

On the Nature of Merge: External Merge, Internal Merge, and Parallel Merge

by Barbara Citko

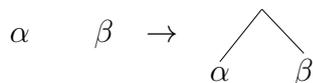
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 Course 04-046-2011/IGRA 08 (Sharing Constructions)

April 28, 2015

1 Parallel Merge

There are two well-known types of Merge:

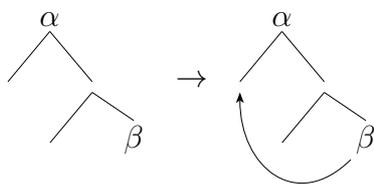
(1) External Merge



Properties:

- canonical type of Merge
- takes two distinct rooted structures and joins them into one

(2) Internal Merge

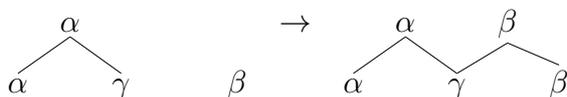


Properties:

- yields the effect of syntactic movement
- takes a subpart of an existing structure as one of the two objects
- displaced element is simply remerged (not copied, etc.)

Citko now proposes a new type of Merge which is a mixture of the two presented above, i.e. it combines the properties of internal and external Merge.

(3) Parallel Merge



Properties:

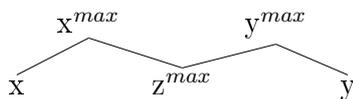
- involves two distinct rooted objects (α and β)

- combines the two by taking a sub-part of one of them
- creates symmetric structures

2 Parallel Merge and Linearization

The Problem: Kayne's (1994) Linear Correspondence Axiom (LCA)

- LCA derives linear precedence from strict asymmetric c-command.
- This bans symmetric structures from syntax.
- Thus, Parallel Merge is incompatible with the LCA.
- Bare phrase structure theory is adopted here. Thus, Parallel Merge structures look as follows:



The LCA fails to unambiguously and totally order these Parallel Merge structures:

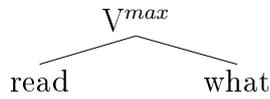
- Assume that y^{max} will c-command x^{max} in a later stage of the derivation. Thus, all terminals of y^{max} will precede the terminals of x^{max} .
- But z^{max} is part of both, which means it will end up both following and preceding itself.

The solution:

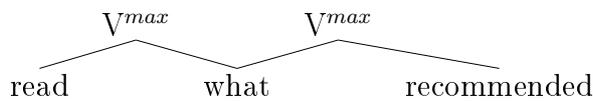
- Basic insight of the LCA: Linear ordering is part of the phonological component + can be unambiguously derived from asymmetric c-command.
- This insight is compatible with bare phrase structure and the solution lies in determining where exactly the LCA applies.
- Since the LCA is linked to pronunciation, it does not need to apply throughout the derivation, which leaves an escape hatch.
- Parallel Merge structures are allowed as long as by the time the LCA applies the shared element has undergone overt movement (and, therefore, left the shared node, where the element cannot be linearized).
- Consequently, Parallel Merge is allowed, if its effect is not visible in the end.

3 A Parallel Merge Approach to Across-the-Board Wh-Questions

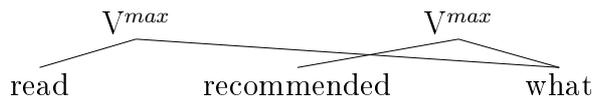
- (4) I wonder what Gretel recommended and Hansel read.
 (5) Step 1: Merge *read* and *what*, project *read*:



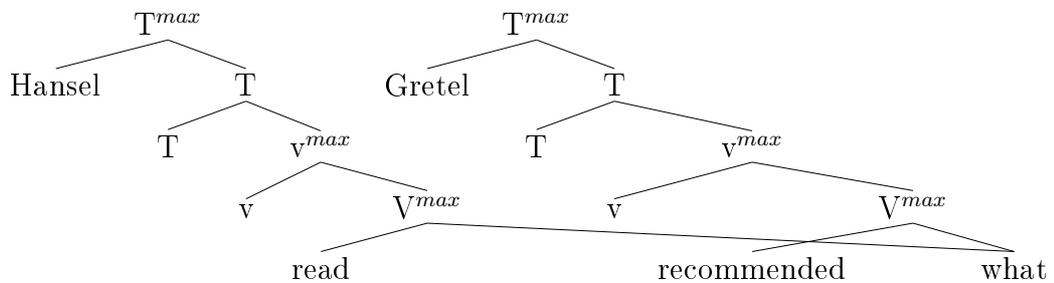
- (6) Step 2: Parallel Merge of *recommended* and *what*, project *recommended*:



- (7) Linear order presentation of Step 2:



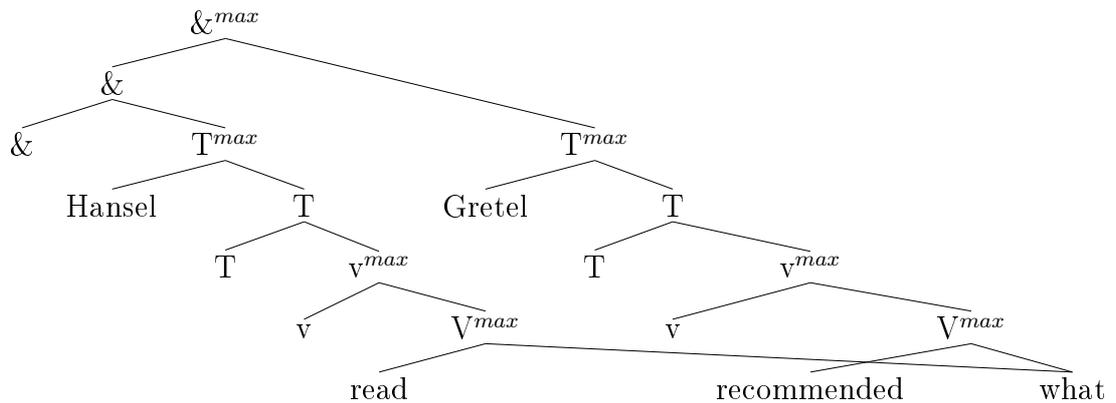
- (8) Step 3: Parallel derivation of the two clauses:



But what about Case checking?

- Citko adopts the probe-goal approach from Chomsky (2000,2001): feature checking is replaced with feature valuation & Case is not a primitive feature but a reflex of ϕ -features on the heads T and v.
- Uninterpretable features enter the derivation unvalued, Agree provides values under appropriate structural conditions.
- The system does not exclude that one goal can agree simultaneously with two or more probes.
- Moreover, nothing prevents a single element from participating in multiple Case valuations, since Case assignment is divorced from movement.

(9) Step 4: Merging the two clauses with the conjunction head:



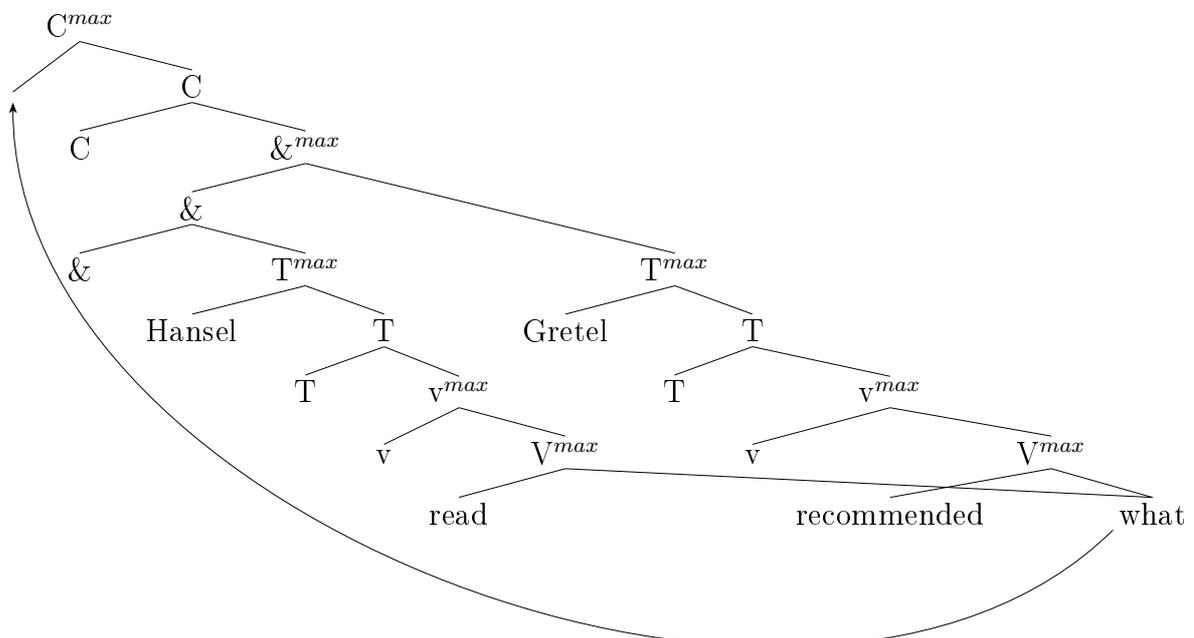
- A standard approach to coordination is chosen: the two conjuncts are in an asymmetric relationship.
- $\&$ heads the relationship, one conjunct is merged as complement, the other as specifier. There is evidence for this structure:
- (i) A quantifier in the first conjunct can bind a variable in the second conjunct, but not vice versa:

- (10) a. *Every professor and his spouse* attended the convocation.
 b. **His spouse and every professor* attended the convocation.

- (ii) The conjunction head forms a constituent with the second conjunct:

- (11) a. John read a book yesterday, and the newspapers.
 b. *John read the newspapers yesterday, the book and.

(12) Step 5: The complementizer projection is constructed:



- The shared element *what* moves from the shared node to SpecC.
- It is assumed that *what* is pronounced in this position. Thus, no problems with the LCA arise, because every item can be unambiguously assigned a position in the linear string.
- Other multidominance approaches fall short on this point, because they do not address linearization at all or stipulate construction specific rules.

4 Consequences of the Parallel Merge Approach to Across-the-Board Wh-Question

4.1 Matching effects

What is it?

- It is the requirement that the fronted wh-pronoun match in case the gaps inside the two conjuncts.
- (13)
- a. Kogo Jan lubi t a Maria podziwia t?
 who.ACC Jan likes t.ACC and Maria admires t.ACC
 ‘Who does Jan like and Maria admire?’
 - b. *Kogo/Komu Jan lubi t a Maria ufa t?
 who.ACC/DAT Jan likes t.ACC and Maria trusts t.DAT
 ‘Who does Jan like and Maria trust?’

How to account for that in the present approach:

- The wh-element is merged with two verbs and it must satisfy whatever category and case restrictions are imposed by them.
- In case of mismatching requirements, one wh-element simply cannot fulfill both of them simultaneously.
- Thus, one requirement remains unsatisfied which gives rise to ungrammaticality.

An exception: Mismatches are possible as long as the appropriate case-forms are syncretic:

- (14)
- a. Kogo Jan nienawidzi t a Maria lubi t?
 Who.ACC/GEN Jan hates t.GEN and Maria likes t.ACC
 ‘Whom does Jan hate and Maria like?’
 - b. *Czego/Co Jan nienawidzi t a Maria lubi t?
 what.ACC/GEN Jan hates t.GEN and Maria likes t.ACC
 ‘What does Jan hate and Maria like?’

- This is a puzzle if we assume that there are distinct wh-pronouns in the lexicon (one for genitive, one for accusative) which happen to sound the same. In that case, ungrammaticality ought to follow.
- Instead, it is assumed that there is only one underspecified form, which is compatible with an accusative as well as a genitive context.

- More concretely: Citko assumes a Distributed Morphology (DM) approach, in which terminal syntactic nodes are nothing but feature bundles (no phonological content) and vocabulary insertion applies post-syntactically.
- So, the shared DP receives the case information $CASE:[acc,gen]$ and since the lexicon has an item available which fits into this context, the derivation is licit.
- So what is responsible for the ungrammaticality of example (14-b) above is not the mismatch in case features itself, but rather that no lexical item can realize both information simultaneously.

4.2 Covert Across-the-Board Movement

The present analysis predicts that covert ATB movement does not exist:

- The overt movement (in narrow syntax) is responsible for Linearization to be applicable at the end of the derivation.
- Covert movement on the other hand only happens at LF and, therefore, has no effect on syntax or PF.
- Consequently, the shared element remains in-situ in syntax and the illicit Parallel Merge structure is still present when the LCA applies. This leads to the crash of the derivation.

This prediction is borne out as the following evidence shows:

- ATB question in wh-in-situ languages: Chinese, Korean and Japanese are widely known as wh-in-situ languages. A Chinese example is given below:

(15) Zhangsan xihuan shenme ren Lisi taoyan shenme ren?
 Zhangsan like which person Lisi hate which person
 ‘Which person does Zhangsan like and which person does Lisi hate?’

- These questions are not ungrammatical but lack the "single-individual reading" typical of ATB questions.
- To make this reading available, overt wh-movement has to take place:

(16) Shenme ren Zhangsan xihuan Lisi taoyan?
 which person Zhangsan like Lisi hate
 ‘Which person does Zhangsan like and Lisi hate?’

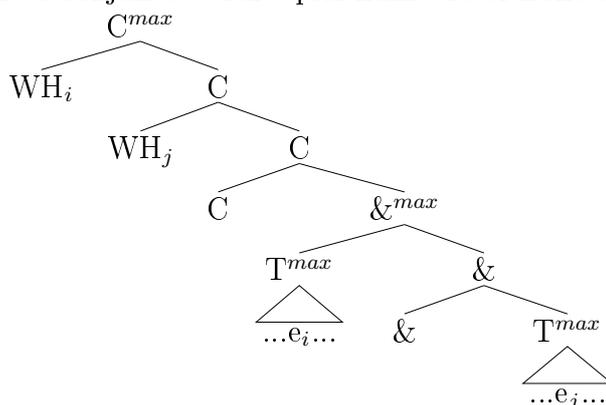
- This is striking since Chinese is widely known to lack overt wh-movement and the fact that it has to resort to exactly that in the ATB context indicates that the covert counterpart is not available.
- The same holds for Korean and Japanese.
- Moreover, ATB quantifier raising also does not seem to exist. Consider the following example, where the existential quantifier cannot take wide scope:

(17) Every philosopher read *some paper* and every linguist reviewed *some paper*.

4.3 Across-the-Board Wh-movement in Languages with Overt Multiple Wh-Fronting

- It can also be shown that a simple parallelism constraint requiring each conjunct in a coordinate structure to contain a gap does not suffice as explanation for this phenomenon.
- If it were the case, a structure like the following would be expected:

(18) Two conjuncts with equal numbers of fronted wh-elements and gaps:



- But sentences with multiple fronted wh-elements in an ATB wh-movement context are ungrammatical.
- In languages like English, a ban on multiple specifiers might be the reason for that (since multiple wh-fronting is included in general).
- But this does not hold for Slavic languages since multiple wh-fronting is in principle allowed but not in an ATB-movement context. Polish illustrates this:

- (19) a. *Kogo_i kogo_j Jan lubi t_i a Maria kocha t_j?
 Whom whom Jan likes t and Maria loves t
 ‘Whom does Jan like and Maria love?’
- b. *Kogo_i komu_j Jan lubi t_i a Maria sie przyglada t_j?
 Who.ACC who.DAT Jan likes t and Maria REFL looks.at t
 ‘Who does Jan like and Maria look at?’

- Under the present approach, this follows straightforwardly: There is only one wh-element to begin with. Thus, only one can be fronted.
- Hence, ATB wh-movement is not special; rather the structure out of which the wh-pronoun moves is special.

4.4 Reconstruction Effects

Prediction under this account: The wh-element of the ATB question reconstructs simultaneously into both conjuncts (due to the shared position). But what are the facts?

- The facts are inconclusive: With some diagnostics both conjuncts seem to be affected, with others an asymmetry occurs.

- (i) Variable binding reconstruction: both conjuncts are affected, since a variable in the fronted wh-pronoun has to be bound by quantifiers in both conjuncts:

- (20) a. Which picture of *his mother* did *every Italian* like and *every Frenchman* dislike?
 b. #?Which picture of *his mother* did *every Italian* like and Mary dislike?
 c. #?Which picture of *his mother* did Mary dislike and *every Italian* like?

- (ii) Idiom interpretation: both conjuncts are affected, since both allow for idiomatic reading:

- (21) a. Which picture did John take and Bill pose for?
 b. Which picture did John pose for and Bill take?

- (ii) Strong crossover effects occur within both conjuncts:

- (22) a. *Whose_{*i*} mother did we talk to and he_{*i*} never visit?
 b. *Whose_{*i*} mother did he_{*i*} never visit and we talk to?

- (iii) How-many-ATB questions: both conjuncts can be affected:

- (23) How many books did every student like and every professor dislike?

This kind of question is multiply ambiguous and can be answered in several ways. But, crucially, it cannot be the case, that *how many books* has wide scope with respect to *every* in the first conjunct and narrow scope with respect to *every* inside the second conjunct ($every_2 > how\ many > every_1$). If it could, the question in (24-a) could be answered with (24-b) which is not the case. (Note: *almost* is inserted because it obligatorily takes narrow scope.)

- (24) a. How many books did every student like and almost every professor dislike?
 b. #Student A liked seven books, and Student B liked three books, and Student C liked nine books, and almost every professor disliked six books.

- (iv) Anaphor binding: asymmetry between the conjuncts

- (25) a. *Which pictures of himself_{*i*} did Mary sell and John_{*i*} buy?
 b. Which picture of himself_{*i*} did John_{*i*} sell and Mary buy?

- (v) Principle C effects: asymmetry

- (26) a. *Which picture of John_{*i*} did he_{*i*} like and Mary dislike?
 b. Which picture of John_{*i*} did Mary like and he_{*i*} dislike?

- (vi) Weak crossover effects: asymmetry
 - (27) a. *Who_i did his_i boss fire and John hire?
 - b. Who_i did John hire and his_i boss fire?
- Citko infers that those diagnostics do not form a unified class and linear precedence might be a factor with some diagnostics.

5 Conclusion

- A new type of Merge combining the properties of internal & external Merge has been argued for - Parallel Merge.
- It creates symmetric structures which become asymmetric in the course of the derivation, which makes linearization possible.
- Parallel Merge was also applied to ATB wh-questions, which accounts for the matching effects, lack of covert movement, and the lack of multiple fronted wh-forms.

6 Questions & Open issues:

- Is the Extension Condition violated by Parallel Merge? If so, what are the consequences?
- Citko's explanation for Case checking was not very profound. What more needs to be said about the details of Case checking?
- Does the analysis proposed here also work for Right Node Raising (RNR)?

(28) John likes and Mary hates magazines.

7 References

Citko, Barbara (2005). On the Nature of Merge: External Merge, Internal Merge, and Parallel Merge. *Linguistic Inquiry* 36(4), p. 475-496. Cambridge, MIT Press.
And references cited therein.