**Syntax Fest 2004**
**The format of dependency relations**
**Bloomington, June 22, 2004**

# Merge

## 0. Prologue

*On three great ideas, and how they fared.*

(1) Linear order is a function of hierarchical structure (LCA, Kayne 1994)

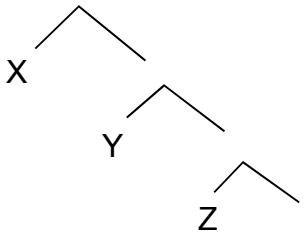
(2) C-command is a function of Merge (Epstein 1995)

(3) Recursive Merge is the defining property of FLN (Hauser, Chomsky, and Fitch 2002; Chomsky 2004).

FLN = Faculty of Language in the Narrow sense, that which all other animals lack

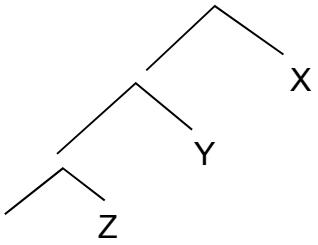
Ad (1)

(4) a.




b. / X Y Z /

c.




d. / X Y Z /

*Evidence: typological gaps*

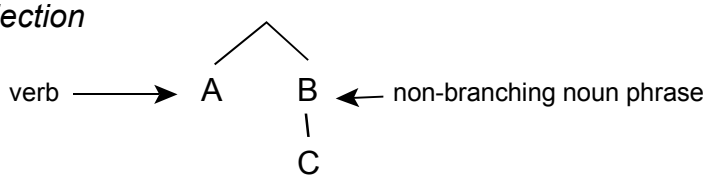
(5) *No V2-but-last*
a. Why **did** you do it ?
b. * I meet yesterday **did** my favorite uncle from Cleveland

(6) *No P-stranding to the right*
a. Ik heb koekjes *voor* *bij de koffie* gekocht
I have cookies for with the coffee bought
b. *Daar* heb ik koekjes *voor* gekocht
there have i cookies for bought
c. * Ik heb koekjes *voor* gekocht *bij de koffie*
I have cookies for bought with the coffee

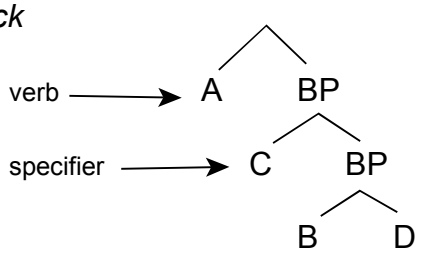
*Technical implementation: asymmetric c-command* (Richards's class)

(7) Problem: needs to capitalize on properties of Phrase Structure which are in violation of Bare Phrase Structure theory (Chomsky 1995).

(7) a. *vacuous projection*




b. *segments trick*




(8) Critique (Chomsky 1995): the typological generalizations are correct, but the way they are derived makes crucial use of aspects of the *notation*.

*In hindsight: the problem with the derivation of the LCA is that it requires a <u>global</u> definition of asymmetric relations (covering the entire structure)*.

(9) Alternative: (i) Local definition: if α merges with β, α is spelled out before β
(ii) β stands for 'the terms of β'

See below for 'merger with'.

<u>Ad 2</u>

(10) *The derivational approach to syntactic relations*
Grammatical relations involving α, β are defined at the point in the derivation where α and β are merged

(11) *Traditional definition of c-command*
α c-commands β iff every γ that dominates α also dominates β

*No argument about the correctness of (11): binding, NPI-licensing, antecedent-trace relations, etc. But why are the facts the way they are?*

(12) *Representational (global) approach*
Every set of nodes making up a structure which contains α is divided in a subset c-commanded by α and its complement (the subset not c-commanded by α).

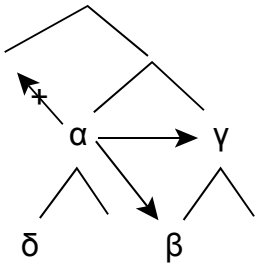
*Could the partition have been different?*

(13) *Local (derivational) definition*
α c-commands β iff α is merged with (γ dominating) β

*The subset of nodes c-commanded by α is the total set of nodes in existence at the moment when α is merged to the structure*.

(14) Critique (Brody): then α's sister must c-command the terms of α

(15)

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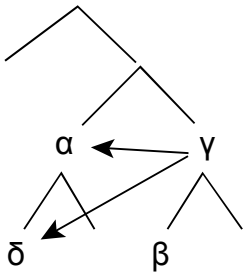



*But no phenomena exist to suggest such counterlinear c-command relations*.

Note that the argument assumes some version of the LCA

*In hindsight, Brody's problem disappears if merge is asymmetric (i.e. if α is merged to β, β is not merged to α).*

Ad 3

(17) FLN is characterized by the ability to recursively apply the operation Merge.

(18) This the only aspect of cognition relevant to language that we can be reasonably certain that other animals lack it.

Possibly, recursion is present in other animals, but just not applied to communication.

(19) Critique (Pinker and Jackendoff 2003): there is much more to language than recursion.

(20) *Summary of what is missing (syntax only)*
a. questions of order
b. agreement
c. case
d. various other dependencies (binding, etc.)

*Question: if other animals were (by some evolutionary leap) to suddenly master recursion (or to apply recursion to communication), would they then develop agreement, or would that require another evolutionary step?*

(21) *Quick answers to (20)*
a. merge maps into linear order
b. case/agreement flag dependencies created by merge
c. dependencies are a function of merge

## 1. Basic assumptions throughout the course

(22) a. Structure is built from the bottom-up
b. The only structure building device is merge, applied iteratively
c. Structure is invariably binary branching
d. Grammatical relations are defined derivationally (i.e. in tandem with merge)
e. Grammatical relations of any kind exist only between sisters

(23) *As opposed to*
a. top-down structure building (Phillips 2003, Richards 1999)
b. merge *and* move
c. n-ary branching, multidimensional structure
d. global definition, or definition per phase
e. relations between α and a term of α's sister

*We put aside questions relating to multiple spell-out and parallel derivation (of syntax with sound/meaning).*

(24) Elements acquire features in the course of the derivation and take them along to the interfaces (implies: morphology after syntax).

## 2. Chomsky on merge

(25) "the language faculty is [...] a system of discrete infinity. Any such system is based on a primitive operation that takes *n* objects already constructed, and constructs from them a new object: in the simplest case, the set of *n* objects." (2004:10)

(26) "Merge takes two elements and creates a new one." (2001:4)

(27) "the simplest possible [operation is] unstructured merge" (2004:13)

*So Merge of α and β yields a set {α,β}*.

(28) *Caveats*
a. adjunction yields an ordered pair
b. there is a "label": one of α,β counts as the "head"
c. if β is complex, {α,β} is equivalent to <α,β>

(29) *The extension condition*
"minimizing computational load, merge of A will leave A intact" (2004:11)

(30) *Ordered pairs are not "primitive objects for mental computation"*
a. simplicity argument (set merge is simpler, more basic)
b. asymmetries can be independently derived (need not be marked on the product of merge)

## 3. Asymmetric merge

(31) Main point: Merge yields a set of elements that are not equivalent.

(32) Simplest notation: ordered pair <α,β>

(33) <α,β> is interpreted as follows

a. β is the dependent of α
b. /α β/ (LCA)
c. β is stressed w.r.t. α (Nuclear Stress Rule)
d. β is marked for dependency (generalized dependent-marking)

## 4. The simplicity argument

(34) *Merge: breakdown in steps*
(i) select α ∈ N
(ii) select β ∈ N
(iii) Merge α and β

(35) *Sample derivation* (from Collins 2002:47)

N = { John, will, see, Mary }

(a) select *see* ∈ N
(b) select *Mary* ∈ N
(c) Merge *see* and *Mary*
(d) select *will* ∈ N
(e) Merge *will* and { *see, Mary* }
(f) select *John* ∈ N
(g) Merge *John* and { *will,* { *see, Mary* }}

(36) *Alternatively*

(a) select *see* ∈ N
(b) select *Mary* ∈ N
(c) Merge *see* and *Mary* (yielding { *see, Mary* })
(d) select *will* ∈ N
(e) select { *see, Mary* }
(f) Merge *will* and { *see, Mary* } (yielding { *will,* { *see, Mary* }})
etc.

*Could it be simplified?*

(37) *Merge requires minimally*
a. a set of elements to be merged ('numeration') = RESOURCE
b. a current derivation = WORK SPACE
c. a transfer operation from the resource to the work space

(38) *Sample derivation revised*

(a) select *Mary* from the resource
(b) transfer *Mary* to the work space (yielding {*Mary*})
(c) select *see* from the resource
(d) transfer *see* to the work space (yielding {*see, Mary*})
etc.

(39) a. first Merge is merger with nothing
b. after that, Merge yields a set of non-equivalent members (=ordered pair)

One member was already in the work space, the other is newly added to it

(40) *Results*
a. unary operation
b. derives binary branching
c. derives extension condition

(41) *Collins (1997:78-81) on 'merger with nothing'*
a. nothing = { }, excluded because { } could not be the result of Merge
b. nothing = [nothing], excluded because unary merger, being more economical, would always block binary merger

*Leads to a stipulation that Merge has to be binary (to overcome the economy problem).*

(42) Merge is always unary: it takes just one element from the resource and adds it to the work space

(43) Unary transfer yields binary branching without further stipulation

(44) The extension condition follows if transfer of α to β yields a set, with β = the existing derivation at the point of transfer (i.e. no recourse to "minimizing computational load" needed)

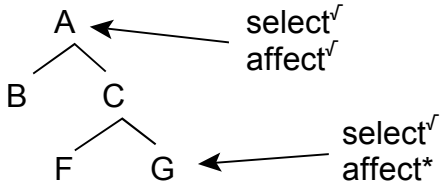
## 5. Some more on movement/internal merge

(45) *Two sides to the extension condition*
a. Output side: merge targets the maximal expansion of the current derivation
b. Input side: select may target any term of the current derivation

(46) Move = internal merge

*Extension condition violated by select, not by merge ('affect')*.

(47)



(48) *Problem solved if resource contains*
a. the numeration
b. parallel derivations
c. backups of all stages of the derivation

| RESOURCE | | |
|---|---|---|
| numeration | parallel derivation | backup |
| *drained by transfer* | *drained by transfer* | *filled after transfer* |
| *contains terms* | *contains phrases* | *contains terms/phrases* |

(49) Internal merge = transfer of backup (move = merge)

*Derives the copy theory of movement*.

(50) Question: which copy is spelled out?

*Should fall out from a theory of dependency*.

(51) Locality (subjacency): follows if the backups have an 'expiration date'

(52) Who did you say [ <who> that Bill kissed <who> ]

(53) * Who did you wonder [ why Bill kissed <who> ]

*Backups last till the end of a phase*.

## 6. Back to the Chomsky's arguments on asymmetric merge

(54) 1. simplicity argument
2. asymmetries may be independently derived

*But if the asymmetry follows from the operation merge (transfer), it is inherent (unavoidable), and the 'independent' derivation of asymmetries becomes redundant.*

(55) *Example*

a. Nuclear Stress Rule: stress goes on the complement
b. If this is a principle, it informs the status of the elements merged, so the asymmetry between the elements merged need not be indicated up front
c. But now, since the asymmetry comes for free, we may question the NSR *as a principle*
d. Potentially, the NSR is a function of merge (session 2).

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