

Asymmetric Merge

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0. Background: the derivational approach to syntactic relations

- (1) *"We hypothesize that FLN [the faculty of language in the narrow sense, i.e. the computational system of human language, or narrow syntax] includes recursion and is the only uniquely human component of the faculty of language."*

Hauser, Chomsky, and Fitch (2002:1569)

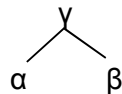
- (2) *"Narrow syntax has one operation that comes 'free', in that it is required in some form for any recursive system: the operation Merge. (...) Any operation other than Merge requires empirical motivation, and is a derivation from SMT [the strong minimalist thesis]."*

Chomsky (2001:4)

- (3) *"...syntactic relations are established between a syntactic category X and a syntactic category Y when (and only when) X and Y are transformationally concatenated (thereby entering into sister relations with each other) by (...) Merge (...) during the tree-building, iterative, universal rule application that constitutes the derivation."*

Epstein (1999:320)

- (4) a. merge yields



- b. γ may function as α/β (recursion)

- d. the derivation comprises temporally ordered series of steps

- e. grammatical relations are a function of merge

i. format = sisterhood

ii. determination takes place at different moments in time during a derivation

1. Asymmetry in language

- (5) *asymmetry is inevitable*
a. linear (temporal) order
b. information (dependency)

- (6) *asymmetry is not random*
a. hierarchy = precedence (Kayne 1994)
b. coordination
i. A + B
ii. * A B +
c. c-command

- (7) DASR: derive asymmetry from the history of the derivation
- (8) Hypothesis: merge *creates* asymmetry

2. Symmetric vs. asymmetric merge

- (9) *Chomsky (2001, 2004)*
 - a. "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)
 - b. "Merge takes two elements and creates a new one." (2001:4)
 - c. "the simplest possible [operation is] unstructured merge" (2004:13)

(10) $\{ \alpha, \{ \alpha, \beta \} \}$

(11) Alternative: merge yields an ordered pair $\langle \alpha, \beta \rangle$

(13) *Arguments for set-merge*

- i. simplicity
- ii. projection
- iii. inclusiveness

(14) Why *binary* merge (rather than *unary* merge) ?

(15) *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

(16) NUMERATION	MERGE	DERIVATION	SPELL-OUT
<i>John, will, see, Mary</i>	Mary	$\langle \text{Mary}, \emptyset \rangle$	[Mary]
<i>John, will, see</i>	see	$\langle \text{see}, \langle \text{Mary}, \emptyset \rangle \rangle$	[see Mary]
<i>John, will</i>	will	$\langle \text{will}, \langle \text{see}, \langle \text{Mary}, \emptyset \rangle \rangle \rangle$	[will see Mary]
<i>John</i>	John	$\langle \text{John}, \langle \text{will}, \langle \text{see}, \langle \text{Mary}, \emptyset \rangle \rangle \rangle \rangle$	[John will see Mary]

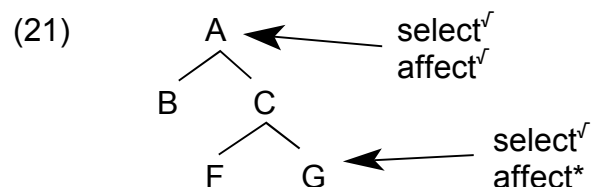
(17) *derives (without stipulation)*

- a. the extension condition
- b. binary branching
- c. asymmetry

(18) strong hypothesis: move = transfer as well

- (19) resource contains minimally
 - a. numeration
 - b. parallel derivations
 and possibly
 - c. backups of merged material

(20) Extension condition: you may select something from inside a derivation, but not merge to (affect) something inside a derivation



- (22) If move = merge (transfer), the extension condition follows if only the entire current derivation can be affected (= DASR).

3. Some interpretive effects of merge

- (23) Sound: linear order (precedence), Nuclear Stress Rule

- (24) Morphology: agreement

- (25) Syntax: case, verb-second, linkers

- (26) Meaning: predication, modification, complementation

In each case, the dependent element is the second member of the ordered pair.

- (27) Asymmetry is temporal: merge turns the current derivation into a dependent

4. The typological dimension

4.1 Head marking vs. dependent marking (Nichols 1986, 1992)

CONSTRUCTION	HEAD	DEPENDENT
<i>possessive</i>	possessum	possessor
<i>attributive</i>	noun	adjective
<i>adpositional</i>	adposition	complement
<i>clausal</i>	verb	arguments

TABLE 1

- (28) *possessive*
- | | | | |
|----|--|-----------------------------------|-----------|
| a. | DEPENDENT
az ember
the man
'the man's house' | HEAD
haz-a
house-3SG | Hungarian |
| b. | the man's | house | English |
- (29) *attributive*
- | | | | |
|----|---|-------------------------------------|---------|
| a. | DEPENDENT
wist
high
'tall house' | HEAD
t-citx°
REL-house | Shuswap |
| b. | zelen-yj
green-NOM.MASC.SG
'green house' | dom
house _{MASC} | Russian |

- (30) *adpositional*
- | | HEAD | DEPENDENT | |
|----|---------------------------------------|------------------------------|-----------|
| a. | bez
without | brat-a
brother-GEN | Russian |
| b. | r-umaal
3SG-by
'by Yaax' | aa Yaax
CL Yaax | Tz'utujil |

- (31) *clausal*
- | |DEPENDENTS..... | | | HEAD | |
|----|---------------------------|----------------------------------|-----------------------------|--|--|
| a. | a-xàc'a
the-man | a-ph°ès
the-woman | a-š°q'è
the-book | ø-l è-y-te-yt'
it-to.her-he-gave-FIN | Abkhaz
'The man gave the woman the book.' |
| b. | boku-ga
1SG-NOM | tomodati-ni
friend-DAT | hana-o
flower-OBJ | ageta
gave | Japanese
'I gave my friend flowers.' |

(32) *Phrase structural definition of dependency (Nichols 1986:57)*

- a head determines the presence and properties of other material within the phrase (selection)
- a head determines the features of the phrase as a whole (projection)

4.2 The expression of dependency

- (33) Dependency is which must be can be and
- | | | | |
|----|----------------------------------|------|---------------------|
| a. | a <i>semantic</i> relation | e.g. | predication |
| b. | <i>syntactically</i> realized, | | in phrase structure |
| c. | <i>morphologically</i> marked, | | by agreement |
| d. | <i>phonologically</i> expressed. | | via cliticization |

- (34) The relations (((SEM → SYN) → MORPH) → PHON) need not be homomorphic.

I SEM → SYN

- (35) a. *subject* *predicate*
- | | | | | |
|--------------------|------------------|------|-----------|-------|
| Jij | eet vlees | [NP] | [VP] | Dutch |
| you | eat meat | | | |
| b. Eet jij | vlees ? | [V] | [NP] [NP] | |
| 'Do you eat meat?' | | | | |

II ((SEM → SYN) → MORPH)

- (36)
- | | <i>verb</i> | <i>complement.....</i> | |
|--------------------------------------|-------------|------------------------|--------|
| Ich liebe mein-en Gartenzwerg | | | German |
| I love:1SG my-ACC.SG garden-gnome | | | |
| 'I love my garden gnome.' | | | |

(37) *incomplete dependency marking (standard)*

A dependency relation between α and β may be marked on γ , a term of β

(38) *dependent head-marking*

A dependency relation between α and β may be marked on γ , the head of β

(39) A marking on a head does not signify head marking

III (((SEM → SYN) → MORPH) → PHON)

- (40) *head* *dependent*
nəp'idi-da **gənanəm** **xa** **guk^w** **sa** **t'isəm** Kwakwala
 throw-DEIC child OBJ house OBL rock
 'The child hit the house with a rock (by throwing).'

- (41) *phonological expression on an outsider (the subject)*
 nəp'idi-da **gənanəm=xa** gukw sa t'isəm

- (42) *head dependent*
 a cup of coffee > a cup=of [cuppə] coffee

- (43) cliticization onto a head does not signify head marking

4.3 The nature of subject-verb agreement

- (44) *semantic relation* predication
syntactic realization NP, XP
morphological marking head of XP (unmarked case)

- (45) *other morphological markings*

- a. *multiple marking*
Juma a-li-kuwa a-ngali a-ki-fanya kazi Swahili
 Juma_i 1-PAST-be 1-still 1-PROG-do work
 'Juma was still working.'

- b. *agreement on object*
 i. **Dios tupo'-n naxo-xt'e'wal wako'** Coahuilteco
 god DEM-1AGRS 1PL:SU-annoy CAUS
 'We annoyed god.'
 ii. **Dios tupo'-m xa-ka'wa xo e ?**
 god DEM-2AGRS 2SU-love AUX Q
 'Do you love god?'

- (46)

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graph TD
    Root[ ] --- Subject[subject]
    Root --- Predicate[predicate]
    Predicate --- Aux[auxiliary, verb, object, etc.]
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- (47) Relation not between *head-dependent* but between *dependent-nondependent*

- (48) Subject-verb agreement is an instantiation of *dependent head-marking* (38).

- (49) *Other considerations*

- a. Consistent dependent-marking languages commonly show subject-verb agreement
 b. The subject is not directly related to the verb (arguments are—a subject can be any type of argument and even a nonargument)

(50) Question: how much *nondependent-marking* is there in the languages of the world?

4.4 Review of Nichols' (1986, 1992) observations

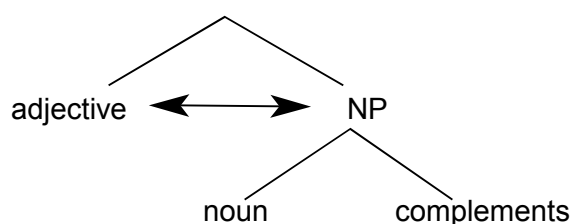
4.4.1 Possessive constructions

- (51) CONSTRUCTION SEMANTIC RELATION
- a. **Jan's boek** subject-predicate Dutch
John-POSS book
- b. **het boek van Jan** head-complement
the book of John
- (52) NONDEPENDENT DEPENDENT MARKING
- a. **az ember haz-a** dependent Hungarian
the man house-3SG
'the man's house'
- b. **the man's house** nondependent? English
c. **het boek van Jan** dependent Dutch
the book of John
- (53) the man his house (cf. Dutch *de man z'n [<zijn] huis*)
the man= ='s house
- (54) *the izafet construction: dependent marking + cliticization*
- a. NONDEPENDENT DEPENDENT MARKING
asb= =é mard dependent Persian
horse EZ man
'the horse of the man'
- b. i. **ki-tabu ch-a Juma** dependent Swahili
7-book 7-EZ Juma
'the book of Juma'
- ii. **vi-tabu vy-a Juma**
8-book 8-EZ Juma
'the books of Juma'
- (55) *genitive case: unclear*
- a. NONDEPENDENT DEPENDENT MARKING
kniga Ivan-a dependent? Russian
book Ivan-GEN
'John's book'
- b. **Ahmeda-n wan** nondependent? Lezgian
Ahmed-GEN voice
'Ahmed's voice'

4.4.2 Attributive constructions

(56) the [new [students of linguistics]]

(57)



- (58)
- | | | | | |
|----|---|-------------------------------------|----------------------|---------|
| | NONDEPENDENT | DEPENDENT | MARKING | |
| a. | zelen-yj
green-NOM.MASC.SG
'green house' | dom
house _{MASC} | <i>nondependent?</i> | Russian |
| b. | wist
high
'tall house' | t-citx°
REL-house | <i>dependent</i> | Shuswap |

- (59)
- | | | | | |
|----|------------------------|------------------------------|--|---------------|
| a. | calay
funny | a-monit
REL-person | | Karbi (Mikir) |
| b. | monit
person | calay
funny | | |

- (60)
- | | | | | |
|----|--|--|--|-------|
| a. | het
the:NTR.SG.DEF
'the book' | boek-ø
book _{NTR-SG} | | Dutch |
| b. | de
the:PL.DEF
'the books' | boek-en
book _{NTR-PL} | | |

- (61)
- | | | | |
|--|--|---|--|
| | NONDEPENDENT | DEPENDENTS..... | |
| | de
the:PL.DEF
'the old books' | oud-e boek-en
old-PL book _{NTR-PL} | |

- (62) Case and number are not inherent features of N, so dependent marking. Gender...?

- (63) *the izafet construction*
- | | | | | |
|----|--|----------------------------------|------------------|---------|
| | NONDEPENDENT | DEPENDENT | MARKING | |
| a. | küh=
mountain
'high mountain' | =e boländ
EZ high | <i>dependent</i> | Persian |
| b. | ki-ti
7-chair
'wooden chair' | ch-a m-ti
7-REL 3-wood | <i>dependent</i> | Swahili |

4.4.3 Adposition constructions

- (64)
- | | | | | |
|----|---------------------------------------|------------------------------|----------------------|-----------|
| | NONDEPENDENT | DEPENDENT | MARKING | |
| a. | bez
without | brat-a
brother-GEN | <i>dependent</i> | Russian |
| b. | r-umaal
3SG-by
'by Yaax' | aa Yaax
CL Yaax | <i>nondependent?</i> | Tz'utujil |

- (65) 'head marking' adpositions are 'relational nouns' (Nichols 1992:58), marked by possessor agreement

- (66)
- | | | | | |
|----|--|----------------------------|--------------------|------------|
| | NONDEPENDENT | DEPENDENT | MARKING | |
| a. | ja
1SG:OBL
'with me, beside me' | a-płči
1SG-side | <i>dependent</i> | Burushaski |
| b. | Lɔŋa Brumo
L.B.:NOM | mo-płči
3SG-side | 'with Langa Brumo' | |

- (67) Tz'utujil: a. noun raising ?
b. dependent precedes nondependent ?

(68) *spurious cases of head-marked adpositions*

- a. i. **i'-ma** ii. **te'-ma** iii. **po'le-ma** Wappo
1SG-for 3SG-for boy-for
'for me' 'for him' 'for the boy'
- b. i. **'ab** **t-wui** ii. **'am** **'em-wui** Papago
TOWARD 1PL-to AWAY 2PL-to
'toward us' 'toward you'
- c. i. **Waraka hyaye k-omok-no** Hixkaryana
Waraka from 1SG-come-IMM.PAST
'I have come from Waraka.'
- ii. **i-hyaye k-omok-no**
3SG-from 1SG-come-IMM.PAST
'I have come from him.'

4.5 Dependency revisited

(69) *The core dependency relations*

- a. head-complement: the complement is the dependent of the head
b. subject-predicate: the predicate is the dependent of the subject

	SUBJECT/HEAD	PREDICATE/COMPLEMENT
<i>prosody</i>	weak ($\sqrt{\text{subject}}/\sqrt{\text{head}}$)	strong ($\sqrt{\text{predicate}}/\sqrt{\text{complement}}$)
<i>order</i>	'left' ($\sqrt{\text{subject}}/?\text{head}$)	'right' ($\sqrt{\text{predicate}}/?\text{complement}$)
<i>merge</i>	new ($\sqrt{\text{subject}}/?\text{head}$)	old ($\sqrt{\text{predicate}}/?\text{complement}$)
<i>dependency</i>	nondependent ($? \text{subject}/\sqrt{\text{head}}$)	dependent ($? \text{predicate}/\sqrt{\text{complement}}$)

TABLE 2

6. Conclusion

1. Dependencies are relations between sisters
2. Participants are *dependents* and *nondependents*
3. Agreement is always *dependent marking*
4. Clear examples of nondependent marking are few

References

Chomsky, 1995. *The minimalist program*. ! 2001. Derivation by phase ! 2004. Three factors in language design ! Epstein, 1995/1999. Un-principled syntax and the derivation of syntactic relations ! Hauser.Chomsky/Fitch 2002.The Faculty of Language: What is it, who has it, and how did it evolve? *Science* 298, 1569-1579. ! Nichols 1986 Head-marking and dependent-marking grammar. *Lg* 62, 56-119. ! 1992 *Linguistic diversity in space and time*. Chicago: University of Chicago Press. ! Kayne, 1994. *The antisymmetry of syntax*.

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