soon as the T head of TP is merged. If VP spells out, it becomes no longer accessible for narrow syntax operations. On the other hand, there is a transfer delay in PIC₂. The VP complement waits until the head C of the higher phase is merged. Then the VP spells out. This entails that the search space for TP spans the vP and the VP. Having discussed the mechanism of spell out in phase theory, the next section explores what happens after spell out.

2. Literature Review

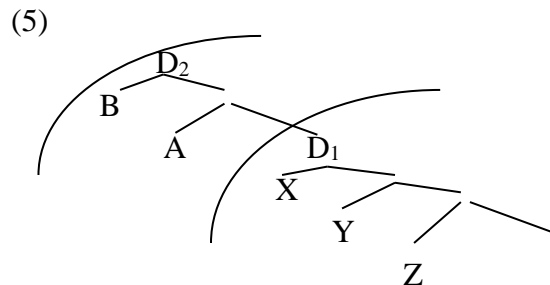
In section one, the mechanism of PIC of phase theory has been substantiated. This section attempts to characterize what happens after the spell out. Literature shows that independent

mechanisms have been suggested to characterize interfaces, i.e., linearization at PF and recombination at LF. The prevailing view regarding the A-P interface is that the shipped out syntactic elements are linearized at PF, i.e., the flattening of syntactic elements in linear order. Chomsky (2008) claims that linearization happens after spell out (p. 6). He argues that '[Linear] order does not enter into the generation of the C-I interface, and that syntactic determinants of [linear] order fall within the phonological component' and 'when a phase is transferred to ϕ , it is converted to PHON' (Chomsky, 2008, p.107). Following Kayne's (1994) Linear Correspondence Axiom, Fox and Pesetsky (2005) rightly argue for a slightly different opinion from that of Chomsky. They state that Linearization takes place at spell-out. In other words, it is Spell-Out that linearizes the transferred domains. Based on Fox and Pesetsky (2005), it can be assumed that every time Spell-out applies to a complement domain, that domain gets linearized, and so on. This has been called Order Preservation.

Each time the derivation constructs a Spell-out domain D, Spell-out applies, linearizing D. The first time this happens, Spell-out takes D as input and yields straightforwardly a linearization of D. Each time a new Spell-out domain D' is constructed, Spell-out linearizes the new material in D' and adds information about its linearization to the information cumulatively produced by previous applications of Spell-out.

(Fox and Pesetsky, 2005, p. 5)

To reproduce the linearized spell out domains, consider the syntactic representation in (5).



In (5), the first Spell out domain (D₁) may represent the spell out of a phase (phase complement), and the second spell out domain (D₂) may represent the phase edge. If another spell out domain is syntactically derived, it will be linearized in the same way as D₁ and D₂ do in (6).

(6) a. linear order preservation in D₁: X > Y, Y > Z

b. linear order preservation in D₂: B > A, A > D₁

(cf. Citko, 2011, pp.185-187)

Upon closer look at the representation in (5) and the ordering in (6), it appears that the linear order may not match the PF of the original sentence. This may be called dispersed syntactic projections at PF. Dispersed projection is the case in which syntactic categories, whether they are

lexical or functional, are projected independently in syntactic derivation but phonologically realized as one totality. To make it clearer, the tense is projected in head T of TP as phasal complement of CP. Let us assume that the T is projected in D₂. The verb is projected in V head of VP as phasal complement of the phase vP. However, the tense marker should be affixed to verb at PF. The question here is that how the tense is affixed to the verb bearing in mind the tense and the verb are linearized in independent and separate domains. To substantiate, consider the example in (1) repeated in (7a) and the subsequent discussion.

(7)a. He opened the books.

b. [CP [NP He] [TPuφ, iT]] [vPv[VP V open [DP [D the] [N books]]]]

Based on Chomsky's (2001) notion of phase, which centers on cyclic spell out and if Linearization is taken for granted, the sentence in (7a) will have the two domains D₁ and D₂ given in (8a) and (8b) respectively.

(8) a. D₁: [vP [VP open]] > [DP[D the]], [DP[D the]] > [N books]]

b. D₂: [CP [NP He] > [TPuφ, iT]], [TPuφ, iT]] > D₁

Notice that domains in (8) show that the tense and the verb are projected in different phasal domains. The tense 'past' is projected in a tense phrase (TP), which is the spell out domain of the CP phase in D₂. However, the verb 'open' is projected in VP, which is the spell out domain of the vP phase in D₁. So, tense and verb are syntactically projected and linearized in different nodes but in phonology, the past tense marker /d/ is brought to the verb /əʊpən/ giving rise to /əʊpənd/. In other words, linearization in our case means the tense appears before the verb and this linear ordering is preserved (see Fox and Pesetsky, 2005 for additional idea). If order of (7) is preserved, we would have a phonological structure that looks like the one given in (9a). The representation in (7b) is repeated as (9b) for easy comprehension of mapping failure.

(9) a. PF: /hi:/, /d*/, /əʊpən/, /ðə/, /bʊks/.

b. [CP [NP He] [TPuφ, iT]] [vPv[VP V open [DP [D the] [N books]]]].

The asterisk shows the point where the mapping between syntax and phonology may fail. This shows that the correspondence between phonological form and syntactic form would fail if linearization is used and preserved. So, the question that poses itself is how the phonological form /d/, which represents the past tense, is brought from a pre-verbal linearized position and suffixed to the verb?

3. The Proposal

In the above section, it was noticed that linearizing the tense and the verb at separate domains is an issue for the PF component. To overcome this issue, we argue that there is some kind of mechanism that syntagmatically fuses the dispersed projections at the PF component. This mechanism is responsible, for example, for the accumulation of the phonetic forms that ought to correspond to the syntactic form. The mechanism is also contingent (e.g., rules), i.e., elements happen due to the occurrence of others. A similar question has been raised by Irurtzun (2009) in his review of the architecture of grammar. That is, how do we get the phonological form that corresponds to the syntactic representation? He further states that ‘How do we get the phonological representations that corresponds to the syntactic representations? Jackendoff’s system⁽¹⁾ does not offer an answer’ (Irurtzun, 2009, p.155). Back to the question that has been raised in section two, it seems that there is some kind of fusion (F) between the tense in D₂ and the verb in D₁. The structure in (9b) is repeated in (10) for remembrance, and the fusion mechanism is illustrated in (11).

(10) [CP [NP He] [TP_{Uφ}, iT]] [VP V [VP V open [DP [D the] [N books]]]].

b. PF: D₂/hi:/, /d*/, D₁/əʊpən/, /ðə/, /bʊks/.

(11) Fusion: /hi:/, /d/, /əʊpənd/, /ðə/, /bʊks/.

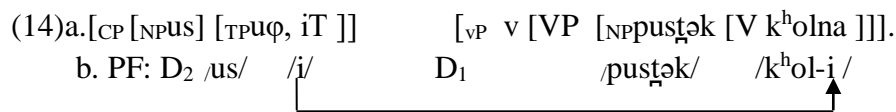
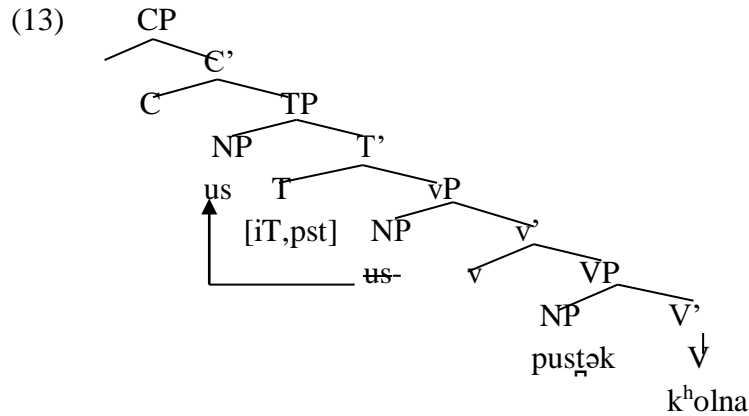


The representation in (10) shows that T is interpretable (Citko, 2014), but if LCA is followed, the T will be interpreted in D₂, which is not the desired place for interpretation. That is, interpreting the T in D₂ results in a correspondence failure between the phonological component and the syntactic component. Notice that the past tense marker /d/ is syntactically projected in D₂ while in fact it must be affixed to the verb in D₁ at the PF component. In phasal- theoretic concepts, the tense T and the 3rd singular marker are projected in [TP] as spell-out domain of CP. That is, they are in the higher phase.

On the other hand, the verb is projected in the lower phase i.e. vP phase. Hence the verb and the tense are in different phases and any linear ordering of spell out elements will make them apart from each other. To overcome issue at hand, it seems that there is a fusion (F+) node that affixes the /d/ phonetic form in D₂ with the verb /əʊpən/ in D₁, which subsequently give rise to /əʊpənd/ as represented in (11). Having said so, let us have a look at data taken from Hindi.

(12) us- ne puʃtək-φk^hol-i
 3sm-Erg book-m- Abs.open-pst.3sm
 ‘He opened the book.’

The sentence in (12) has the syntactic representation given in (13), and the spell out domains can be given in (14). Adopting Larson's (1988) VP – shell analysis, I assume that the subject 'us' originates as an outer specifier of the light vP projection, and the object 'pustāk' originates as an inner specifier of VP. This analysis correctly specifies the word order in (12)



The representation in (14) shows that the verb is base generated as V of VP and is spelled out and linearized as in D₁, and the tense is linearized in D₂. The tense in D₂ ought to fuse with the verb in D₁ to result in /k^hol-i/ at PF component. Fusion as such is an interface mechanism that draws information from the syntax and phonological components and possibly other interface modules. The section to come summarizes the discussion.

4. Summary

In lieu of a conclusion, the discussion that has been taken up so far, revealingly, draws certain lines of enquiry to the necessity of correspondence between the syntactic component and the phonological component at interfaces. Following Fox and Pesetsky's (2005) Order preservation, the study shows that the past tense marker /d/ is linearized and preserved in D₂. However, it has to be affixed to the verb /əʊpən/ at the PF component in English. In Hindi, the past tense is also linearized in D₂, and it has to be fused with the verb in D₁ to give rise to /k^hol-i/ at the PF component. The study proposes that there have to be a mechanism that fuses /d/ in D₂ to /əʊpən/ in D₁ at the interfaces. This proposal may be considered an attempt to explore yet unexplored areas. We may hasten to say that the existence of a fusion mechanism is conceptually necessitated, hoping that this stipulation would be empirically supported and explored in future endeavors. That is, there has to be a comprehensive cross-linguistic study of fusion to identify the universalities of fusion that may be shared by the languages.

References

- Chomsky, N. (1988). *Lectures on government and binding: The Pisa lectures* (No. 9). Dordrecht: Foris Publications.
- Chomsky, N. (1995). *The Minimalist Program*. Cambridge, Ma: MIT Press.
- Chomsky, N. (2000). Minimalist inquiries: The framework. In R. Martin et al. (Eds.), *Step by Step. Essays on Minimalist Syntax in Honor of Howard Lasnik* (pp. 89–155). Cambridge, MA: The MIT Press.
- Chomsky, N. (2001). Derivation by phase. In M. Kenstowicz (Ed.), *Ken Hale: a life in the language* (pp. 1-52). Cambridge, MA: MIT Press.
- Chomsky, N. (2008). On phases. In C. Otero et al. (Eds.), *Foundational Issues in Linguistic Theory: Essays in Honor of Jean-Roger Vergnaud* (pp. 134–166). Cambridge MA: The MIT Press
- Citko, B. (2011). *Phase theory: An introduction*. Cambridge University Press.
- Fox, D. & Pesetsky, D. (2005). Cyclic linearization of syntactic structure. *Theoretical Linguistics* 31: 1–45.
- Gallego, Á. (2010). *Phase Theory*. Amsterdam and Philadelphia: John Benjamins.
- Jackendoff, R. (1997). *The Architecture of the Language Faculty*. Cambridge, Mass: MIT Press.
- Iruztun, A. (2009). Why Y: on the centrality of syntax in the architecture of grammar. *Catalan journal of linguistics* 8: 141-160.
- Kayne, R. S. (1994). *The Antisymmetry of Syntax*, MIT Press, Cambridge (Mass.)/London.
- Larson, R. (1988). On the double object construction. *Linguistic Enquiry* 19: 335- 391

End notes

- 1- Jackendoff: Jackendoff (1997) proposes the parallel architecture of grammar in replacement of the inverted Y- model of GB theory and Minimalism. This model suggests the parallel creation of derivations at syntax phonology and Conceptual modules and the establishment of correspondence rules between the modules.

Abbreviations

3	Third-person
*	error
ϕ	phonological component
Abs	Absolutive case
A-P	Articulatory- Perceptual
acc	accusative

C ⁰	Head of complementizer phrase
CP	complementizer phrase
D	Spell out Domain
D	Head of DP
DP	Determiner phrase
GB	Government and binding
m	Masculine
N	Head of noun phrase
nom	nominative
NP	Noun phrase
Nom	Nominative
pst	past
Erg	ergative
s	singular
T	Tense phrase head
TP	Tense phrase
v	Light verb
vP	Light verb phrase
V	verb
VP	Verb phrase