1. Introduction

In the earlier minimalist syntactic framework (Chomsky 1993, 1995), the syntactic computation from Numeration to LF is divided into two cycles by a certain timing of derivations, called Spell-Out, which ships derivations to the phonological cycle. In the overt cycle before Spell-Out, movement creates non-trivial chains, which consist of sets of copies of a lexical item under the copy theory of movement (Chomsky 1993) and only the highest/lefmost copy of the chain is assumed to be pronounced at PF. After Spell-Out, movement is covert in that it does not feed the phonological component, whether it is carried out in the form of feature movement or category displacement (Chomsky 1993, 1995). As a reflection of this overt/covert distinction, it has been assumed that movement in the overt cycle is always associated with deletion of lower copies and pronunciation of a highest/lefmost copy. This premise has sometimes been challenged at the course of the development of syntactic theory.

Groat and O’Neal (1996) denies the overt/covert distinction, unifying the two cycles into one and arguing that all types of movement occur in the single cycle. Overt movement should be construed as copying of phonological features into the checking domain, which is triggered by checking of a strong feature (see also Bobaljik 1995). Pesetsky (2000) defends the view that movement sometimes referred to as an operation in the covert cycle, for example, Quantifier Raising (QR), applies before Spell-Out and the phonological component chooses to pronounce the tail of a chain (see also Fox and Nissenbaum 1999). In this view, QR is covert phrasal movement in the sense of Pesetsky (2000) in that movement involves an entire category, not just formal features, and moved quantifiers are pronounced in their original position (i.e., in-situ).

This paper offers additional empirical evidence in support of the view that QR takes place in the overt cycle. The argument comes from a frozen scope phenomenon in predicate fronting, which is observed by Huang (1993), among others. The representative paradigm is presented in
The wide scope interpretation of the quantified object is lost once the VP undergoes predicate fronting.

In the first place, I would like to establish that moved predicate phrases constitute a scope island. In addition, I argue that the frozen scope in (1b) has no relation with the computation in the covert cycle. According to Heycock (1995) and Takano (1995), the fronted predicate phrase must be interpreted in its pre-moved position at LF. Given this, the configuration of (1b) in the covert cycle could roughly be the same as that of (1a) in which scope ambiguity is clearly available. These issues are taken up in the next section. The frozen scope in (1b) should arise from the illegitimacy of what happens in a cycle different from the covert one, that is, the phonological cycle. In section 3, I suggest that the phonological component cannot map onto a licit linear order a phrase marker in which the object quantifier can take scope over the subject quantifier. Since the chain created by QR in the overt cycle is destroyed by predicate fronting in this case, its linear order violates the defining property of a linear order, that is, the antisymmetry (Kayne 1994). The final section sums up the paper.

2. Frozen Scope and LF
2.1 Scope Freezing Puzzles

The aim of this section is to show that fronted predicate phrases constitute a scope island, which becomes an argument in favor of the covert phrasal QR in the subsequent section.

The frozen scope in predicate fronting is a familiar phenomenon and it has been argued in Reinhart (1983). The more recent discussion can be found in Huang (1993). Huang (1993) provides the following two sets of the facts. The example in (3) is the repetition of (1) for expository purposes.

(2) a. No one will teach every student. \( \neg \forall, \forall \neg \)
   b. [Teach every student]\(_1\), no one will t\(_1\). \( \neg \forall, \neg \forall \neg \) (Huang 1993:125)

(3) a. Someone saw everyone. \( \exists \forall, \forall \exists \)
   b. [See everyone]\(_1\), (I am sure) someone did t\(_1\). \( \exists \forall, \neg \forall \exists \) (Huang 1993:125)

In (2b) and (3b), the universally quantified objects cannot take scope over the subjects, while the
wide scope reading of the former is available in the non-fronted counterparts in (2a) and (3a). The phenomenon is not restricted to the scope relation between the quantifiers in the subject and the object positions. Once predicate fronting applies, the quantified object must be interpreted under the scope of the negation, as illustrated in (4).

(4) a. John doesn’t speak more than three languages.  \( \text{Neg} \gg \text{more}, \ \text{more} \gg \text{Neg} \)
b. [Speak more than three languages], John doesn’t t1.  \( \text{Neg} \gg \text{more}, *\text{more} \gg \text{Neg} \)

Two remarks must be in order here. First, one might think that the scope of the moved quantifier is fixed in its pre-moved position, irrespective of the types of movement. However, upon the following contrast between predicate fronting and argument fronting, this hypothesis turns out to be untenable.

(5) a. [Fond of some boy], every girl is t1.  \( *\exists \gg \forall, \ \forall \gg \exists \) (Reinhart 1983:189)
b. [Some boy], every girl is fond of t1.  \( \exists \gg \forall, \ \forall \gg \exists \) (Reinhart 1983:200)

The scope freezing effect in predicate fronting in (5a) is already familiar to us. Particularly illuminating is scope ambiguity in topicalization of the quantifier in (5b). It reveals that the moved quantifier sometimes takes wide scope. Consequently, it is secure to conclude that the frozen scope is a peculiarity of predicate fronting, but not movement in general.

Second, notice that the quantifier affected by predicate fronting can scopally interact with another quantifier in cases where the latter also resides inside the fronted predicate phrase. The point is illustrated in (6).

(6) a. John gave something to everyone.  \( \exists \gg \forall, \ \forall \gg \exists \)
b. [Give something to everyone], John did t1.  \( \exists \gg \forall, \ \forall \gg \exists \)

From the observations above, we can securely make the following descriptive generalization concerning the frozen scope in predicate fronting.

(7) Quantified expressions inside the fronted predicate phrase cannot move out of that phrase via QR.

This descriptive generalization receives additional empirical support in viewing from quite a different angle. I would like, here, to be concerned with antecedent-contained deletion (ACD), which is exemplified in (8).

(8) Dulles suspected everyone who Angleton did [VP e].  \( \text{May 1985:11} \)

distinction is irrelevant for the discussion.
Since Bouton (1970), the ACD construction has received considerable attention in the generative literature in that it violates the anti-c-command condition on VP-ellipsis (Kennedy 1997, Larson and May 1990, May 1985, among others). It poses an interesting question as to how an appropriate interpretation gets obtained with the elided VP being reconstructed. If the antecedent VP is copied into the elided VP in ACD, it yields another elided VP and the elided VP does not receive a proper interpretation at all, as shown in the representation after copying in (9). This is known as an infinite regress problem.

(9) Dulles suspected everyone who Angleton \([_{VP \text{ suspected everyone who Angleton did}}}_{VP \text{ e}}\)

For the resolution of the infinite regress in ACD, May (1985) appeals to QR that adjoins a quantificational expression to a position that dominates the antecedent VP, typically TP or VP, and this approach is convincingly defended by Kennedy (1997), among others. As illustrated in (10), the antecedent containment relation is eliminated from the structure after QR applies to the quantified expression.

(10) \([_{TP \text{ everyone who Angleton did}}}_{VP \text{ e}}\]$_{1}$ $[_{TP \text{ Dulles}}]_{[_{VP \text{ suspected } t_{1}}]}$

Consequently, the newly created antecedent VP in the form of \(suspected \ t\) is reconstructed into the elided VP, which delivers the desired interpretation.

Our concern here is related to the observation by Larson and May (1990). According to Larson and May (1990), the possibility of the VP reconstructed into the elided VP is ambiguous in the following multiply embedded context. In (11), the VP headed by \(visit\) and the one headed by \(want\) are the candidates for the antecedent VP.

(11) John wants to visit every city you do \([_{VP \text{ e}}]\). \hspace{1cm} \text{(Larson and May 1990:113)}

Adjunction of the quantifier to the embedded clause yields the former construal and that to the matrix clause, the latter reading. Combining the QR approach to ACD with the ambiguity of the copying sites in (11), the following paradigm of ACD would reinforce the descriptive generalization in (8).
(12) a. Polly wanted to begin to learn every language Eric did [VP e].
   [VP e] = want to begin to learn
   [VP e] = begin to learn
   [VP e] = learn

b. [Want to begin to learn every language Eric did [VP e]]1, Polly did t1.
   [VP e] = want to begin to learn
   [VP e] = begin to learn
   [VP e] = learn

c. [Begin to learn every language Eric did [VP e]]1, Polly wanted to t1.
   *[VP e] = want to begin to learn
   [VP e] = begin to learn
   [VP e] = learn

d. [Learn every language Eric did [VP e]]1, Polly wanted to begin to t1.
   *[VP e] = want to begin to learn
   *[VP e] = begin to learn
   [VP e] = learn

In (12a), the antecedent VP for the elided one is three-way ambiguous. In other words, the elided VP can be construed to be the VPs headed by want (matrix reading), by begin (intermediate reading) and by learn (embedded reading). The elided VP in (12b) in which the largest VP undergoes predicate fronting can be understood in the same way as the non-fronted ACD in (12a). The matrix reading is impossible in the case where the intermediate VP moves into the sentence-initial position, as illustrated in (12c). Finally, the only available interpretation for the elided VP is the embedded one when predicate fronting operates on the most embedded VP, as shown in (12d). Let us concentrate on (12d) for illustration. If the quantifier inside the fronted VP were to move out of the fronted phrase via QR and to attach to the matrix clause in (12d), the matrix reading could be available. This is clearly not the case, however. Thus, the set of ACDs in (12) reveals that the quantifier cannot undergo QR targeting the node outside the fronted predicate phrase.

To sum up, the asymmetry in the copying sites for the elided VP above could be subsumed under the generalization in (7). In the next section, I would like to suggest that the frozen scope in predicate fronting should not be caused by the computation in the covert cycle.

3 Argument fronting of the quantifier containing the elided VP exhibits three-way ambiguity in the ACD construction in (i).

(i) [Every language Eric did [VP e]]1, Polly wanted to begin to learn t1.
   [VP e] = want to begin to learn
   [VP e] = begin to learn
   [VP e] = learn
2.2 Argument vs. Predicate Asymmetry

It could be argued that the frozen scope in predicate fronting arises from the special character of its configuration in the covert cycle in which QR out of the fronted phrase is prohibited. This is the line that Huang (1993) adopts. Huang (1993) argues that the wide scope reading of the object involves lowering to the TP-adjoined position. This movement is prohibited since the variable remains unbound. The representation in (13) illustrates this point.4

(13) \[\text{Teach } t_1 \text{ [TP } \text{every student } \text{[TP } \text{no one will } t_1 ]]\]

This argument would be tenable if the configuration of predicate fronting is distinct from that of its non-fronted counterpart. Unfortunately, there is little evidence for this assumption. Huang’s (1993) observations are particularly illuminating in this regard. Huang (1993) shows that predicate fronting does not create any new binding configuration. This is in striking contrast with argument fronting. The following sets of examples illustrate this point.

(14) a. [Those pictures of himself\textsubscript{a/b}, John\textsubscript{i} thinks Bill\textsubscript{j} will buy \textit{t\textsubscript{1}}.]
   b. [Criticize himself \textsubscript{a/b}, John\textsubscript{i} thinks Bill\textsubscript{j} will not \textit{t\textsubscript{1}}. (Huang 1993:108)

(15) a. ?[How many pictures of John\textsubscript{i} do you think that \textit{he\textsubscript{i}} will like \textit{t\textsubscript{1}}?]
   b. *[How proud of John\textsubscript{i} do you think \textit{he\textsubscript{i}} should be \textit{t\textsubscript{1}}? (Huang 1993:110)

In argument fronting in (14a), the possible antecedent for the anaphor can be the subject in the matrix clause and the one in the embedded clause. However, predicate fronting exhibits no ambiguity, as illustrated in (14b). Along the same lines, argument fronting destroys an otherwise illicit binding configuration in (15a). As shown in (15b), predicate fronting does not make any contribution to the improvement of the co-reference relation. Developing Huang’s insight, Heycock (1995) and Takano (1995) arrive at the conclusion that the predicate phrase affected by predicate fronting is obligatorily reconstructed into its base-generated position in the covert cycle (see Heycock 1995 and Takano 1995 for additional evidence for this point). Whatever principle may be responsible for the mandatory reconstruction of the fronted predicate phrase into the original position, it seems that the configurations of predicate fronting and its non-fronting counterpart make no great difference in the covert cycle after reconstruction. Suppose that QR takes place in the covert cycle. After reconstruction, there seems to be nothing to prevent QR from applying to the quantifier inside the VP in the covert cycle in exactly the same way as the non-fronted sentence. From the discussion above, it follows that the frozen scope in predicate

---

4 For expository purposes, the VP-internal subject trace is disregarded here, which is important for Huang’s discussion.
fronting is not easily accounted for if QR is supposed to be movement in the covert cycle.  

In the next section, I explore the possibility that the configuration of predicate fronting differs a great deal from that of its non-fronted counterpart in the phonological cycle and the computation in this cycle plays a decisive role in frozen scope in predicate fronting.

3. Scope and Linearization
3.1 Covert Phrasal QR

In the previous section, I have suggested that the scope freezing effect in predicate fronting cannot be explained if QR is taken to be an operation after Spell-Out since the configurations of the fronted sentence and its non-fronted counterpart are virtually the same in that cycle. I would like to explore the possibility that QR takes place in the overt cycle and the scope freezing effect is derived from the PF illegitimacy. More precisely, the phonological component cannot properly linearize syntactic derivations in which quantified expressions inside the fronted predicate phrase move out of the phrase via QR.

The covert phrasal movement (Pesetsky 2000; see also Fox and Nissenbaum 1999) paves the way for investigating this possibility. Let me first review how quantificational expressions take their scope in the covert phrasal movement approach. It is argued that quantifiers move to a designated position for their scope taking in the overt cycle and they are pronounced in their original position as if they had not moved. As Pesetsky (2000) discusses, an indication of QR as covert phrasal movement can be found in ACD, already given in (8) and repeated here as (16).

(16) Dulles suspected everyone who Angleton did [VP e].

The elided VP needs a linguistic expression in the form of suspected t as its antecedent. As we have already touched on, if the VP in (16) is copied into the elided VP as it is, this creates another elided VP, that is, the infinite regress problem. It has been argued that the antecedent containment relation is resolved by application of QR. Suppose that QR is feature movement in the covert cycle. This is not enough to form the appropriate antecedent for the elided VP in the ACD construction. If it were phrasal movement, the desired configuration would be available, as illustrated in (17).

(17) [TP [DP everyone who Angleton did [VP e]]1 [TP Dulles [VP suspected t1]]]

However, this phrasal movement must be covert in that the quantified expression in (16) apparently does not move. Even if quantifiers move in the overt cycle, they must be pronounced in-situ. Let us postulate the following Pronunciation Rule for QR.

(18) Pronunciation Rule for QR
QR is covert, in that a quantifier is pronounced in its original position.
Given this approach, scope ambiguity in (19a) arises from the derivations in (19b) and (19c), which are transferred to the phonological cycle by Spell-Out and are interpreted in the semantic component.\(^5\)

(19)  
\[\begin{align*}
\text{a. Someone loves everyone.} & \quad \exists \forall, \forall \exists \\
\text{b. } [\text{TP someone} [\text{VP everyone}_1 [\text{VP loves } t_1]]] & \quad \exists \forall \\
\text{c. } [\text{TP everyone}_1 [\text{TP someone} [\text{VP loves } t_1]]] & \quad \forall \exists
\end{align*}\]

QR can target either VP or TP, and attachment to the former delivers a narrow construal of the QRed quantifier and that to the latter a wide scope reading. Despite of its great import at LF, the choice of the adjunction sites makes no substantial contribution to PF. Whether the quantifier adjoins to VP or TP, it is pronounced in its original position by virtue of the Pronunciation Rule in (18).

Inquiring into this view seriously, it would follow that movement takes place only in one cycle, that is, the overt cycle, and the overt/covert distinction is reduced to the choice of the pronounced copy at the phonological component, which is regulated by the Pronunciation Rules, such as (18).\(^6\)

3.2 Linearizing Chains

In the previous section, it was argued that QR is covert phrasal movement in that the operation affects the entire category and the dislocation is masked with the Pronunciation Rule in (18). QR is special since moved constituents are pronounced at their new position in most cases (see footnote 6). The question arises as to why a lexical element must be pronounced in a unique position, irrespective of whether it is pronounced at the derived position or at the original position.

In a series of works on linearization by Nunes (1999, 2001), he argues that the operation Chain Reduction in (20) must apply to non-trivial chains at the phonological component, otherwise, the phrase structure involving non-trivial chains cannot be properly mapped into a legitimate linear order.

(20) Chain Reduction  
Delete the minimal number of copies of a non-trivial chain CH that suffices for CH to be mapped into a linear order in accordance with the LCA.

(Nunes 2001:308)

---

\(^5\) For the preservation of the one-to-one correspondence between the LF representation and the semantic interpretation, I assume that scope ambiguity arises from the two derivations. The discussion below does not depend on this assumption, however.

\(^6\) The discussion on the pronunciation pattern in which a highest/leftmost copy of a chain is pronounced can be found in Bobaljik (1995), Brody (1995) and Pesetsky (1998).
A phrase marker is mapped onto a linear order through the Linear Correspondence Axiom (LCA) proposed by Kayne (1994). Through the LCA, asymmetric c-command relations between non-terminal nodes in the syntactic object are translated into precedence relations in a linear order. Nunes claims that if Chain Reduction does not apply to non-trivial chains, the yielded linear order violates the antisymmetry of a linear order, which Kayne (1994) claims is one of defining properties of a linear ordering. According to antisymmetry, if a lexical item X precedes another lexical item Y, Y does not precede X. Suppose that, the phrase marker containing the non-trivial chain of *John* in (21a) were to be linearized without applying the operation Chain Reduction in (20). The multiple occurrences of copies of a single lexical element *John* could be found in the PF representation in (21b).

(21) a. \[TP \text{John}_1 \text{was} [VP \text{kissed John}_1]\]  
  b. John was kissed John

The lexical item *John* precedes the predicate *kissed* and at the same time, the latter precedes the former, which is clearly in violation of antisymmetry.

Notice that Chain Reduction is defined over chains of lexical elements, but not multiple occurrences of copies of non-distinct lexical items, as Nunes (2001) argues. Given this, the c-command relation between chain members is important under the assumption that there must be a c-command relation between chain links in a chain. This consideration delivers a good consequence to us. A new account can be provided for the facts traditionally excluded by the Proper Binding Condition (PBC) initially introduced by Fiengo (1977) and formulated as (22) by Saito (1989). The proper binding effect can be found in the example in (23).

(22) Traces must be bound. (Saito 1989:187)

(23) *[Which picture of t1]2 do you wonder who1 John likes t2? (Saito 1989:187)

The trace in the fronted *wh*-phrase is not bound by the antecedent *wh*-phrase *who*, which violates the PBC. Under the copy theory of movement, the narrow syntactic derivation in (24) should be shipped to the phonological cycle by Spell-Out.

(24) \[CP [which picture of who1]2 do you wonder [CP who1 John likes [which picture of who1]2]]

---

7 On the basis of this view, I will examine anaphoric relations, assuming that an anaphor is a residue of overt A-movement proposed by Hornstein (2001) and Lidz and Idsardi (1998).

8 While Nunes does not deal with the proper binding effect, he presents several arguments for the import of the c-command relation between chain members for linearization.

9 It has sometimes been argued that the proper binding effect can be reduced to a locality principle of movement (e.g., Fukui 1999 and Kitahara 1997). However, Saito (2001) and Takahashi (to appear) reveal that the effect is irreducible to a locality principle of movement.
Let us concentrate on the non-trivial chains created by the two instances of wh-movement. The non-trivial chain of the wh-phrase headed by which picture counts as a licit chain to which Chain Reduction can apply since the chain links are in a c-command relation. Consequently, all the chain members but one are deleted. In contrast, multiple copies of the wh-phrase who survive in the final representation, violating antisymmetry. This is because the copy inside the wh-phrase in the matrix precomplementizer position is not in a c-command relation with other copies, which prevents Chain Reduction from applying to these copies.

Bearing the covert phrasal QR in the previous section and the import of the c-command relation between copies for linearization in the phonological cycle, let us move back to the frozen scope in predicate fronting, which is repeated here as (25) for expository purposes.

(25) [Teach every student]₁, no one will t₁. Neg>∀, *∀>Neg (Huang 1993:125)

Given the covert phrasal approach, the narrow syntactic derivations in (26a) and (26b) are transferred to the phonological cycle. The derivations in (26a) and (26b) are understood to be the narrow scope and the wide scope interpretations of the universal quantifier, respectively, in the semantic component.

(26) a. [[[VP [every student]₁ [VP teach [every student]₁]]₁ [TP no one will t₂]]] Neg>∀

     b. [[[VP teach [every student]₁]₂ [TP [every student]₁ [TP no one will t₂]]]\∀>Neg

In (26a), the quantifier adjoins to the VP via QR in the overt cycle and the VP subsequently moves to the designated position.¹⁰ It is clear that the non-trivial chain of the universal quantifier is subject to Chain Reduction in the phonological component because the head of the chain c-commands its lower copy. The universal quantifier is pronounced in its original position by virtue of the Pronunciation Rule in (18). In the PF representation, a unique linear position is assigned to the universal quantifier, observing antisymmetry. Notice, however, that the copy of the QRed universal quantifier in the TP-adjoined position does not c-command the copy of the same lexical item in the fronted predicate phrase in (26b) in which the universal quantifier adjoins to TP for its wide scope. The absence of the c-command relation blocks deletion of the unnecessary copies, as we have already argued. Thus, multiple copies of a single lexical item can be found in the resulting linear order. This is in violation of antisymmetry and the derivation in (26b) crashes at PF. The only derivation that can be properly linearized is (26a) in which the universal quantifier falls under the scope of the subject quantifier. This is the reason for the scope freezing effect in predicate fronting. More generally, a legitimate linear order cannot be assigned to the phrase marker in which quantifiers inside the fronted predicate phrase move out of the phrase via QR. This suffices to derive the descriptive generalization in (7).

¹⁰ Movement of the lower segment of the VP is not allowed in (26a) on the standard assumption that segments are invisible to syntactic operations.
Several qualifications must be in order here. First, scope ambiguity can be observed in cases where the two quantified expressions belong to the fronted predicate phrase. This has been shown in (6b), which is repeated here as (27).

\[(27) \ [\text{Give something to everyone}]_1, \text{John did } t_1. \quad \exists > \forall, \ \forall > \exists\]

In this case, the adjunctions of the quantifiers to VP suffice to yield scope ambiguity. If QR is completed at the VP level, the c-command relations between the copies of the quantifiers are preserved even after predicate fronting, as we have already seen in (26a). The second concern is scope ambiguity in topicalization of the quantifier in (5b). The relevant fact is presented here again.

\[(28) \ [\text{Some boy}]_1, \text{every girl is fond of } t_1. \quad \exists > \forall, \ \forall > \exists\]

In the covert phrasal QR, the existentially quantified expression moves either to the VP-adjoined position or to the TP-adjoined position for its own scope taking in the overt cycle. After QR, it undergoes movement to the position designated for topicalization. Of particularly significance is that topicalization after QR does not destroy the already established c-command relation among the chain links. Therefore, a unique linear position can be assigned to the existentially quantified expression, whether the adjunction is carried out to VP or to TP.\(^1\) This delivers both a narrow and a wide scope construal of some boy in (28). In contrast to topicalization of the quantifier in (28), the quantifier is embedded inside the predicate phrase in predicate fronting. This prevents the copy of the quantifier inside the predicate phrase and the one in the TP-adjoined position from being in a c-command relation in (26b), yielding the frozen scope.

In this section, I have suggested that a legitimate linear order does not arise from the phrase marker in which the quantifier affected by predicate fronting moves out of the fronted predicate phrase via QR in the overt cycle. This is the principled account for the generalization in (7).

4. Concluding Remarks

In this paper, it has been established that quantifiers cannot move out of the fronted predicate phrase in predicate fronting via QR, giving rise to the frozen scope. Following Heycock’s and Takano’s insights about predicate fronting, it has been argued that the frozen scope cannot be attributed to the computation in the covert cycle. The proposed account for the frozen scope is that a unique linear position is not assigned to the quantifier adjoining to TP via QR in the overt

---

\(^1\) One problem is that the quantifier is pronounced in its new position, violating the Pronunciation rule in (18). All that we need to resolve this problem is to assume the Pronunciation Rule for topicalization, which forces topicalized phrases to be pronounced in their derived position. In addition, this rule must outrank the Pronunciation Rule in (18).
cycle. Since predicate fronting destroys the chain of this QR, this prevents the application of Chain Reduction to this chain.\textsuperscript{12} This picture being correct, QR should take place in the overt cycle. The existence of covert phrasal movement would bring substantial implications for future investigation of movement and the syntactic model.

References


\textsuperscript{12} The suggested idea that there must be a c-command relation between chain links in interpreting chains will be elaborated in the following way at the talk, taking into account the discussion concerning anaphoric relations. I will suggest that although a head of a chain needs to c-command every lower copy for linearization, it does not matter whether lower chain members are in a c-command relation.