Deletion of ordering statements as a multidominance-compatible PF repair mechanism

Introduction. I argue for the deletion of ordering statements as a repair mechanism for unlinearizable orderings. This procedure allows for the linearization of parallel structures such as right node raising (RNR) and provides a PF account of covert movement.

Background. Mathematically, a linear order can be modelled as a relation over lexical items, *i.e.*, a set of ordered pairs of lexical items <*x*, *y*> such that *x* precedes *y*. I refer to such ordered pairs as **ordering statements**. Since Kayne (1994), it has been widely accepted that linear order is determined in large part (if not entirely) by syntactic structure, and that a linear order must be asymmetric, transitive, and total. However, contemporary views of movement as (Re-)Merge lead to problematic reflexivity and symmetry in syntax: a moved constituent c-commands itself and both c-commands and is c-commanded by any constituent it crosses over. These symmetric structures map onto reflexive and symmetric ordering statements, violating the condition that a linear order be asymmetric.

There are two general approaches to this problem. The first is to introduce a PF repair mechanism for unlinearizable orderings. This approach is associated with the copy theory of movement, where orderings are made linearizable by deleting all but one copy of a moved constituent (*e.g.*, Nunes 2004; but see Sheehan 2013). The second approach is to modify the linearization algorithm (or the syntactic primitives on which the algorithm depends) so that reflexive and symmetric ordering statements are not generated in the first place. Authors proposing multidominance tend to take this approach, although specific proposals vary (*e.g.*, Citko 2005, Wilder 2008, Bachrach & Katzir 2017).

I argue for a PF-repair approach that is compatible with both the copy theory and multidominance theory. Specifically, I propose that unlinearizable orderings can be repaired by deleting ordering statements. Because this proposal does not depend on the deletion of copies, it is compatible with multidominance.

Theoretical framework. The specific implementation that I adopt is **Flexible Cyclic Linearization (FCL)**, an extension of Fox & Pesetsky's (2005) **Cyclic Linearization (CL)**. In both CL and FCL, Spell-Out happens in phases, with no distinction between the phase and the Spell-Out Domain. Additionally, both proposals impose a constraint on linearization, **Order Preservation (OP)**, which prevents the deletion of ordering statements established in earlier phases. The proposals differ in two ways. First, in CL, only the most recent Merge counts for linearization, whereas in FCL, all positions count for linearization. Second, FCL allows for the deletion of ordering statements *in the phase in which they arise* as necessary for linearization. The deletion of ordering is constrained by OP and by the requirement that a linear order be asymmetric, transitive, and total. These latter two constraints restrict the deletion of ordering statements, generally preventing unmotivated deletions.

Right node raising. Consider (1). I assume that RNR involves sharing (marked by co-indexation) without overt across-the-board movement (see Bachrach & Katzir 2017, a.o.). Spell-Out of [$_{vP}$ *found* [$_{DP}$ *the book*]] in (1) leads to the ordering statements in (2), while Spell-Out of [$_{vP}$ *took* [$_{DP}$ *the book*]] leads to the ordering statements in (3). For ease of illustration, I remain agnostic on the algorithm that generates ordering statements and ignore displacement other than RNR.

1. Darius found and Jasmine took the book.
   [$_{CP}$ [$_{\&P}$ [$_{TP}$ Darius [$_{vP}$ found [$_{DP}$ the book]$_i$]] [$_{\&'}$ and [$_{TP}$ Jasmine [$_{vP}$ took [$_{DP}$ the book]$_i$]]]]]
2. <*found*, *the*>, <*found*, *book*>, <*the*, *book*>
3. <*took*, *the*>, <*took*, *book*>, <*the*, *book*>

<*Darius*, *found*>	<*Darius*, *and*>	<*Darius*, *Jasmine*>	<*Darius*, *took*>	<*Darius*, *the*>	<*Darius*, *book*>
	<*found*, *and*>	<*found*, *Jasmine*>	<*found*, *took*>	**<*found*, *the*>**	**<*found*, *book*>**
		<*and*, *Jasmine*>	<*and*, *took*>	<*and*, *the*>	<*and*, *book*>
			<*Jasmine*, *took*>	<*Jasmine*, *the*>	<*Jasmine*, *book*>
				<*took*, *the*>	**<*took*, *book*>**
	~~<*the*, *and*>~~	~~<*the*, *Jasmine*>~~	~~<*the*, *took*>~~	~~<*the*, *the*>~~	**<*the*, *book*>**
	~~<*book*, *and*>~~	~~<*book*, *Jasmine*>~~	~~<*book*, *took*>~~	~~<*book*, *the*>~~	~~<*book*, *book*>~~

Table 1: Ordering statements generated by Spell-Out of CP in (1). Ordering statements in bold were generated in an earlier phase. Strikethrough denotes ordering statements deleted under repair.

Spell-Out of CP then leads to the ordering statements in Table 1. Ordering statements in bold were established in prior (vP) phases, and are thus protected by OP. Here, reflexive (*e.g.*, <*the*, *the*>) and symmetric (*e.g.*, <*the*, *Jasmine*> and <*Jasmine*, *the*>) ordering statements arise involving the shared constituent [$_{DP}$ *the book*], so the ordering in Table 1 requires repair.

Under this proposal, the ordering statements <*the*, *took*>, <*book*, *took*>, and <*book*, *the*> are deleted, because they contradict the orderings established in the vP phases. Next, the reflexive ordering statements <*the*, *the*> and <*book*, *book*> are deleted. This leaves several symmetric orderings. If we delete the orderings <*and*, *the*>, <*Jasmine*, *the*>, <*and*, *book*>, and <*Jasmine*, *book*> this will lead to a non-transitive ordering. For example, if we delete <*and*, *the*>, preserving <*the*, *and*>, this will lead to a non-transitive and thus unlinearizable ordering with <*the*, *and*> and <*and*, *took*> but not <*the*, *took*> (which was deleted for contradicting an earlier ordering statement). Moreover, we cannot resolve this by deleting <*and*, *took*>, since the resulting ordering would not be total. The reasoning is similar for the other ordering statements. Therefore, we must instead delete the following four ordering statements: <*the*, *and*>, <*the, Jasmine*>, <*book*, *and*>, and <*book*, *Jasmine*>. Once these ordering statements (crossed out in Table 1) are deleted, we are left with the observed linear order of the string in (1): *Darius found and Jasmine took the book.*

Optionality in FCL. In (1), there was a unique ordering that satisfied the properties of asymmetry, transitivity, totality, and OP. In other cases, there is more than one way to repair an ordering. For example, in the vP phase of (4), we have the option of linearizing *what* at either the left or right edge of the vP. If we linearize *what* at the left edge of vP, then OP will require that *what* be realized at the left edge of CP, giving overt *wh*-movement. If we linearize *what* at the right edge of vP, OP will require that *what* be realized at the right edge of CP, producing *wh-in situ*. In this way, FCL can attribute variation between overt and covert *wh*-movement to variation in linearization repair. In many cases, if not in general, FCL can attribute cross-linguistic variation in where a constituent is realized to differences in how linear order is repaired.

4. What did you see?
   [$_{CP}$ What$_i$ did you$_j$ [$_{vP}$ what$_i$ you$_j$ see what$_i$]].

References. Bachrach, A. & Katzir, R. 2017. Linearizing structures. **Citko, B. 2005.** On the nature of Merge: Internal Merge, External Merge, and Parallel Merge. **Fox, D. & Pesetsky, D.** Cyclic linearization of syntactic structure. **Kayne, R. 1994.** *The antisymmetry of syntax.* **Nunes, J. 2004.** *Linearization of chains and sideward movement.* **Sheehan, M. L. 2013.** Some implications of a copy theory of labeling. **Wilder, C. 2008.** Shared constituents and linearization.