Multi Dominance and Right Node Raising

It is common these days to think of displacement as involving multi-dominance (e.g. "internal merge"). But even if this view is adopted there is a debate on the scope of multi-dominance. (Can there only be "movement" to a c-commanding position, or is there also "sideward movement", "parallel merge" etc.?)

Plan:
1. To begin this week with what I think is a beautiful argument for multi-dominance, and specifically that a phrase can be in two positions without there being a c-command relationship between them. Empirical Focus: RNR and in particular the Right Edge Restriction on RNR (also apparent insensitivity to islands).
2. To continue next-week with issues for a multi-dominance analysis for cases where there is a c-command relationship between the two positions (internal merge). Empirical Focus: Movement, Scope and Binding (in particular cases that motivate the claim that two positions in a movement chain can be distinct.)

Reading for next week; Fox, Larson, Sportiche.

1. Formal Choice-Points

1.1. A rather minimal view of syntactic structure

(1) **Recursive Definition of a Language (with multi dominance everywhere)**
Let LEX be a set of lexical items.
The set of potential phrases projected from LEX is the minimal set L such that
  a. LEX $\subseteq$ L
  b. If X$\in$L and Y$\in$L then Merge(X,Y)$\in$L
  [*where Merge(X,Y) is a syntactic phrase with daughters X and Y which inherits its syntactic category (label) from X, sometimes written as {X, {X,Y}}*]

This might look like a definition of language without movement (only external merge) but actually it is a language with multi-dominance everywhere. Consider, e.g:

Merge(Merge(like, **Mary**), **Mary**)

This syntactic phrase has *Mary* in two positions, both as a "daughter" and as "granddaughter".

Two Problems:
1. We need to distinguish two cases:
   a. External Merge of phrase in two different positions (e.g., ***A bishop*** *met* ***a bishop*** *in the courtyard…* which is never thought to involve multi-dominance).
   b. Displacement (e.g., ***a bishop*** *is likely* ***t*** *to meet a bishop in the courtyard* which is sometimes thought to involve multi-dominance).

   In the language generated by (1), if the same lexical item appears in two positions in a phrase, this must involve multi-dominance.
2. We might want to incorporate familiar ideas about the constraints on displacement, according to which something special needs to be done in order to form multi dominance, e.g. identifying a phrase α within a phrase β that dominates α (allowing us to appeal to concepts such as *minimal search*).

1.2. Blocking Multi-Dominance

(2) **Recursive Definition of a language with no multi dominance**
Let LEX be a set of lexical items. We will call LEX-T, the set of tokens of LEX:
LEX-T:=$\{<l,i>: l\in LEX, i\in N\}$ (We can write l_i instead of $<l,i>$)

The set of potential phrases projected from LEX-T, L, is the minimal set L such that

a. LEX-T $\subseteq$ L
b. If X$\in$L and Y$\in$L and there is no Z such that X and Y both domainate Z, then Merge(X,Y)$\in$L

Or alternatively:

(2) **Recursive Definition of a language with no multi dominance (O'brien (7))**
The set of *possible workspaces W* is the minimal set such that

a. If $N \subseteq$ LEX-T, then $N \in W$. (Numeration)
b. If $\{A,B, C^1,..., C^n\} \in W$ then $\{\text{Merge}(A,B), C^1,..., C^n\} \in W$

L_{NMD} is the union of all workplaces in *W*.

1.3. Re-introducing limited Multi-Dominance (Internal Merge)

(3) **Recursive Definition of a language with movement (viewed as internal merge)**
Let LEX-T be our set of lexical item tokens.
The set of potential phrases projected from LEX-T is the minimal set L such that

a. LEX-T $\subseteq$ L
b. If X$\in$L and Y$\in$L and there is no Z such that X and Y both domainate Z, then Merge(X,Y)$\in$L
c. If X$\in$L and there is a phrase α dominated by X (and Head(X) has a feature of type Z that matches a feature on α), then Merge(X, α)$\in$L

Well-known Problem for everything we've done: The sets are way too big.
As we all know, they *generate many structures that are not attested.*

Familiar hope: We can spell out further constraints that would explain unattested structures (constraints on interpretability, on probe goal relationships, on the realization of agreements, etc.)

Converse Problem: The set is too small
There are structures that are not generated by (3) which have been argued to exist.

1. ATB Movement
2. Late Merge (as well the type of manipulations suggested in Chomsky 1993, discussed by Larson)
3. Tucking-in
4. Potential cases involving Multi-dominance of unmoved constituents (RNR, apparent "coordination of unlikes" *what and when did you eat?*, Gracanin Yukshek)

Goal: To try to understand the nature of the missing syntactic structures and the consequences for the theory of structure building. Our focus will be on RNR and LM.

2. RNR – Three Proposals

What distinguishes between the two sentences in (4)?

(4) a. Mary likes the teacher and John hates the teacher.
b. Mary likes and John hates the teacher.

Three Claims:

1. ATB movement to the right:
   [John bought__] and [Mary read__] this book
2. Deletion at the left:
   [John bought ~~this book~~] and [Mary read this book]
3. Multi-Dominance (Sharing):
   - Like deletion in that the pivot appears twice, but unlike deletion in that there is just one object which appears in two locations, i.e. has two distinct mothers.
   - Like ATB movement (under some analyses) but without the step of internal merge to a c-commanding position.

Arguments Against backwards deletion: we don't we see the kind deletion proposed in other contexts?

(5) ***No backward ellipsis elsewhere***
a. Mary likes the teacher. That John doesn't ~~likes the teacher~~ is worrisome
b. *That John doesn't ~~likes the teacher~~ is worrisome. Mary likes the teacher.

(6) ***No DP deletion in English***
a. Mary likes the teacher. *John hates ~~the teacher~~
b. *John hates ~~the teacher~~. Mary likes the teacher.

Arguments Against ATB Movement:

a. Island Insensitivity (perhaps not as compelling as it seems on first site given observations of Sabbagh, 2005 and Bacharch and Katzir, 2009, section 8 below)
b. Right Node Wrapping: pivot of RNR can precede constituents that belong to the second conjunct only

(7) *Island Insensitivity of RNR*
Mary knows the person who likes __and John knows the person who hates the teacher.

(8) *Right Node Wrapping* (O'brien's (25))
a. "I've got friends in low places, where the whiskey drowns _ and the beer chases **my blues** away." (Garth Brooks via Whitman)
b. I defiled _ and then turned **the homework assignment** into a paper airplane.
c. Garth should polish _ and then give **the slide guitar** to Merle.

3. The Right Edge Restriction as an argument for MD

(9) a. *I gave__a present and congratulated **all the winners.**

b. I gave a present to__ and congratulated **all the winners.**

c. I gave to Mary and bought for Sue **the book reviewed yesterday in the NYT.**

(10) **Right Edge Restriction (RER)**: RNR is acceptable only if the non-final conjunct (when uttered in isolation) is acceptable with the pivot in the rightmost position.

Wilder's main Argument for multi-dominance: The RER follows from Multi-dominance and a general schema for linearization (a modified version of Kayne's LCA).

Turns out (observed by Sabbagh): Wilder's actual proposal fails to deliver the RNR.

O'brien: Wilder's argument can be resurrected, in a much simpler format (remaining fairly neutral about the specifics of a linearization algorithm)

4. What is multi-dominance?

4.1. Basic idea:

(11) **Simple Recursive Definition of a language with multi dominance**
Let LEX-T be our set of lexical item tokens.
The set of potential phrases projected from LEX-T is the minimal set L such that
a. LEX-T $\subseteq$ L
b. If X$\in$L and Y$\in$L then Merge(X,Y)$\in$L
[*where Merge(X,Y) is a syntactic phrase with daughters X and Y which inherits its syntactic category (label) from X, sometimes written as {X, {X,Y}}*]

Under this definition a single constituent, SM, can be merged with two separate constituents A and B.

We can call an instance of MD "standard movement" when one of SM's sisters (say A) dominates SM. [But we still need to say how movement is special and how it is restricted e.g. by locality considerations.]

When neither sister dominates the other, we have something that might be the input to ATB movement, and could also be thought of as something that yields RNR (without ATB movement).

4.2. Partial vs. Full Domination

If multi-dominance structures exist, we need to redefine basic notions:

(12) Standard definition of mother (no multi-dominance):1
X is *the* mother of Y if $\exists$Z(X=Merge(Y,Z) or X=Merge(Z,Y))

(13) Standard definition of domination (reflexive; no multi-dominance):
X dominates Y if
a. X =Y or

[1] I call this standard, but it, of course, presupposes Bare Phrase Structure (i.e. that all nodes are branching).

b. X dominates the mother of Y

Two notions of Dominations

(14) Just like (12) but with *the* → *a*:
X is *a* mother of Y if ∃Z(X=Merge(Y,Z) or X=Merge(Z,Y))

(15) Partial domination (reflexive):
X p-dominates Y if
a. X = Y or
b. X p-dominates a mother of Y.

(16) Full-domination (reflexive):
X f-dominates Y if
a. X = Y or
b. X f-dominates every mother of Y.[2, 3]

5. Wilder's derivation of the RER

Goal: Multi-dominance can be linearized but only if RER is satisfied.

5.1. Kayne 1994

(17) LS(S) = {⟨x,y⟩: x and y are terminals, and ∃X∈S ∃Y∈S, s.t.
a. X dominates x and
b. Y dominates y and
c. X asymmetrically c-commands Y and
d. X is a head or a maximal projection}[4]

LCA: LS(S) must be a total ordering.

5.2. Wilder's adaptation of Kayne

To accommodate multi-dominance, we need to know what we mean in (17) by dominates (are we talking f-, or p-domination?) and by c-command.

Dominates must be f-dominates, otherwise multi-dominance structures will always involve ordering contradictions.[5]

In order for the (terminals f-dominated by) shared material, SM, to be ordered relative to all other terminals, Wilder provides a definition of c-command under which SM is c-

[2] Note that there is an implicit argument missing here, as pointed out by O'brien. Specifically what are the constituents we are quantifying over here (what are the set of mothers that need to be considered)? See section 6.
[3] Bachrach and Katzir provide a different definition, designed to derive a purpose for successive cyclic movement.
[4] (d) is Wilder's replacement for Kayne's claim that an X' category doesn't c-command its sister/specifier.
[5] I use the term contradiction to refer to a case where there are n terminals $a_1 \ldots a_n$ with the following ordered pairs $\langle a_1, a_2\rangle, \ldots \langle a_1, a_n\rangle, \langle a_n, a_1\rangle$, i.e., to what we might call a loop.

commanded by the nodes that only-p-dominate it. (x only-p-dominates y if [x p-dominates y] but ¬[x f-dominates y]).

(18) x W-c-commands y if
a. x does not f-dominates y and
b. x has a mother that p-dominates y.[6]

To me this seems like a very odd definition. First there is the arbitrary choice between f- and p-domination. Second, it seems to me different from the definition relevant for binding/scope:

(19) x c-commands y (for binding): if x has a sister that p-dominates y

(20) LS(S) = {⟨x,y⟩: x and y are terminal nodes and ∃X∈S ∃Y∈S, s.t.
a. X f-dominates x
and
b. Y f-dominates y
and
c. X asymmetrically W-c-commands Y
and
d. X is a head or a maximal projection}[7]

It also makes the prediction that SM will pushed to the right relative to material that is dominated by the constituents that only-p-dominate SM. This is wrong if we want to analyze “Left-Node-Raising” on a par with RNR, as argued for by B&K (see O’brien).

5.2. When SM is rightmost in both conjuncts[8]

Suppose that SM is final within the first and second conjunct – more precisely that it’s in a position that would be linearized last if there were no sharing. How would the structure be linearized?

(21) [[XP…SM] [and [YP…SM]]]

SM is W-c-commanded by XP and YP[9] (and not vice-versa) hence will be linearized after the terminals dominated by XP and YP which are not shared (the f-dominated terminals).

If this ordering is not contradicted by the other orderings we get from W-c-command relations within XP and YP, things will be OK. Since SM does not (W-)c-command anything, there will be no contradictions.

[6] In (20-21) wilder gives a different definition, where (b) requires all nodes dominating x to dominate y, but, as far as I can see, the definition he implicitly assumes is mine. Under his definition shared material, SM, will not be able c-command material in the nodes that only-p-dominate SM, contrary to what Wilder wants.
[7] (d) is Wilder’s replacement for Kayne’s claim about specifiers.
[8] My presentation anticipates Sabbagh’s fatal observation discussed in 5.3.
[9] Wilder’s paper is based on the (implicit) assumption that YP doesn’t c-command SM, a wrong assumption (see Bachrach and Katzir 2009, appendix on Wilder).

5.3. When SM is not rightmost in both conjuncts

If SM W-c-commands something in XP, we will have a contradiction.

(22) [[$_{XP}$…SM AP] [and [$_{YP}$…SM]]]

SM (W-)c-commands AP (and not vice-versa).[10] Hence we get ⟨s, *a*⟩ where s is a terminal (f-)dominated by SM and *a* is a terminal (f-)dominated by AP.

However, as mentioned, XP (W-)c-commands SM (and not vice-versa). We thus get ⟨a, s⟩.

This explains the ill-formedness of (9)a [assuming the Larsonian structures, crucial for Kayne's LCA].

(9)a *I gave__a present and congratulated all the winners.

6. Sabbagh's fatal observation

SM can be non-final within XP without c-commanding anything:

(23) *I gave many of__a medal and congratulated all of **the winners**
.

7. O'brien's Innovation

Ordering by Full Domination (OFD): Consequences of precedence relations among non-terminals for the ordering of terminals are based on f-domination (Wilder's Intuition).

Suppose that X precedes Y and x and y are terminals p-dominated by X and Y respectively. By OFD x will precede y only if x and y if this is not just p-domination, i.e. only if there is an f-domination. But to determine this, we have to know how far we can look.

It is easy to see this if we take a derivational perspective on ordering. Suppose, for example, that when Merge(A,B) applies the syntax of the language tells us how the terminals of A and B are linearized.

By OFD this should have consequences only for the f-dominated terminals, i.e. only for those terminals that are dominated by A and not by B (and the other way around).

(24) Precedence has Consequences for F-Dominated terminals
A precedes B yields the following ordering statements
{*a*<*b*: A f-dominates *a* within Merge(A,B) and B f-dominates *b* within Merge(A,B)}

(25) Full-domination (reflexive):
X f-dominates Y *within S* if
a. X = Y or
b. X f-dominates every mother of Y within S
(i.e., every mother p-dominated by S, or equivalently f-dominated by S within S).

[10] See note 6.

So if linearization applies at every step of Merge, we will not yet have information about the positions in which terminals might find themselves at later stages of the derivations.

This very local perspective on ordering derives the RER.

Good Cases of RNR, e.g. [[$_{P1}$ *Mary likes__*][$_{P2}$ *and John hates the teacher*]].

- Right after P_1 is formed by merge we get (because *the-teacher* is still f-dominated by the VP *likes the* .
  Likes <the-teacher
  (*Mary <the-teacher* redundant to be ignored from now on)

- Right after P_2 is formed by merge we get:
  John < hates
  hates <the-teacher

- After P_1 and P_2 are can add to this:
  Mary < and
  likes < and
  but crucially not *the-tearcher<and* since the teacher is no-longer f-dominated by P_1

Bad Cases of RNR, e.g. I [[$_{P1}$ gave__a present][$_{P2}$ *and congratulated* ***all the winners***]].

- Right after P_1 is formed by merge we get (because *the-teacher* is still f-dominated by the VP *likes the teacher*):
  gave <all-the-winners
  all-the-winners < a-present

- Right after P_2 is formed by merge we get:
  and < congradulated
  congratulated <all-the-winners

- After P_1 and P_2 are can add to this:
  gave < and
  a-present < and

  still not *the-tearcher<and* since the teacher is no-longer f-dominated by P_1. But still this is enough to have an ordering contradiction.

8. Islands in RNR

(7) *Island Insensitivity of RNR*
Mary knows the person who likes __and John knows the person who hates the teacher.

Looks like an argument against ATB movement, but (a) Sabbagh points out that the Pivot can move covertly out of the island, and (b) B&K pointed out that it can move overtly.

(26) a. John wrote a paper that criticizes **every Idea I've ever come up with**.
(impossible: $\forall > \exists$)

a. John wrote a paper that criticizes__ or published a paper that refutes **every Idea I've ever come up with**. (possible: ∀>or>∃)

(27) a. * John wrote an abstract that criticizes **every proposal I thought he might <write an abstract that criticizes >** .

a. ? John wrote an abstract that criticizes or published a paper that refutes **every proposal I thought he might <write a paper that criticizes or publish a paper that refutes>** .

(33) Josh knows someone who speaks every Germanic language.
(*Someone* > *Every*; **Every* > *Someone*)

(34)a. John knows [someone who speaks _], and Bill knows [someone who wants to learn _], **every Germanic language**.
(*Someone* > *Every*; *Every* > *Someone*)

b. A different doctor asked [who last used _], and a different nurse will find out [who sold _], **every stethoscope in the ER**.
(*A different doctor/nurse* > *Every*; *Every* > *A different doctor/nurse*)

(40) The nurse tried to find out who gave flu shots to _, and who administered blood tests for _, **each of the same patients that the doctor also did Δ**.

Δ = try to find out who gave flu shots to x and administered blood tests for x.

Sabbagh's conclusion: we need to find a theory of islands that would allow their obviation in RNR environments.

B&K pointed the following as criticism of the specific theory that Sabbagh develops.

(2) **Which book**$_i$ did [John meet the man who wrote t_i], and [Mary meet the woman who published t_i]?

(28) a. *Which book did Mary meet the woman who wrote__?

b. ? Which book did Mary meet the woman who wrote__ and John meet the woman who published?

Way of stating all of this (along the lines of B&K but somewhat more neutrally):

(29) **Movement of α crosses an island** if before movement the island f-dominates α and after movement the island no-longer f-dominates **α.**

Or

(30) **Constraint on Internal Merge:** α can merge with a constituent β that (f/p-)dominates α only if there is no island (f/p-)dominated by β, γ, such that γ f-dominates α within β.

(31) **Recursive Definition of a language with island sensitive movement and multi-dominance**

Let LEX-T be our set of lexical item tokens.

The set of potential phrases projected from LEX-T is the minimal set L such that

a. LEX-T $\subseteq$ L
b. If X$\in$L and Y$\in$L and neither dominates the other, then Merge(X,Y)$\in$L
c. If X$\in$L and there is a phrase α dominated by X (and Head(X) has a feature of type Z that matches a feature on α), then Merge(X, α)$\in$L [where checking for feaure matching is subject to familiar locality conditions…]