

Somber Prospects for Late Merger
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Late merger is a phrase structure theoretic composition operation proposed in Lebeaux 1991 and used by many authors ever since in a number of very influential pieces of work, for example Bhatt and Pancheva 2004, Chomsky 1993, Demirdache 2015, Fox and Nissenbaum 1999, Fox 2014, Hulsey, and Sauerland 2006, Lebeaux 2009, Stanton 2016, Takahashi and Hulsey 2009.

I will argue that this operation should not be allowed.

Why Late Merger : Lebeaux's 1991 classic Late Adjunct Merger proposal is motivated by the following asymmetry:¹

- (1) a. Which *villages* near Picasso's estate did **he_j** visit
b. * Which *pictures* of Picasso_j did **he_j** sell
c. * Whose *hypothesis* that Picasso_j was a fraud did **he_j** resent **t**

Here is the standard account in terms of Late Merger,² framed in a system that takes traces to be copies and phrase structures to be built derivationally.

The boxed relative clause in (1a) is taken to be an adjunct to the noun *pictures*, the boxed phrase in (1b, c) a complement to the noun (*pictures* or *hypothesis*). The Late Adjunct Merger analysis allows (1a) to be derived in either of the following two ways:

- (2) a. Which *villages* near Picasso's estate did **he_j** visit ~~which *villages* near Picasso's estate~~
b. Which *villages* near Picasso's estate did **he_j** visit ~~which *villages*~~

If the trace is a full copy of the moved phrase as in (2a), the (unpronounced) bottom copy (crossed out) must be interpreted; this yields a condition C effect at LF. But Late Adjunct Merger also allows the derivation in (2b) with the boxed part late merged, that is adjoined to *villages* after wh-movement, thus circumventing Condition C. (1a) with this derivation is fine.

Because the *of* phrase in (1b) or the *that* clause in (1c) is assumed to be a complement, it cannot be inserted (so³) late. Consequently, the bottom copy must contain *picture*, a complement (of the D complement of) *sell*, and *of Picasso* or the *that* clause, which are complement of the nouns. The full representation of (1b) for example must contain the substructure below, triggering a Condition C effect:

- (3) **he_j** sell ... ~~*pictures of Picasso_j*~~

¹ Such asymmetries are robust for many speakers in many languages, but not for all speakers (in any language?): this suggests the presence of at least one uncontrolled variable.

² The premises of this account have not gone unchallenged, see e.g. Sportiche, 2015. If the premises are wrong, the particulars underlying this argument for Late Merger disappear but its logic remains (see e.g. Fox and Nissenbaum's 1999, Hulsey and Sauerland 2006 or Fox 2014).

³ Lebeaux also proposes that (the content of) complements can be late inserted under limited circumstances, a precursor to Wholesale Late merger discussed below.

The availability of Late Merger non trivially increases the generative capacity of grammars. It has been established that the formal systems underlying the linguists current grammars (e.g. Minimalist Grammars with copy, see Kobele 2006) are computationally well behaved without Late Merger (Michaelis, 1998). Kobele and Michaelis (2012) shows that adding late merger increases the generative capacity of such grammars to supersets of unknown computational properties, possibly intractable. Although this not damning in itself, as some (unknown) constraint on Late merging may in fact restrict generative capacity to demonstrably tractable sets, there is a proven sense in which Late merger itself is a priori unparsimonious.

But there is also evidence that Late Merger as used by the aforementioned authors should not be allowed: as we show, because Late Merger must be able to operate within islands or be unboundedly countercyclic, this allows island violating movements, or unconstrained parasitic gaps among many other pathological cases.

Simple Late Merger

Simple Late Merger must be able to be unboundedly countercyclic: A treatment of the asymmetry above⁴ in terms of Late Adjunct Merger requires not only countercyclic syntactic operations, but an unboundedly countercyclic syntax. The countercyclicity comes from the fact that the relative clause in (1a) must be assumed to be late inserted in the position in which it is interpreted, namely inside the complement structure of the determiner of the relative clause (which, incidentally, violates Chomsky's extension condition). This insertion is countercyclic since merger is not at the edge (of the relative clause phase). But the logic of this account requires that such late merger be unboundedly countercyclic. This is illustrated by the following kind of examples:

(4) Whose criticism of [Mary's rendition of (.....) the claim [that you [formulated (...) the hypothesis [that Henri [visited the *villages* near Picasso's estate]]]]] did he_k endorse t

Such sentences with the indicated coreference are well formed. This means that the boxed adjunct must have been late inserted. But it is late adjunction to an element (*villages*) which is a recursive complement of a complement of the main head noun *criticism*. This means that none of this intervening material can be (so) late inserted: as a result, the late merger of the adjunct must take place inside the four bracketed constituents all of which are phases. It should be clear that the example can be modified so that late merger be required in an arbitrarily deeply embedded constituent, yielding unbounded countercyclicity.

Why is this undesirable: Is the fact that unboundedly countercyclic syntactic operations are allowed undesirable? Not necessarily in itself. After all, Late Merger yields structures that are readily legible, that is, readily interpretable at the LF interface by standard semantic rules. But once late merger's generative power is allowed, overgeneration ensues. Here is how. Late merger of an adjunct is usually invoked in instances of late **first** merger of this adjunct. But there is in fact no reason why it couldn't be late **remerge** since there is no theoretical difference between the operations of first merge and remerge (only the sources of the merged material differ). This second option, which in effect "fakes" a movement dependency, predicts that adjunct movement can violate (probably) any island whatsoever. To see this, consider the following representation.

⁴ Or other such cases, e.g. unbounded countercyclic cases motivated in Fox, 2014.

(5) **Near Paris** John thinks ... that you live **t**

This structure would be out if there was no trace, here **t** (= copy of) of *near Paris*, as the adjunct is not interpretively related to anything. But there are now two ways of deriving this structure with a trace.

One is the standard way: first merge *near Paris* with *live*, then remerge it higher.

The other base generates the adjunct where it appears. There is surely nothing wrong with this: since there is no theoretical difference between first merge and remerge, clefted (or topicalized, or dislocated, ...) adjuncts can in principle be first merged in their “landing” position. This would normally lead to uninterpretability, because as noted above, the adjunct is not interpretively related to anything.

But suppose that Next *near Paris* is remerged late where **t** is, yielding (5).

Since late (re)merging must be unboundedly countercyclic, this means that the three dots ... in (5) can stand for anything e.g. the null string, yielding a well formed output.

These dots can also stand for weak islands, strong islands or what have you. The prediction is that adjuncts can freely escape any island, unboundedly.

As another example, Late remerge makes it possible to create ill-formed structures mimicking any type of parasitic gap structure whatever (even with PP’s which do not allow parasitic gap structures):

(6) **Near Paris** John said [... that you live **t**] [...when a plane crashed **t**]

Here again, both **t**’s are generated by Late Merger and the three dots could stand for whatever we choose.

Wholesale Late Merger suffers from the same overgeneration problem.

Wholesale Late Merger, which allows Late merging of a complement under certain conditions (Bhatt and Pancheva, 2004, Takahashi and Hulse, 2009) I illustrated below:

(7) The conclusion that John_p had cheated seemed to him_p to be unfounded

Because coreference *him/John* is possible, it is argued by proponents of this type of Late merger (Lebeaux, 2009, Takahashi and Hulse, 2009) that the DP headed by *the* is merged as argument of *unfounded*, without its NP *conclusion that John had cheated* and that this NP is Late merged after the DP has raised to subject of the main clause. Agreeing with Lebeaux or Takahashi and Hulse’s description, let us assume a “timing constraint” on such Late merging: descriptively, this type of Late NP merger is limited to applying to a D at the latest when this D is in a Case position (so that, for Takahashi and Hulse, NP check its own Case). Now note that coordinate structures are among the islands within which Late merging can operate:

- (8) a. [The pictures that John_p likes and the books], he_p had to sell.
b. [The conclusion that John_p had cheated and the punishment] seemed to him_p to be unfounded

In both well formed examples, the boxed constituent must have been inserted late inside one conjunct of a coordinate structure to avoid a Condition C violation. The first example illustrates late adjunct merger, the second wholesale late merger.

Just like Late Adjunct merger, Wholesale late **remerge**, can “fake” (illegal) movement of e.g. NPs as in e.g. Split Topicalization (on which see Van Hoof, 2006). It can also fake NP movement involved in the promotion analysis of relative clauses, yielding pathological structures. To illustrate, some NP can be remerged to some wh-D allowed in a relativized DP regardless of where this D is. Thus it is possible to relativize from inside an island (here a pied piped DP) without movement by remerging the NP *book* as in:

- (9) a. I bought the book [[the topic of [which __ and this review]]_k [you knew about t_k]]
 b. I bought the [_{NP} book]
 [C_{rel} [the topic of [_{DP} [_{DP} [_Dwhich] [_{NP} *book*] and [_{DP} this review]]]_k [you knew about t_k]]
 c. I bought the [_{NP} book] [C_{rel} [the topic of [_{DP} [_Dwhich]]]_k [you knew about t_k]]

The relative clause in (9a) would be merged to an external NP *book* (as in matching derivations – see Hulsey and Sauerland, 2006), and this NP is late remerged to *which* inside a coordinate structure as in (9b).

Pied Piping applies legally in (9a): following Heck’s 2009 analysis, Pied piping can occur in case the wh element triggering the pied piping (here *which*) is accessible via Agree to the C probe of the relative clause C_{rel}. In (9a), it is accessible as shown by:

- ❖ the well formedness of (9c) showing that the DP containing the conjunction is pied pipable and
- ❖ the fact that Agree is able to reach into coordinations (as shown by e.g. first conjunct agreement configuration). So there is nothing wrong with pied piping per se.⁵

Late remerge of the italicized NP *book* in (9a) is not subject to the timing constraints on complement insertion (since it is already Case checked) and it can violate the coordinate structure constraint: it can thus be performed, overgenerating.

I conclude that Late Merger is not available.

This is not to say that the logical form structures produced by Late Merger are undesirable. These LFs have exactly the right desirable properties (to circumvent Condition C), but they cannot be produced by Late Merger. How then are they produced?

Contemporary theories of the syntactic computational system distinguish the derivation tree of a structure – the derivational history in terms of Merge and Move - from the maps from such a derivation tree to PF and LF representations (see Kobele, 2006, who introduces this for minimalist grammars, but the point is more general). The undesirable increase of generative capacity and the empirical problems we outlined are due to coding the origin of the desirable LFs into the derivational process itself (by allowing Late Merger). Sportiche (2015) puts forth a proposal which does not assume Late Merger, but instead constrains the way in which the map from a derivation tree to an LF is built: informally speaking, this map can “Neglect” to fully spell out the content of a trace. This way of reaching desirable LFs does not allow overcoming island violations (and does not seem to alter the generative capacity of the computational system, Gregory Kobele, p.c.). It thus looks like a promising replacement to Late Merger.

⁵ Of course, (8a) must be excluded. If Pied piping is possible why is it out? I argue elsewhere that all relatives involve promotion of the head and consequently that such cases are excluded by standard constraints on movement - here the coordinate structure constraint (thus reducing (part of) pied piping theory to movement theory, unlike e.g. Heck, 2009, who reduces it to Agree theory).

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