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

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How Many Mothers? Multidominance in Syntax
June 24, 2023

1 Introduction

- In this talk, I argue for the deletion of ordering statements as a repair mechanism for linearization.
- This proposal, in combination with Order Preservation (Fox & Pesetsky, 2005a), can linearize multidominant right node raising structures.
- It also allows us to attribute certain types of cross-linguistic variation (e.g., wh-movement vs. wh-in situ) to language-specific choices in how to repair linearizations.

2 Background

- Following Kayne (1994), we can model the output of linearization—an **ordering**—as a binary relation, a set of ordered pairs (of terminal nodes or lexical items, depending on the formulation).
  - I refer to ordered pairs of terminal nodes/lexical items as **ordering statements**.
- An ordering needs to be a linear order, that is, it needs to have certain properties[1]:

(1) **Linear order**: A linear order is a binary relation that is transitive, total, and asymmetric.

(2) **Transitive**: Let R be a binary relation over a set S. Then R is transitive if for all $x, y, z \in S$, if $\langle x, y\rangle \in R$ and $\langle y, z\rangle \in R$, then $\langle x, z\rangle \in R$.

(3) **Total (connected)**: Let R be a binary relation over a set S. Then R is total if for all distinct $x, y \in S$, it is the case that $\langle x, y\rangle \in R$ or $\langle y, x\rangle \in R$.

[1] For some authors (e.g., Fox & Pesetsky, 2005a; Sheehan, 2013), an ordering does not need to be a *linear* order, as long as its transitive closure is.

(4) **Asymmetric**[2]: Let R be a binary relation over a set S. Then R is asymmetric if there is no $x, y \in S$ such that both $\langle x, y\rangle \in R$ and $\langle y, x\rangle \in R$.

- An asymmetric relation is necessarily irreflexive.

(5) **Irreflexive**: Let R be a binary relation over a set S. Then R is irreflexive if there is no $x \in S$ such that $\langle x, x\rangle \in R$.

- It is generally accepted that a linear order is determined at least in part by the syntactic structure.

- However, contemporary views of movement as (re-)Merge lead to 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:

(6) a. $[_{\text{CP}}$ what$_i$ did $[_{\text{TP}}$ you $[_{\text{VP}}$ see what$_i]]]$
b. *what*$_i$ c-commands itself; *what*$_i$ both c-commands and is c-commanded by *you*, etc.

- In general, reflexivity and symmetry in syntax leads to reflexive and symmetric ordering statements, so we do not get a linear order (because we do not get asymmetry).

- There are two general approaches to this problem:

(7) **Repair approaches**: Introduce a PF repair mechanism to eliminate violations of asymmetry.

(8) **Redefinition approaches**: Define the linearization algorithm (or the primitives on which it is based) so that reflexive and symmetric ordering statements do not arise in the first place.

- The repair approach is strongly associated with copy theory, where copies of a moved constituent are deleted to resolve reflexivity and symmetry (Nunes, 2004, but see Sheehan, 2013).

- On the other hand, authors who assume multidominance tend to take a redefinition approach to linearization, although specific proposals vary.

- Examples of different proposals are given in (9).

(9) Repair and redefinition approaches in copy-theoretic and multidominance-theoretic approaches

	Copy theory	Multidominance theory
Repair	Nunes 2004	Belk et al. 2022
Redefinition	Sheehan 2013	Wilder 1999; Citko 2005; Fox & Pesetsky 2005a; de Vries 2009; Gračanin-Yuksek 2013; Bachrach & Katzir 2017; Johnson 2020

- I argue for a repair approach that is compatible with both copy theory and multidominance theory.

[2] In linguistics, this property is often called *antisymmetry*. Outside of linguistics, however, *antisymmetry* refers to a different property.

3 Theoretical framework

- The specific framework I adopt is **Flexible Cyclic Linearization** (Malanoski, forthcoming), an extension of Cyclic Linearization (Fox & Pesetsky, 2005a).
  - Flexible Cyclic Linearization is motivated by the inability of Cyclic Linearization to linearize parallel structures (unless they involve subsequent movement). See Malanoski (2023, forthcoming) for discussion.
- Like in Cyclic Linearization, Flexible Cyclic Linearization assumes:
  - linearization happens in phases;
  - linearization obeys **Order Preservation**: ordering statements generated in one phase cannot be deleted in a subsequent phase;
  - there is no distinction between the phase and Spell-Out Domain—the entire phase is transferred; and
  - the contents of a phase are still accessible after it is spelled out.
- Unlike in Cyclic Linearization, under Flexible Cyclic Linearization:
  - every position in which a constituent appears is taken into account during linearization (rather than only its highest remerge position); and
  - ordering statements can be deleted *in the phase in which they arise* as necessary to linearize a structure (see also Johnson, 2012, 2020).
- In other words, Fox & Pesetsky (2005a) adopt a redefinition approach to asymmetry violations: they define the linearization algorithm so that it only pays attention to one position in which a constituent occurs.
- Flexible Cyclic Linearization is a repair approach: ordering statements can be deleted if linearization would not otherwise succeed.
- Some important notes:
  - The requirements of totality and transitivity restrict the deletion of ordering statements: if we delete too many, we may end up with a relation that is not total and/or transitive.[3]
  - We can adopt the deletion of ordering statements as a repair mechanism without otherwise adopting Flexible Cyclic Linearization (although Order Preservation is also necessary to my account of the phenomena discussed below).
  - Because linearization generates ordering statements regardless of whether we adopt copy theory or multidominance theory, this repair mechanism is compatible with either.

[3] If we adopt the transitive closure approach to linearization (see fn. 1), then the constraints on the deletion of ordering statements are weaker: we can delete ordering statements in such a way that the resulting relation is not transitive or total, as long as its transitive closure is.

- Now that we've introduced the deletion of ordering statements as a repair mechanism, we have two relations over lexical items. Modifying Fox & Pesetsky's (2005b) terminology, I refer to these as follows:

  (10) **Provisional ordering**: The binary relation over lexical items initially produced by the linearization algorithm, before repair has taken place.

  (11) **Definitive ordering**: The binary relation over lexical items produced by repairing the provisional ordering.

- The definitive ordering must be a linear order, whereas the provisional ordering need not be.[4]

4 Right node raising

- Flexible Cyclic Linearization can linearize multidominant structures.
- Consider the right node raising (RNR) structure (12). I assume that RNR involves multidominance (at least sometimes; see Belk et al., 2022 for evidence).
- Some expository notes:
  - I use co-indexation to indicate constituent identity, so that the two instances of *the book* in (12) are occurrences of the same constituent.
  - I ignore displacement other than RNR. This does not affect the points under discussion.
  - I remain agnostic on the algorithm that generates ordering statements, and take for granted that it generates usual English word order.

(12) Darius found and Jasmine took <u>the book</u>.

$[_{\text{CP}}\ [_{\&\text{P}}\ [_{\text{TP}}\ \text{Darius}\ [_{\text{vP}}\ \text{found}\ [\text{the book}]_i]]\ [_{\&'}\ \text{and}\ [_{\text{TP}}\ \text{Jasmine}\ [_{\text{vP}}\ \text{took}\ [\text{the book}]_i]]]]]$

- Spell-Out of $[_{\text{vP}}$ found the book] and $[_{\text{vP}}$ took the book] will generate the ordering statements in (13) and (14), respectively.
- No repair is necessary for either.

(13) Provisional and definitive ordering for $[_{\text{vP}}$ found the book].

$$\left\{ \begin{matrix} \langle found, the \rangle & \langle found, book \rangle \\ & \langle the, book \rangle \end{matrix} \right\}$$

(14) Provisional and definitive ordering for $[_{\text{vP}}$ took the book].

$$\left\{ \begin{matrix} \langle took, the \rangle & \langle took, book \rangle \\ & \langle the, book \rangle \end{matrix} \right\}$$

[4] In fact, the provisional ordering may not even be a (partial or total) order in the set theoretic sense.

- Spell-Out of the CP will generate the provisional ordering in (15).

(15) Provisional ordering for the CP in (12). Ordering statements in bold were generated in a prior phase.

$$\left\{\begin{array}{cccccc}
\langle \mathit{Darius}, \mathit{found}\rangle & \langle \mathit{Darius}, \mathit{and}\rangle & \langle \mathit{Darius}, \mathit{Jasmine}\rangle & \langle \mathit{Darius}, \mathit{took}\rangle & \langle \mathit{Darius}, \mathit{the}\rangle & \langle \mathit{Darius}, \mathit{book}\rangle \\
 & \langle \mathit{found}, \mathit{and}\rangle & \langle \mathit{found}, \mathit{Jasmine}\rangle & \langle \mathit{found}, \mathit{took}\rangle & \boldsymbol{\langle \mathit{found}, \mathit{the}\rangle} & \boldsymbol{\langle \mathit{found}, \mathit{book}\rangle} \\
 & & \langle \mathit{and}, \mathit{Jasmine}\rangle & \langle \mathit{and}, \mathit{took}\rangle & \langle \mathit{and}, \mathit{the}\rangle & \langle \mathit{and}, \mathit{book}\rangle \\
 & & & \langle \mathit{Jasmine}, \mathit{took}\rangle & \langle \mathit{Jasmine}, \mathit{the}\rangle & \langle \mathit{Jasmine}, \mathit{book}\rangle \\
 & & & & \boldsymbol{\langle \mathit{took}, \mathit{the}\rangle} & \boldsymbol{\langle \mathit{took}, \mathit{book}\rangle} \\
 & \langle \mathit{the}, \mathit{and}\rangle & \langle \mathit{the}, \mathit{Jasmine}\rangle & \langle \mathit{the}, \mathit{took}\rangle & \langle \mathit{the}, \mathit{the}\rangle & \boldsymbol{\langle \mathit{the}, \mathit{book}\rangle} \\
 & \langle \mathit{book}, \mathit{and}\rangle & \langle \mathit{book}, \mathit{Jasmine}\rangle & \langle \mathit{book}, \mathit{took}\rangle & \langle \mathit{book}, \mathit{the}\rangle & \langle \mathit{book}, \mathit{book}\rangle
\end{array}\right\}$$

- (15) is not asymmetric, and thus requires repair.
- First, we delete the reflexive ordering statements: ⟨*the*, *the*⟩ and ⟨*book*, *book*⟩.
- Second, we delete the ordering statements that violate Order Preservation: ⟨*the*, *took*⟩, ⟨*book*, *took*⟩ and ⟨*book*, *the*⟩.[5]
- Resolving the remaining symmetry—⟨*the*, *and*⟩, ⟨*the*, *Jasmine*⟩, ⟨*book*, *and*⟩ and ⟨*book*, *Jasmine*⟩ vs. ⟨*and*, *the*⟩, ⟨*Jasmine*, *the*⟩, ⟨*and*, *book*⟩ and ⟨*Jasmine*, *book*⟩—is a more complicated task.
  - If we delete ⟨*and*, *the*⟩ in favor of ⟨*the*, *and*⟩, then we will be left with a non-transitive ordering. For example, we would have ⟨*the*, *and*⟩ and ⟨*and*, *took*⟩ but not ⟨*the*, *took*⟩ (which was deleted to satisfy Order Preservation). We cannot resolve this failure of transitivity by deleting ⟨*and*, *took*⟩, because then *and* would not be ordered with respect to *took*—the ordering would not be total. Thus, we must keep ⟨*and*, *the*⟩, instead deleting ⟨*the*, *and*⟩.
  - If we delete ⟨*Jasmine*, *the*⟩ in favor of ⟨*the*, *Jasmine*⟩, then we will be left with a non-transitive ordering. For example, we would have ⟨*the*, *Jasmine*⟩ and ⟨*Jasmine*, *took*⟩ but not ⟨*the*, *took*⟩ (which was deleted to satisfy Order Preservation). We cannot resolve this failure of transitivity by deleting ⟨*Jasmine*, *took*⟩, because then *Jasmine* would not be ordered with respect to *took*—the ordering would not be total. Thus, we must keep ⟨*Jasmine*, *the*⟩, instead deleting ⟨*the*, *Jasmine*⟩.
  - If we delete ⟨*and*, *book*⟩ in favor of ⟨*book*, *and*⟩, then we will be left with a non-transitive ordering. For example, we would have ⟨*book*, *and*⟩ and ⟨*and*, *took*⟩ but not ⟨*book*, *took*⟩ (which was deleted to satisfy Order Preservation). We cannot resolve this failure of transitivity by deleting ⟨*and*, *took*⟩, because then *and* would not be ordered with respect to *took*—the ordering would not be total. Thus, we must keep ⟨*and*, *book*⟩, instead deleting ⟨*book*, *and*⟩.

[5] Strictly speaking, the ordering statements themselves do not violate Order Preservation. The real problem is symmetry: the provisional ordering contains ⟨*the*, *took*⟩, ⟨*book*, *took*⟩ and ⟨*book*, *the*⟩, but also ⟨*took*, *the*⟩, ⟨*took*, *book*⟩ and ⟨*the*, *book*⟩. The latter three ordering statements were established in an earlier phase, so deleting them would violate Order Preservation. Thus, there is no choice but to delete the three ordering statements indicated above.

    - If we delete $\langle Jasmine, book\rangle$ in favor of $\langle book, Jasmine\rangle$, then we will be left with a non-transitive ordering. For example, we would have $\langle book, Jasmine\rangle$ and $\langle Jasmine, took\rangle$ but not $\langle book, took\rangle$ (which was deleted to satisfy Order Preservation). We cannot resolve this failure of transitivity by deleting $\langle Jasmine, took\rangle$, because then *Jasmine* would not be ordered with respect to *took*—the ordering would not be total. Thus, we must keep $\langle Jasmine, book\rangle$, instead deleting $\langle book, Jasmine\rangle$.
    - To summarize, there is only one way to resolve the remaining symmetry, namely by deleting $\langle the, and\rangle$, $\langle the, Jasmine\rangle$, $\langle book, and\rangle$ and $\langle book, Jasmine\rangle$.
- Deleting the indicated ordering statements produces the definitive ordering in (16). This corresponds to the observed linear order in (12) (one can see this more clearly by looking at ordering statements along the diagonal).

(16) Definitive ordering for the CP in (12). Ordering statements in bold were generated in a prior phase.

$$\left\{\begin{array}{cccccc}
\langle Darius, found\rangle & \langle Darius, and\rangle & \langle Darius, Jasmine\rangle & \langle Darius, took\rangle & \langle Darius, the\rangle & \langle Darius, book\rangle \\
 & \langle found, and\rangle & \langle found, Jasmine\rangle & \langle found, took\rangle & \boldsymbol{\langle found, the\rangle} & \boldsymbol{\langle found, book\rangle} \\
 & & \langle and, Jasmine\rangle & \langle and, took\rangle & \langle and, the\rangle & \langle and, book\rangle \\
 & & & \langle Jasmine, took\rangle & \langle Jasmine, the\rangle & \langle Jasmine, book\rangle \\
 & & & & \boldsymbol{\langle took, the\rangle} & \boldsymbol{\langle took, book\rangle} \\
 & & & & & \boldsymbol{\langle the, book\rangle}
\end{array}\right\}$$

5 Optionality in Flexible Cyclic Linearization: Covert movement

- Flexible Cyclic Linearization also provides an account of variation between overt and covert movement.[6]
- Consider (17). For expositional purposes, I ignore head movement.
- Spell-Out of the vP will produce the ordering statements in (18).
- We delete the reflexive ordering statement $\langle what, what\rangle$.
- We then have to resolve the remaining symmetry ($\langle what, you\rangle$ and $\langle what, see\rangle$ vs. $\langle you, what\rangle$ and $\langle see, what\rangle$).
- Crucially, no other factor (Order Preservation, totality, transitivity) determines whether to keep the former pair of ordering statements ($\langle what, you\rangle$ and $\langle what, see\rangle$) or the latter pair ($\langle you, what\rangle$ and $\langle see, what\rangle$).
- It must be a language-specific property that decides which ordering statements to delete in this case. Since English has overt wh-movement, we must assume that it chooses the ordering statements in (19).

[6] This account is essentially a multidominance-compatible implementation of Bobaljik's (2002) proposal, where the difference between overt and covert movement amounts to which copy is pronounced.

(17) What did you see?

$[_{\text{CP}}$ what$_i$ did you$_j$ $[_{\text{vP}}$ what$_i$ you$_j$ see what$_i]]$

(18) Provisional ordering for $[_{\text{vP}}$ what$_i$ you see what$_i]$.

$$\left\{\begin{array}{ccc} \langle what, you\rangle & \langle what, see\rangle & \langle what, what\rangle \\ & \langle you, see\rangle & \langle you, what\rangle \\ & & \langle see, what\rangle \end{array}\right\}$$

(19) Definitive ordering for $[_{\text{vP}}$ what$_i$ you see what$_i]$.

$$\left\{\begin{array}{cc} \langle what, you\rangle & \langle what, see\rangle \\ & \langle you, see\rangle \end{array}\right\}$$

- Spell-Out of the CP then produces the provisional ordering in (20).[7]
- First, we delete the reflexive ordering statements, $\langle what, what\rangle$ and $\langle you, you\rangle$.
- Second, we delete the ordering statement that violates Order Preservation, $\langle you, what\rangle$.
- We are then left with a pair of symmetric ordering statements, $\langle what, did\rangle$ and $\langle did, what\rangle$. As in the vP, we assume that English chooses $\langle what, did\rangle$, since it linearizes *what* at the left edge of the clause.
- This leaves (21), which generates the observed linear order in (17).

(20) Provisional ordering for the CP in (17). Ordering statements in bold were generated in a prior phase.

$$\left\{\begin{array}{cccc} \langle what, did\rangle & \boldsymbol{\langle what, you\rangle} & \boldsymbol{\langle what, see\rangle} & \langle what, what\rangle \\ & \langle did, you\rangle & \langle did, see\rangle & \langle did, what\rangle \\ & \langle you, you\rangle & \boldsymbol{\langle you, see\rangle} & \langle you, what\rangle \end{array}\right\}$$

(21) Definitive ordering for the CP in (17). Ordering statements in bold were generated in a prior phase.

$$\left\{\begin{array}{ccc} \langle what, did\rangle & \boldsymbol{\langle what, you\rangle} & \boldsymbol{\langle what, see\rangle} \\ & \langle did, you\rangle & \langle did, see\rangle \\ & & \boldsymbol{\langle you, see\rangle} \end{array}\right\}$$

- What would have happened if we had instead chose $\langle you, what\rangle$ and $\langle see, what\rangle$ in the vP phase, giving (22)?
- We would get covert movement!

[7] I assume that the vP ordering is not recalculated, so we do not re-generate $\langle see, what\rangle$. This is not crucial, as Order Preservation would force us to delete that ordering statement anyway.

(22) Another possible definitive ordering for [$_{\text{vP}}$ what$_i$ you see what$_i$].

$$\left\{\begin{matrix} \langle you, see\rangle & \langle you, what\rangle \\ & \langle see, what\rangle \end{matrix}\right\}$$

- Spell-Out of the CP would produce the provisional ordering in (23). This is the same as (20), except that Order Preservation now protects different ordering statements.
- Again, we delete the reflexive ordering statements.
- Then we delete the ordering statements that violate Order Preservation. In this case, that is $\langle what, you\rangle$ and $\langle what, see\rangle$.
- We are then left with the symmetric ordering statements $\langle what, did\rangle$ and $\langle did, what\rangle$.
  - If we keep $\langle what, did\rangle$, then we have a non-transitive ordering with $\langle what, did\rangle$ and $\langle did, see\rangle$ but not $\langle what, see\rangle$ (which was deleted because of Order Preservation). We cannot resolve this by deleting $\langle did, see\rangle$, or else the ordering will not be total.
  - Thus, in this case, we have no choice but to keep $\langle did, what\rangle$.
- Deleting the indicated ordering statements leaves (24), which generates (25), corresponding to covert movement.

(23) Provisional ordering for the CP in (17) given (22). Ordering statements in bold were generated in a prior phase.

$$\left\{\begin{matrix} \langle what, did\rangle & \langle what, you\rangle & \langle what, see\rangle & \langle what, what\rangle \\ & \langle did, you\rangle & \langle did, see\rangle & \langle did, what\rangle \\ & \langle you, you\rangle & \boldsymbol{\langle you, see\rangle} & \boldsymbol{\langle you, what\rangle} \\ & & & \boldsymbol{\langle see, what\rangle} \end{matrix}\right\}$$

(24) Definitive ordering for the CP in (17) given (22). Ordering statements in bold were generated in a prior phase.

$$\left\{\begin{matrix} \langle did, you\rangle & \langle did, see\rangle & \langle did, what\rangle \\ & \boldsymbol{\langle you, see\rangle} & \boldsymbol{\langle you, what\rangle} \\ & & \boldsymbol{\langle see, what\rangle} \end{matrix}\right\}$$

(25) * Did you see what?

- While this is obviously incorrect for English, an overt wh-movement language, this example illustrates that variation between overt and covert movement can be attributed to language-specific choices about how to repair asymmetry violations in the vP.

6 Discussion

- Key points:
  - I proposed the deletion of ordering statements as a linearization repair mechanism.
  - In combination with Order Preservation, this allows us to linearize multidominant RNR structures (and other types of parallel structures, not discussed here).
  - It also provides a multidominance-compatible version of Bobaljik's (2002) analysis of overt and covert movement.
- There are three types of asymmetry violations, each with different outcomes:
  - Contradiction in the current phase: Because Order Preservation plays no role, there is optionality (i.e., room for variation) in how the contradiction is repaired.
  - Contradiction between an earlier phase and the current phase: Order Preservation protects the earlier ordering statements, so the relevant ordering statements from the current phase will be deleted.
    - The operation that led to the ordering contradiction is "covert" in that it does not affect the linearization.
  - Contradiction between earlier, parallel phases: Order Preservation protects the ordering statements from both phases, so the contradiction cannot be resolved, leading to ungrammaticality (for an example, see the discussion of the Edge Restriction in appendix A).
- In many cases, if not in general, we can attribute variation in where a constituent is realized to variation in how invalid linearizations are repaired. In other words, we can maintain an algorithm based on asymmetric c-command (for example) for the generation of ordering statements.[8]
  - See Malanoski (2023) section 4 and fn. 7, respectively, for an extended discussion of scattered deletion and a brief discussion of word order variation.

[8] If we want to maintain something like Kayne's (1994) proposal for generating ordering statements, then we have to follow Nunes (2004) in assuming that the algorithm pays attention to occurrences rather than constituents. This is because a moved constituent reflexively c-commands itself and symmetrically c-commands the constituents it crosses over—we do not get asymmetric c-command between these constituents. In the absence of asymmetric c-command, we will not get a total order, and a failure of totality cannot be resolved by deleting ordering statements. On the other hand, the higher occurrence of a moved constituent asymmetrically c-commands the lower occurrence. Likewise, the higher occurrence of the constituent asymmetrically c-commands the occurrences of constituents it crosses over, which asymmetrically c-command the lower occurrence of the moved constituent. Thus, an algorithm based on asymmetric c-command between occurrences rather than constituents will provide a total order. See Collins & Stabler (2016) for a definition of occurrences in a multidominance-based framework.

6.1 Why we can't just delete copies

- A natural question is how the deletion of ordering statements relates to the deletion of copies: do both have a role to play?
- I argue that copy deletion should be supplemented or replaced by ordering statement deletion.
- Under Nunes's (2004) proposal, violations of asymmetry are resolved by deleting all but one copy of a constituent (in the general case), as formalized in (26) (= Nunes, 2004, (44)).

(26) **Chain Reduction**: Delete the minimal number of constituents of a nontrivial chain CH that suffices for CH to be mapped into a linear order in accordance with the LCA.

- However, this is not a solution to the formal problem of asymmetry.
- Recall that an ordering is a binary relation, which needs to be asymmetric to be grammatical.
- Chain Reduction deletes constituents. It does not delete ordered pairs (ordering statements) from the ordering. In fact, it does not affect the ordering whatsoever.
- Thus, Chain Reduction cannot make an ordering asymmetric.
- There are several possible solutions:
    - **Solution 1**: Have Chain Reduction precede linearization.
        - If Chain Reduction precedes linearization, then we can generate an asymmetric ordering without the need for repair.
        - However, if Chain Reduction is motivated by linearization (Nunes, 2004), then this creates a look-ahead problem.
        - Thus, this solution is conceptually problematic, unless something else triggers Chain Reduction before linearization.
    - **Solution 2**: Linearize again after Chain Reduction.
        - The logic here is the same as in solution 1: if Chain Reduction precedes linearization, then we get an asymmetric ordering.
        - However, since linearization is the trigger for Chain Reduction, the order of operations must be linearization first, then Chain Reduction, then linearization again (replacing the results of the first linearization).
        - This is not an elegant solution, but it does not seem to have any fatal flaws, either.
    - **Solution 3**: Delete ordering statements that reference the deleted copies.
        - If, after Chain Reduction, we delete the ordering statements that involve deleted copies, that will resolve the asymmetry violation.

- However, we do not need to delete the copies themselves.
- For example, if we assume that copies with unchecked features get deleted (Nunes, 2004), then we can instead delete the ordering statements that include such copies without deleting the copies themselves. As argued above, this is sufficient to determine where to pronounce a constituent.
- Thus, Chain Reduction is redundant; we can just delete ordering statements.[9,10]

- So, if we adopt the copy theory, then there seem to be two real options: linearize again after Chain Reduction, or forego Chain Reduction entirely in favor of deleting ordering statements.
- The latter option is arguably preferable, at least insofar as it is compatible with multidominance as well.

Appendices

A Deriving the properties of RNR

- The **Edge Restriction**: In RNR, the gap corresponding to the shared material must be final in non-final conjuncts (Bachrach & Katzir, 2017).[11]
  - Consider (27).
  - When [$_{\text{vP}}$ found [the book]$_i$ at home] is spelled out, *the book* is ordered before *at home*.
  - When [$_{\text{vP}}$ took [the book]$_i$] is spelled out, *the book* is ordered after *took*.
  - When the CP is spelled out, *at home* is ordered before *took*.
  - This produces a contradiction: *the book* must be precede *at home*, which must precede *took*, which must precede *the book*.
  - None of the relevant ordering statements can be deleted without violating either Order Preservation or totality.
  - Thus, (27) cannot be linearized. This derives the Edge Restriction.

(27) * Darius found at home and Jasmine took the book.

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9 In fact, this is how Johnson (2012, 2020) implements Chain Reduction, although he ultimately rejects a repair approach.

10 Strictly speaking, deletion of ordering statements is sufficient only if we assume that syntactic structure is paired with phonological content post-syntactically (e.g., Halle & Marantz, 1993). If lexical items enter the syntax with phonological features, then we still need something like Chain Reduction, or else we expect that each copy's phonological features will be expressed.

11 In left node raising, the gap must be initial in non-initial conjuncts.

$[_{\text{CP}}$ $[_{\text{\&P}}$ $[_{\text{TP}}$ Darius $[_{\text{vP}}$ found [the book]$_i$ at home]] $[_{\text{\&}'}$ and $[_{\text{TP}}$ Jasmine $[_{\text{vP}}$ took [the book]$_i$]]]]]

- **Right node wrapping**: In RNR, the shared material may be non-final in the final conjunct, a configuration known as right node wrapping (Whitman, 2009).
  - Consider (28).
  - When $[_{\text{vP}}$ washed [the dishes]$_i$] is spelled out, *the dishes* is ordered after *washed*.
  - When $[_{\text{vP}}$ put [the dishes]$_i$ away] is spelled out, *the dishes* is ordered after *put* and before *away*.
  - When the CP is spelled out, *the dishes* can be linearized in the second conjunct without violating Order Preservation. That is, in the position it is pronounced in (28), it follows *washed* and *put* and precedes *away*.
  - All else being equal, right node wrapping does not produce unresolvable ordering contradictions.

(28) Nkiru washed and Yngvarr put the dishes away.
$[_{\text{CP}}$ $[_{\text{\&P}}$ $[_{\text{TP}}$ Nkiru $[_{\text{vP}}$ washed [the dishes]$_i$]] $[_{\text{\&}'}$ and $[_{\text{TP}}$ Yngvarr $[_{\text{vP}}$ put [the dishes]$_i$ away]]]]]

- The material that undergoes RNR need not be a constituent (Abbott, 1976).
  - This is straightforward. Under this account, RNR arises through the interaction of (i) the deletion of ordering statements and (ii) Order Preservation, a condition on their deletion. Neither makes reference to constituency, so we do not expect RNR to be limited to constituents.
- RNR can occur outside of coordination (Hudson, 1976).
  - This is similarly straightforward. Neither Order Preservation nor the repair mechanism are specific to coordination. Since these are responsible for deriving RNR, RNR should not be limited to coordination either.
  - *A priori*, we expect RNR to be possible wherever parallel phases—phases not in a dominance relationship with each other—occur.
- **Left node raising**, the mirror-image of RNR, is possible in some languages (Bachrach & Katzir, 2017).
  - This is also straightforward. Neither Order Preservation nor the repair mechanism are specific to the right edge. If shared material is linearized at the left edge of parallel phases, then we predict left node raising.
  - The present account predicts that, *mutatis mutandis*, the properties discussed above will be shared by left node raising.

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