Linearization and its discontents

Robert Levine
Ohio State University

1 Overview

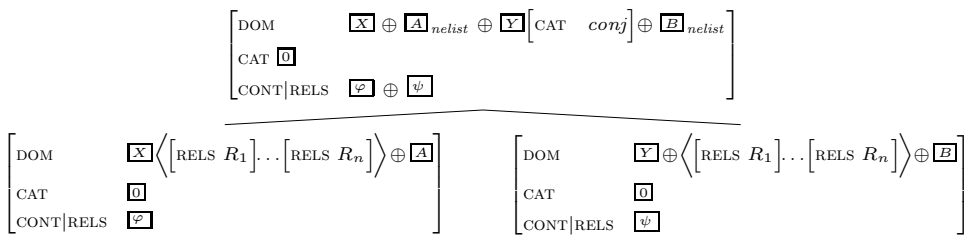
During much of the past decade, the so-called linearization framework originally introduced to handle word order issues in HPSG has been recruited to solve a variety of problems arising from coordination facts, especially nonconstituent coordination (NCC) and the coordination of unlike categories (UCC), as explored in inter alia Yatabe 2001, Beavers and Sag 2004, Chaves 2006, Chaves 2007, Yatabe 2007 Chaves 2008, Chaves and Sag 2009 and Hofmeister 2010, whose consistent theme is the use of linearization-based ellipsis (LBE) to handle these phenomena. But for the most part, the data in these paper has not so much tested LBE as illustrated, in a kind of simplest-case way, how the approach is intended to work for non-canonical coordination phenomena. In fact, on any of its formulations in the sources cited, LBE makes significant mispredictions in connection with both Left Peripheral Ellipsis (LPE) and unlike category coordination. I very briefly review the typical LBE approaches to these phenomena, summarizing the properties of the constructional rules for coordination; I then adduce several different kinds of data sets, each of which poses severe problems for extant formulations of the LBE analysis. My conclusion is that the linearization-based proposals for the difficult coordinations alluded to are currently nothing more than sketches which may or may not prove feasible when the necessary level of explicit detail is added.

2 NCC via LPE

On the account offered in most of the current HPSG literature appealing to linearization, the sentences in (1) are consequences of a single constructional condition on coordination statable as (2):

(1) a. I gave Robin a book on Thursday and (I) gave Robin a journal subscription on Friday.
b. I gave Robin a book on Thursday and a journal subscription on Friday.

(2)



On the parse [DOM $\xi \bigoplus \langle$*I, gave Robin, a book, on Thursday*$\rangle \bigoplus \langle$*and*$\rangle \bigoplus \langle$*(I,) gave, Robin, a journal subscription, on Friday*$\rangle$], with ξ the empty list, (2) licenses (1)a; but the parse [DOM$\langle$*I, gave, Robin*$\rangle \bigoplus \langle$*a, book, on Thursday*$\rangle \bigoplus \langle$*and*$\rangle \bigoplus \langle$*(I,) gave, Robin a journal subscription on Friday*$\rangle$] yield a DOM value correspnding to (1)b. Chaves and Sag (2009) give as a success of this approach the argument that it immediately captures the ambiguity of sentences such as *Most of the Western states went to Gore in 2000 and went to Kerry in 2004* (their example (82), p.38) by predicting the scope of the quantifier *most of the Western states* over the conjunction when the syntax represents VP coordination, with elision of only *went*, but not when two complete sentences are conjoined, as in *Most of the Western states went to Gore in 2000 and ~~most of the Western states went~~ to Kerry in 2004*, where both elisions are predicted by (2).

But this success is illusory, as is evident when we consider examples such as (3):

(3) a. Nothing bothers Robin or annoys Leslie =
b. Nothing bothers Robin and nothing annoys Leslie $[\forall x \neg B(r)(x) \wedge \forall x \neg A(l)(x)] \neq$
c. Nothing bothers Robin or nothing bothers Leslie. $[(\forall x \neg B(r)(x) \vee \forall x \neg A(l)(x))]$

When *nothing* denotes the anti-additive quantifier rather than a reification of nonexistence, there is only one reading available, given by (3)b—the conjunction of negations which entailed under the De Morgan equivalences from the logical form $\forall x \neg (B(r)(x) \vee A(l)(x))$, which corresponds to the conjunction of VPs [$_{S}$ *nothing* [$_{VP}$ [$_{VP}$ *bothers Robin*] [$_{VP}$ *or annoys Leslie*]]]. The reading in (3)c, which by (2) is precisely the one that would be available under LPE of the second token of *nothing* under clausal conjunction i.e., *Nothing bothers Robin or ~~nothing~~ bothers Leslie*, is disallowed.[1] It follows either that ellipsis of the subject must, inexplicably be blocked in the case of (3)c, or that, contrary to the Principle of Semantic Composition (Chaves and Sag 2009, their (74), p. 33) embodied in (2), the operation of ellipsis somehow induces an interpretation based on the single DOM list token of *nothing*, which is then somehow given wide scope. Neither possibility is allowed for in the framework defined by Beavers and Sag 2004 or its descendents, and both fall foul of Chaves and Sag's own *Western states* example alluded to, or simpler examples such as *A letter from the University arrived for Terry in London and for Chris in Paris; Terry's offered her a faculty position, and Chris' informed him that he had been accepted into the Philosopy graduate program*, which must be analyzed as *A letter from the University arrived for Terry in London and and ~~a letter from the University arrived~~ for Chris in Paris*, where the sentence is unexceptionable under the assumption that different letters are involved. An ad hoc prohibition on ellipsis of *negative* quantifiers, extending Hofmeister's proposal (2010, p. 308) that 'negation is simply not elidable', might suggest itself at this point, since such a stipulation would account both for the lack of an interpretation (3)c, so that only the VP coordination source of (3)a was allowed. But whether or not such a suggestion proves viable in general for the negative *not* and forms with negative contraction, it cannot possibly explain the parallel effect that one sees in data such as (4)-(5), where again no ambiguity is present, but where the nonconstituency of the coordinations makes it clear that ellipsis of the negative quantifier must have occurred.

(4) a. Terry said nothing about Robin on Thursday or Leslie on Friday.
b. Terry said nothing about Robin on Thursday or ~~(Terry) said nothing about~~ Leslie on Friday.
c. [$_{\zeta}$ Terry said nothing about Robin on Thursday] or [$_{\varrho}$ (Terry) said nothing about Leslie on Friday]. [$\neg\zeta \vee \neg\varrho$]

(5) a. Terry said nothing about Robin on Thursday or about Leslie on Friday.
b. Terry said nothing about Robin on Thursday or ~~(Terry) said nothing~~ about Leslie on Friday.

In both (4) and (5), the sole interpretation is a conjunction of negations, so that the interpretation under *or* requires, as in (3), that negation in the tectogrammatical input outscope the disjunction, as per the De Morgan equivalence. What is crucially different in these data, as compared with (3), is the lack of any 'pre-elision' source for the a. cases in which the two daughers can be combined under *or* disjunction so that negation outscopes the disjunction. The *only* structure which disjoins daughters so that ellipsis, as per(2), can apply to it to yield the phonetically observed form in the a. examples is the form given in the b. examples; but if ellipsis does not take place, as illustrated in the c. forms, the semantics of these structures is different from that of the ellipsed forms in exactly the same way that (3)c is with respect to (3). Nor would imposing a requirement that negators (or downward-entailing operators generally) on DOM lists outscope conjunctions to which they tectogrammatically belong be empirically viable, however one implemented it, in view of e.g. *Robin didn't know about the meeting or simply forgot about it*, where the negation scopes only over the first disjunct. The bottom line is that the meaning of the ellipsed examples in (4) and (5) which is mandated by (2) does not match the conjunction of negations which is denoted by the a. examples.

The radically different treatment of tecto- and phenogrammatical relations to semantic interpretation in Yatabe 2001, 2007 in principle permit the pattern exhibited in (3), but the details reveal no applicability to such cases, for Yatabe's account derives what explanatory force it has specifically from the fact that it distinguishes 'structural' ellipsis (suppression of whole DOM objects) from mere phonological ellipsis, which leaves scoping relations unaffected. This bifurcation gives rise to the possibility of scoping ambiguities reflected in his data, and in the data cited above from Chaves and Sag 2009, but nowhere in evidence in (3)-(5).

[1] Chaves (2007) notes that the 'exclusive' reading of *or* 'disappears... under the scope of negation', but this observation does not account for the fact that the disjunction is not in the scope of negation in the unellipsed form, but is so when ellipsis has occurred.

3 Unlike category coordination via ellipsis

3.1 Chaves's coercion approach

I next turn to the second of the LBE's 'showcase' analyses, the reduction of unlike category coordination to the coordination of like categories. Such cases are illustrated in (6):

(6) a. Pat is either stupid or a liar (Sag et al. 1985, p.117)
b. Robin walked slowly and with great care. (Sag et al. 1985, p.143)
c. There are at most two lions in the closet or lurking under the stairs.
d. I know of no triangles with equal angles but having sides of different lengths.

Much of the literature on LBE avocates a treatment of such coordination based on ellipsis. Thus (6)a-b can apparently be licensed by the constraint in (2), as in e.g. *Pat* [$_{VP}$ [$_{VP}$ *is either stupid*] or [$_{VP}$ ~~*is*~~ *a liar*]] and *Robin* [$_{VP}$ [$_{VP}$ *walked slowly*] *and* [walked with great care]]. But there are other cases which are not amenable to such treatment, such as *(Both) tired and in a foul mood, Bob packed his gear and headed North* and *Neither tired nor in a hurry, I decided to walk and save the bus fare.*, provided in Chaves 2006 (pp.111-112), where the only way to use (3) to produce the unlike category coordination that is exibited in these examples is to delete, by ellipsis, subdomains of the lefthand daughter corresponding to a token of the overt clause which heads the whole sentence: [$_{S}$ AP ~~S~~][$_{S}$ PP S]. But such an operation, informally representable as e.g. *Neither tired ~~I decided to walk and save the bus fare~~ nor in a hurry I decided to walk and save the bus far* corresponds to a completely impossible sequence when ellipsis is not enforced. In its place, Chaves posits the presence of null copula gerunds, so that the tecto structure can be abbreviated by the notation *Neither ~~being~~ tired nor ~~being~~ in a hurry, I decided to walk and save the bus fare.* These null gerunds are introduced by the '*null-copula-p(ost)i(nflectional)-cx*':

(7)

$$\textit{null-copula-pi-cx} \supset \left[\begin{array}{l} \text{MTR} \left[\begin{array}{ll} \text{PHON} & \textit{elist} \\ \text{SYN} & \left[\begin{array}{ll} \text{HEAD} & \left[\begin{array}{ll} \text{VFORM} & \boxed{2} \\ \text{NULL} & + \end{array}\right] \\ \text{VAL} & \boxed{1} \end{array}\right] \end{array}\right] \\ \text{DTRS} \left[\begin{array}{ll} \textit{copul-lxm} & \\ \text{SYN} & \left[\begin{array}{ll} \text{HEAD} & \left[\begin{array}{ll} \text{VFORM} & \boxed{2} \\ \text{NULL} & - \end{array}\right] \\ \text{VAL} & \boxed{1}\left[\begin{array}{ll} \text{SUBJ} & \textit{nelist} \\ \text{COMPS} & \left\langle \left[\text{SYN}|\text{HEAD} \left[\begin{array}{ll} \text{INDL} & - \\ \text{PRED} & + \end{array}\right]\right] \right\rangle \end{array}\right] \end{array}\right] \end{array}\right] \end{array}\right]$$

This treatment—similar in several respects to the increasing use of empty structural 'shells' headed by null functional heads in P&P analyses—supplies what is, in effect, an empty lexical category whose complements are precisely those that *be* selects, but which has no phonology, and feed other construtional rules supplying dangling participal and (possibly null-headed) absolutives. Using this approach, Chaves analyzes *Neither* $\emptyset_{being}$ *tired nor* $\emptyset_{being}$ *in a hurry, I decided to walk and save the busx fare*, and the other cases alluded to can all be treated in the same way. But again, there are abundant indications that this approach is on the wrong track.

3.2 Contraindications

There is a substantial range of cases, however for which neither the standard LBE analysis nor Chaves' coercive null-copula construction work at all.

3.2.1 Ellipsis-resistant topicalizations

Consider first the data in (8):

(8) a. Both poor and a Republican, *no one* can possibly be __.
b. Dead drunk and yet in total control of the situation, it's impossible for *anyone* to be __.
c. Equiangular but with different length sides, no triangle can be __.

As things stand, Chaves' coercion solution is unavailable for any of these examples, given the ill-formedness of their analogues with phononologically overt tokens of the copula: **Being both poor and being both a replublican, no one can possibly be.* But the only alternative under the LBE analysis for (7)a is an RNR-like treatment abbreviable as *Both poor ~~no one can possibly be~~ and a replublican, no one can possibly be* whose overt form, **Both poor no one can possibly be and a replublican, no one can possibly be* is altogether impossible along exactly the lines that Chaves assumed in proposing his null-copula alternative for data such as(6). A third alternative—to try to adapt the kind of analysis that Hofmeister 2010 provides for *either*, whereby *both* is a clausal modifier scoping over phrasal constituents under non-disjunctive coordination, and then to combine this treatment with the LBE analysis of the extraction as *Poor no one can be and a Republican no can be*—again simply does nothing more than replicate the semantic misprediction already noted, since the effect of *both* is simply to reinforce the conjunction of *Poor, no one can possibly be* with *A Republican, no one can possibly be.* The other cases in (8) lead to exactly parallel conclusions.

3.2.2 Ellipsis-resistant pseudo-clefts

Next, consider some examples of the English pseudocleft construction—a rather mysterious pairing of what seems to be a headless relative with a predicate, linked syntactically by a copula:

(9) What$_i$ Robin wanted t$_i$ was a new outboard motor.

For present purposes, the importance of pseudocleft is that the complement of the copula—the focal constituent, as it is often called—can take the form of an unlike category conjunction:

(10) a. What you cannot be(come) is highly intelligent and yet a raving fundamentalist.
b. What you cannot be(come) is ~~be(ing)~~ highly intelligent and yet ~~be(ing)~~ a raving fundamentalist.
c. *What you cannot be(come) is being highly intelligent and yet be(ing) a raving fundamentalist.

As this example shows, the null copula analysis cannot work in any variant, again leaving a 'straight' LBE analysis as the only other possibility within the linearization framework. But the possibilities here turn out to be dead ends as well: *What you cannot be(come) is highly intelligent and yet ~~is~~ a raving fundamentalist* corresponds, without elision, to the altogether ill-formed **What you cannot be(come) is highly intelligent and yet is a raving fundamentalist*, but the only other possible tectogrammatical source for (9)a would then be, without ellipsis, the source of *What you cannot be(come) is highly intelligent and yet what you cannot become is a raving fundamentalist.* Apart from contradicting Hofmeister's claim that negation is not subject to ellipsis, the critical problem with this analysis is clearly that the meaning of this coordination is completely different from that of its ellipsed version. The latter point can be amplified by examining the variant of this kind of data shown in (11):

(11) a. What you mustn't be(come) is stupid or (even) a raving fundamentalist.
b. What you mustn't be(come) is stupid or ~~what you mustn't be(come) is~~ even a raving fundamentalist.

(where the same caveats about the alternative possibilities apply, e.g., **What you mustn't be(come) is stupid or is even a raving fundamentalist*, etc.)

3.2.3 Ellipsis-resistant absolutives and other empirical difficulties

Absolutives themselves are not generally amenable to a null copula treatment. Note, e.g., *A lone Republican/Vulnerable/ Running out of options and (*being) with no place to turn, Robin was forced to switch party affiliation*, but **Robin is (being) with no place to turn.*. Chaves' coercion solution cannot apply here, simply because *with no place to turn* is non-predicative, and as a complement is incompatible the copula. And applying the coercion analysis to only the first conjunct *a lone Republican* or *vulnerable* does not help at all, since the problem merely shifts from being an unlike category coordination of NP and PP or AP and PP to a different pair of unlike categories being coordinated. A similar problem is posed by, e.g., *Vulnerable on policy issues but with few political enemies, Robin seemed like a possible fallback candidate.* Again, the only alternative analysis relies on the standard LPE treatment, which encounters all of the problems already noted, cf. *Truly an equilateral triangle and yet with unequal angles, Robin's business logo appeared to be a complete impossibility.*

A final example is the phenomenon of posthead nominal modifiers, as in *Novels full of dramatic conflict but/and yet with rigorously accurate historical detail don't exist*. The source for this sentence cannot be obtained on Chaves' null copula analysis (*Novels* $\emptyset_{being}$ *full of dramatic conflict but* $\emptyset_{being}$ *with rigorously accurate historical detail don't exist*), since the corresponding example with overt copular tokens is altogether ill-formed; nor can the standard coordination/ellipsis mechanism embodied in (3) be right, since the tectostructure involved would also have to support *Novels full of dramatic conflict don't exist but/and yet novels with rigorously accurate historical detail don't exist*, with both LPE and RPE, corresponds to nothing like the meaning of the 'ellipsed' version.

4 Conclusion

The credibility of the LBE approach to NCC and unlike category coordination rests, to a significant extent, on the degree to which the denotations of the mother in (3) reflect the denotations of the daughter sentences under the logical operator corresponding to the whichever conjunct particle appears in the coordination. The examples in the literature, intended to illustrate the LBE mechanism, are all quite well-behaved (apart from the familiar cases of symmetrical predicates in RNR, which, unfortunately, are given short shrift in the sources above, with a few paragraphs of distinctly programmatic and rather speculative attention). But there is in fact a whole range of apparently difficult cases in which the semantics of the phenogrammatical representation and the semantics of the correspnding tectogrammatical objects are not only different, but different in a way that undercuts the plausibility of the LBE approach itself. The bottom line is that such cases mandate specific operations on the DOM list, the whole point of which is to replicate the effect of simply assuming that ellipsis has not taken place and that the interaction of scopal operators can be directly 'read off' the overt form of the sentence. Similarly, the unlike category coordination cases discussed in §3 above suggest an extension of syncretic type formation discussed in Daniels 2001 to *head* subtypes, with Yatabe's earlier ideas about list-based *head* specification still another possibility which promises to avoid the difficulties for LBE posed by the examples in §3. At the moment it seems fair to say that LBE approaches to NCC and UCC face a heavy burden of proof which they have yet to meet successfully.

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