Foundations of Dependency in Universal Grammar

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1. The program

(1) NWO funded Programmatic Research in the Humanities *Dependency in Universal Grammar* (2006-2010)
- www.nwo.nl/projecten.nsf/pages/2300130941
- www.let.rug.nl/~zwart/diug/uitwerkingpdf.pdf

(2) 3 projects (2 promovendi, 1 postdoc)

(3) Hypothesis:
Merge (structure building operation of the Faculty of Language) generates an asymmetric sister pair consisting of a dependent and a nondependent

(4) a. Universal: the operation merge and the dependent-nondependent partition
b. Variation: the morphological expression of dependency on the dependent

(5) Projects:
1. morphosyntactic dependency in the clause
2. morphosyntactic dependency in the noun phrase
3. fundamental properties of pairs created by Merge

2. Dependency

(6) Core case:
δ is a dependent of α if δ expresses in its morphology a feature of α

(7) vogel-s   vlieg-en   (Dutch)
bird-PL   fly-PL
inherent   dependent

(8) Morphology is a diagnostics of dependency, but is not itself dependency

(9) Underlying the morphological realization is a **relation** of dependency between the subject (*vogels*) and the predicate (*vliegen*).

(10)   Other diagnostics:
- prosody   a. vogels VLIEgen
- semantic interpretation   b. *vliegen* = predicate VP, not entity DP
- word order?   c. nondependent > dependent

(11)   What is the nature of the dependency **relation** ?

(12)   Hypothesis: when *x* merges to *y*, *y* becomes the dependent of *x*

(13)   ≡   ⟨x, y⟩
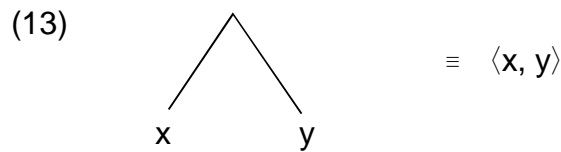
(14)   Merge: a bottom up structure building procedure recursively combining two elements into a constituent C

(15)   C is an ordered pair

[ASIDE: traditional notion of dependency:

   (i)   δ is a dependent of α if α is a head and δ is a non-head within αP

   (ii)   dependency in these terms is not unique, binary, and local

   (iii)   head- vs. dependent-marking based on this notion of dependency]

3. Merge

(16)   "(...) the most elementary property of language (...) is that it is a system of descrete infinity consisting of hierarchically organized objects. Any such system is based on an operation that takes *n* syntactic objects (SO) already formed, and constructs from them a new SO. Call the operation *Merge*." (Chomsky 2005:4)

(17)   "A natural requirement for efficient computation is a "no tampering condition" NTC: Merge of X and Y leaves the two SOs unchanged. If so, then Merge can be taken to yield the set {X,Y}, the simplest possibility worth considering." (Chomsky 2005:5)

(18)   "A more complex alternative, consistent with NTC, is that Merge forms the pair ⟨X, Y⟩. The underlying issue is whether linear order plays a role in narrow syntax (...) or whether it is restricted to the phonological component (...)." (ibid.)

(19)   Linear Correspondence Axiom (LCA)(Kayne 1994)
Linear order is a function of structural asymmetry (my formulation)

(20)   a. ordered pair does not entail linear ordering (just a structural notion)
b. spoken modality requires linear ordering
c. LCA: linear order is a function of the asymmetry between members of an ordered pair

(21)   What is the simplest form Merge could take?

(22)   You need: a. a set of objects already created (morphemes, words, phrases): the Numeration
b. an operation constructing a new object (Merge)

(23)   Bobaljik (1995): Merge is an assignment operation, adding to the Numeration the information that two of its members form a bond

        Numeration: a, b, c
        Merge a + b
        Numeration: a, b, c, a+b

(24)   a+b is a part of the Numeration that 'grows' (hence the Workspace)

(25)   Simplest form: assign one element at a time

(26)   Numeration: a, b, c, workspace = 0
        Merge a
        Numeration: a, b, c, workspace = a
        Merge b
        Numeration: a, b, c, workspace = a, b+a
        Merge c
        Numeration: a, b, c, workspace = a, b+a, c+[b+a]
        etc

(27)   Movement: 'remerging' an element already in the workspace

        Numeration: a, b, c, workspace = a, b+a, c+[b+a]
        Merge a
        Numeration: a, b, c, workspace = a, b+a, c+[b+a], a+[c+[b+a]]

(28)   Condition on movement: merge elements from the workspace only

        Numeration: a, b, c, d = [e+f]
        Merge d
        *Merge e

(29)   Specifiers are always in the numeration as phrases [a+b], no extraction out of subjects/specifiers/adjuncts (Condition on Extraction Domains)

(30)   a. *   It's the CAR that [the driver of —] caused a scandal (merged as specifier)
        b.   It's the CAR that [the driver of —] was arrested   (merged as complement)
        (Chomsky 2005:13)

(31)   Merge yields an ordered pair: asymmetry based on history of the derivation (in (26), *a* is already in the workspace, *b* is new to it) (Jaspers 1998)

(32)   Linear Correspondence Axiom
        $\langle X, Y \rangle = / X\ Y /$

4. Order as an indicator of dependency

(33)   Convergence of dependency diagnostics? (cf. (8)/(10))

(34) a. Vogels *vliegen* (morphology; prosody; order; semantics)
         birds   fly

      b. *Vliegen* vogels ? (morphology; semantics)

(35) a. ouvre *bouteille* (prosody; order; semantics)   (French)
         open   bottle   'cork screw'

      b. *kurk*-e-trekker (prosody; semantics)   (Dutch)
         cork-LINK-drawer 'cork screw'

(36) a. berg *Horeb*   (prosody; order; semantics)   (Dutch)
         mount Horeb

      b. *Atlas*-gebergte   (prosody, semantics)
         Atlas-range

(37) Order is the least reliable of dependency diagnostics

(38) VO-languages vs. OV-languages (fifty-fifty distribution)

(39) Hypothesis: order converges with other indicators when we are certain that no
      movement has occurred.

(40) a. juxtapositions
      b. coordinations

(41) Prosodic pattern in juxtapositions
a.   sports result   1-1   één-ÉÉN
b.   digit sequence   1, 2, 3 één-twee-DRIE
c.   numbers   21   een-en-TWINtig   [one and twenty]
d.   the time   1:30   half TWEE   [half two]
e.   the amount   2,50   twee-VIJFtig
f.   reduplication   zozo   zo-zO   'so-so'
g.   titles   luitenant-koloNEL   'wing commander'
h.   acronyms   PvdA   pévédéA   [socialist party]
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i.   coordinations   john and MAry
j.   asyndetics   me TARzan
k.   construct state   huis USHer   [house (of) Usher]
l.   predications   john loves MAry

(42) Nuclear Stress Rule (Chomsky & Halle 1968)
      Pitch accent on complement (cf. Cinque 1993, Zubizarreta 1998)

5. Coordination

(43) Strategies   a. juxtaposition   b. summary strategy
                    c. comitative strategy d. true coordination

(44)   Summary strategy
   ● coordinands listed
   ● resumed by summary element (pronoun, *also*, *all*, *copula*, dual marker, etc.)

(45)   Péédoro-o,   Jóáa-á,   Perípe-é,   **éhdume**   péé   téhullévu   (Bora)
       Pedro-RED   Juan-RED Felipe-RED   this quantity   go   away
       'Pedro, Juan, and Felipe went away.' (Thiesen 1996:75)

(46)   Coordination strategy: *with*

(47)   Péédoró-mútsi-kye   Jóáá-**ma**   ájtyúmɨ́ɨ́be   (Bora)
       Pedro-DU-ACC   Juan-with   see:1SG
       'I see Pedro and Juan.' (Thiesen 1996:75)

(48)   Conjunction position (noun phrase conjunction; 214 language sample)

INITIAL			FINAL			MIXED				OTHER		
135			**12**			**26**				**39**		
h-in	split	h-fin	h-in	split	h-fin	in fin	in poly	poly fin	3 way	poly	no data	tbd
85	**3**	**47**	**0**	**2**	**10**	**11**	**10**	**2**	**3**	**16**	**18**	**5**

(49)   Languages using final conjunctions exclusively

LANGUAGE	SUMMARY	COMITATIVE	TRUE
35:3 Slave	X	X	
56:2 Yaqui	(X?)	X	
58:1 Ika		X	
64:1 N Junin Quechua		X	
65:1 Jaqaru		X	
71:1 Yagua	X		
72:1 Bora	X	X	
75:1 Sanumá	X		
76:1 Barasano	X		
76:2 Retuarã	X		
82:1 Paumarí	X		
86:1 Trío	X		

(50)   Languages using final conjunctions in mixed group

LANGUAGE	SUMMARY	COMITATIVE	TRUE
3:1 Logbara	X	X	(X?)
7:6 Kalasha-ala	X		X*
10:1 Kolyma Yukaghir		X	
12:1 Ket		X	
15:2 Kham	X		
19:21 Baram Kayan	X		
33:4 W Desert Lg	X	X	
33:5 Kayardild	X		
35:2 Navaho		X	
46:1 Hualapai	X	(X)	
56:1 Shoshone		X	
64:2 Imbabura Quichua	X		
73:1 Pirahã	X		
83:1 Tariano		X	
85:1 Wari'	X		
94:1 Kwaza			X*
* also used as initial conjunction			

(51)   à   mu   ɛ̀ri pie   àkú-a   (Logbara)
        we   go   he and   home-to
        'I and he go home.' (Crazzolara 1960:100)

(52)   a. e meši   ye   e   muša   (Kalasha-ala)
           a woman   and   a   man
           'a woman and a man' (Degener 1998:166)

        b. meši   moša ye   (meši-moša-y)
           women   men and
           'man and woman' (ibid.)

(53)   si xyi-a-'ta   oja-'nã-a-ki   Ba'hozo-nã   (Kwaza)
        I you-1PL-CSO go-FUT-1PL-DEC Barroso-LOC
        'I and you we are going to Barroso.' (CSO = cosubordinator)
   [lit: me, you, we being, we go to Barroso] (Van der Voort 2004:707)

(54)   True conjunctions are initial to the second member

(55)   Common pattern (20 languages): comitative postposition turned into initial
        conjunction (Zwart 2005)

(56) a. əṅ rəṅ doː chaṅ due (Kinnauri)
        1SG:GEN with 3SG:GEN son be:3PAST
        'His son was with me.' (Sharma 1988:91)

    b. gə rəṅ ki bi-tič
        1SG:DIR and you:HON go-FUT:1DU.INCL.HON
        'I and you will go.' (Sharma 1988:182)

(57) Conclusion
a. Even parallel coordinations are asymmetric
b. The asymmetry is marked on the second member
c. The marker is a left edge element (a linker)

(58) Convergence of order and morphology (and prosody and semantics)

6. Dependency realization: agreement

(59) Subject-predicate relation: predicate is dependent (order, prosody, semantics, morphology)

(60) Additional argument: subject extracted from predicate (e.g. passive), so predicate must be constructed before subject is merged

(61) Agreement must be a relation between the subject and its sister (Zwart 2006)

(62) Subject agreement may be realized on a range of predicate-internal elements:

a. *adjacent verb/auxiliary*
    Jan wandel-**t** in het bos (Dutch)
    John walk-3SG in the forest
    'John is walking in the forest.'

b. *nonadjacent verb/auxiliary*
    John rarely walk-**s** in the forest (English)

    ..dat Jan in het bos wandel-**t**
    that John in the forest walk-3SG (Dutch)
    '..that John is walking in the forest.'

c. *multiple predicate-internal elements*
    Juma **a**-li-kuwa **a**-ngali **a**-ki-fanya kazi (Swahili)
    Juma$_1$ SU$_1$-PAST-be SU$_1$-still SU$_1$-PROG-do work
    'Juma was still working.' (Carstens 2003: 395))

d. *adjacent pronouns/clitics*
    u bru laʔ pən-yəp **u** u psñ (Bhoi Khasi)
    3SG.MASC man PAST cause-die he 3SG.MASC snake
    'The man killed a snake.' (Nagaraja 1997)

e. *nonadjacent pronouns/clitics*

u	bru	pīnyap	psəñ	**u**	(Nongtung Khasi)
3SG.MASC	man	cause-die	snake	he	

'The man killed a snake.' (Nagaraja 1997:355)

f. *objects*

na-pa-xaˑm	a-p-saˑ	apaˑ-**m**	uxʷaˑl'	tukweˑ-**m**	xaˑ-pa-čuˑ	san
1SG-soul		DEM-2AGRS	sky	DEM-2AGRS	2SU-SUB-carry	FUT

'(that) you will carry my soul to heaven' (Troike 1981: 663)　　　(Coahuilteco)

(63)
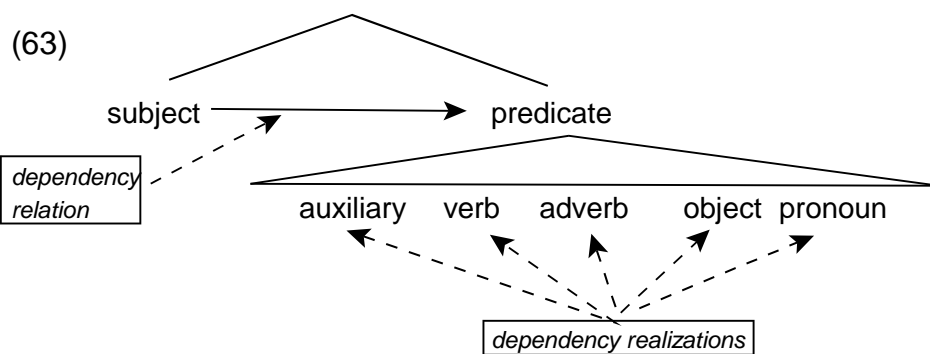
(64) Similarly with the expression of reflexivity

a. *object*

John saw **himself**　　　　　　　　　　　　　　　　　(English)

en	tooñ-ii	**koye**	**men**	(Toucouleur)
we	harm-ASP	heads	our	

'We have harmed ourselves.' (Sylla 1993: 149)

abono-ra	na-noki-a-'a-ha	(Paumarí)
self-OBJ	CAUS-see-DETRANS-ASP-THEME	

'He sees himself.' (Chapman & Derbyshire 1991:178)

b. *nonthematic element*

das	Buch	liest	**sich**	gut	(German)
the	book	reads	SE	good	

'The book reads well.'

c. *pronoun/clitic*

nrâ	dreghe-**nrî**	fadre	rroto	(Tiri)
3SG.SU	injure-3SG.OB	with	car	

'He injured himself in a car.' (Osumi 1995: 207))

d. *verb*

Juma	a-li-**ji**-pend-a	(Swahili)
Juma₁	1-PAST-REFL-love-FV	

'Juma loved himself.' (Hoekstra & Dimmendaal 1983: 69)

e. *auxiliary*

Yehpe	nochi	(Sie)
Y-ehpe	n-ocəh-i	
3SG:DISTPAST-do.reflexively	NOM-see-OB:3SG	

'He/she saw him/herself.' (Crowley 1998)

f. *secondary predicate*
   Irail **pein** duhp-irail (Ponapean)
   3PL self bathe-3PL
   'They bathed themselves.' (Rehg 1981:301)

g. *adverb*
   Atakusa a-nö kama nia sapa **ko-pa-so-ma** (Sanuma)
   gun 3SG-INST 3SG shoot reverse:DIR return-EXT-FOC-COMPL
   'He shot himself with a gun.' (Borgman 1991:43)

(65)   Morphology realizes the dependency on a term of the dependent

(66)   Questions:
   ● which term and why?
   ● is there any 'non-dependent marking' ?

(67)   Head-marking languages mark dependency on the head of the dependent category.

(68)   Baker's Generalization: polysynthetic languages lack NP-anaphors (Baker 1996)

(69)   Follows if NP-anaphors are nonhead-marking devices for the expression of dependency.

(70)   Potential cases of nondependent marking:
   - specifier possessor marking (genitive)
   - adjective agreement (gender)
   - object agreement on verb
   - agreeing complementizers/prepositions
   - mutual dependency marking (German *ihm sein Buch*)

(71)   Project: find such cases and study them