

**THE STRUCTURE OF EMBEDDED CP-DOMAINS: EVIDENCE FROM DUTCH DIALECTS
(AND NEW QUESTIONS FOR RESEARCH ON LANGUAGE IN APHASIA)**

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OUTLINE OF THE TALK

MAIN GOALS: (i) to show that dialectal data can help clarify the fine structure of the left periphery in embedded clauses, and (ii) to show that the fine grained linguistic distinctions uncovered by dialectal data raise new research questions for the study of language in aphasia and might even provide new insights into (existing) data on aphasic speech production and comprehension

1. introduction: doubly filled COMP in Dutch
2. the left periphery in Dutch embedded questions (Van Craenenbroeck 2004, 2010)
3. the left periphery in Dutch restrictive relative clauses (RRCs)
4. the study of microvariation and research on language in aphasia

1. INTRODUCTION: DOUBLY FILLED COMP IN DUTCH

- in recent generative linguistic literature much attention has been paid to arguing that the CP (or COMP) projection consists in fact of more than one functional projection (particularly in the cartographic tradition, cf. Rizzi 1997, 2004 a.o.), cf. Van Craenenbroeck 2010
- Dutch dialectal data provide clues as to what the structure of the left periphery in embedded clauses looks like in Dutch; most prominent are doubly filled COMP data

- (1) Doubly filled COMP filter (DFCF): *_[COMP wh-phrase complementizer]
[Chomsky & Lasnik (1977:435)]
- (2) embedded *wh*-questions
 - a. I wonder *who* has done it.
 - b. *I wonder *who that* has done it. [modern Standard English]
- (3) restrictive relative clauses
 - a. That is the man I saw.
 - b. That is the man *who* I saw.
 - c. That is the man *that* I saw.
 - d. *That is the man *who that* I saw. [modern Standard English]
 - some varieties of Dutch violate the DFCF in (1):
- (4) embedded *wh*-questions

a.	Ik vraag me af <i>wie</i>	het gedaan heeft.	[Standard Dutch]
b.	Ik vraag me af <i>wie of</i>	het gedaan heeft.	[colloquial Dutch]
c.	Ik vraag me af <i>wie dat</i>	het gedaan heeft.	[southern Dutch]
d.	Ik vraag me af <i>wie of dat</i>	het gedaan heeft.	[colloquial Dutch]

I wonder who ((whether) (that)) it done has
'I wonder who has done it.'

- (5) restrictive relative clauses with a *d*-pronoun

a.	Dat is de man <i>die</i>	het gedaan heeft.	[Standard Dutch]
b.	Dat is de man <i>die dat</i>	het gedaan heeft.	[Waesland Dutch]

that is the man REL.PRON. (that) it done has
'That is the man who has done it.'
- (6) restrictive relative clauses with a *wh*-pronoun

a.	Dat is het huisje <i>wat</i>	ik gezien heb.	[colloquial Dutch]
b.	Dat is het huisje <i>wat of</i>	ik gezien heb.	[colloquial Dutch]
c.	Dat is het huisje <i>wat dat</i>	ik gezien heb.	[southern Dutch]

that is the house what (whether) (that) I seen have
'the house that I have seen'
- (7) embedded yes/no questions

a.	Ik vraag me af <i>of</i>	hij het gedaan heeft.	[Standard Dutch]
b.	Ik vraag me af <i>of dat</i>	hij het gedaan heeft.	[colloquial Dutch]

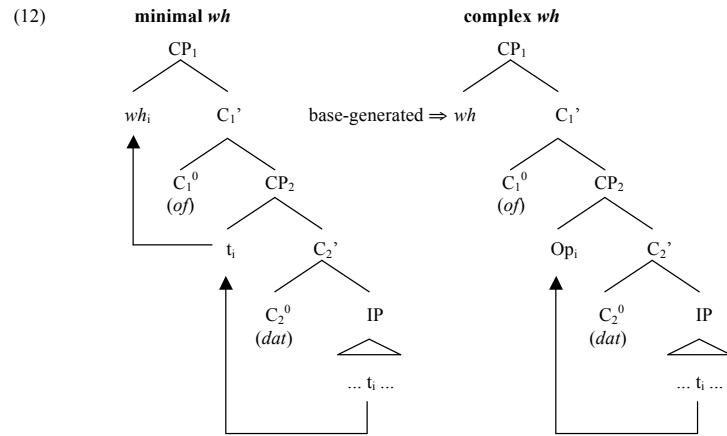
I wonder whether (that) he it done has
'I wonder whether he has done it.'

2. THE LEFT PERIPHERY IN DUTCH EMBEDDED QUESTIONS

- some arguments in favor of *of* and *dat* being two separate functional heads (cf. Hoekstra 1993a, 1993b, Hoekstra & Zwart 1994, 1997, Bennis 1997, 2000, Van Craenenbroeck 2004 a.o.; contra Sturm 1996):

- I** each complementizer may appear on its own (Bennis 2000:45) and is associated with its own semantic effect
- (8) a. het feit *dat*/**of* hij op tijd is
the fact *that*/**whether* he on time is
'the fact that he is on time'
 - b. *de* vraag *of*/**dat* hij op tijd is
the question *whether*/**that* he on time is
'the question whether he is on time' [Hoekstra 1993a:193]
- II** a *wh*-phrase can split up the complementizer sequence *of dat*
- (9) Ik weet niet *of* met wie *dat* Jan oan et proate was.
I know not *whether* with who *that* Jan on it talk was
'I don't know who Jan was talking to.' [Strijen Dutch; Van Craenenbroeck 2004:35]
- III** conjunction reduction
- (10) Ik vraag me af [*of* [*dat* Ajax de volgende ronde haalt] en [*dat* Celtic verslagen kan worden]].
I wonder *whether* *that* Ajax the next round reaches and *that* Celtic beaten can be
'I wonder whether Ajax will reach the next round and whether Celtic can be beaten.'
[colloquial Dutch; Hoekstra 1993a:193]
 - (11) a. *_[om-]_{[dat} het nu regent] en _{[-dat} het straks gaat sneeuwen]]
because it now rains and -because it later will snow
'because it rains now and it will snow later'
 - b. *_[in-]_{[dien} hij koning is] en _{[-dien} zij koningin is]]
if he king is and -if she queen is
'if he is king and she is queen' [Hoekstra 1993a:192]

- **Van Craenenbroeck (2004, 2010)**; cf. Reinhart (1981), Hoekstra (1993a, 1993b), Hoekstra & Zwart (1994, 1997), Bennis (1997, 2000), and see also Bhatt & Yoon (1992), Rizzi (1997)



- clause typing in CP₁ (compare *ForceP* (Rizzi 1997), or *TypP* (Bennis 1997, 2000))
- creation of operator-variable dependencies in CP₂; also subordination (cf. *SubP* (Bennis 1997, 2000))
- bare *wh*-pronouns (or PPs containing them) vs. complex *wh*-phrases (syntactic complexity is relevant, not D-linking (Pesetsky 1987)), cf. Van Craenenbroeck (2004:35-45):

I the operator/non-operator status of *wh*-phrases

(13) clitic doubling of *wh*-phrases in Romanian

- Pe cine (*I-) ai văzut?
PE who him_{CLITIC} have.you seen
'Who did you see?'
- Pe care băiat (*I-) ai văzut?
PE which boy him_{CLITIC} have.you seen
'Which boy did you see?'

(14) WCO effects in English *wh*-in-situ

- ?Which grade did his_i teacher give [which student]_i?
- *Which grade did his_i teacher give who_i? <WCO violation>

(15) superiority effects in English

- What did which student buy?
- *What did who buy? <superiority violation>

(16) Contrastive Left Dislocation (CLD) in Dutch

- [Die jongens]_i, die_i ken ik niet t_{die}.
those boys DEM.PRON. know I not
- *Iedereen_i, die_i ken ik niet t_{die}.
everybody, DEM.PRON. know I not
- ??[Welke jongen]_i, die_i heb je t_{die} gezien?
which boy, DEM.PRON. have you seen
- *Wie_i, die_i heb je t_{die} gezien?
who, DEM.PRON. have you seen

II *wh*-copying in German (cf. varieties of Dutch, e.g. Barbiers, Koenean & Lekakou 2009)

- Wen glaubt Hans wen Jakob gesehen hat?
who thinks Hans who Jakob seen has
'Who does Hans think that Jakob saw?'
- *Wessen Buch glaubst du wessen Buch Hans liest?
whose book think you whose book Hans reads
'Whose book do you think Hans reads?'

III preposition stranding in Dutch

- {Waar/*Wat} heb je die kist mee opengemaakt?
where/what have you that crate with open.made
'What did you open that crate with?'
- de sleutel [Op om het slot mee open te doen]
the key for the lock with open to do
'the key to open the lock with'
- a. *(Met) wie wil je niet mee samenwerken?
with who want you not with cooperate
- b. (Met) welke jongen wil je niet mee samenwerken?
with which boy want you not with cooperate
'Which boy don't you want to cooperate with?'

IV definite free relatives in Dutch – truncated CP-structure (only CP₂)

- Wat op tafel ligt is voor jou.
what on table lies is for you
'What lies on the table is for you.'
- *Welk boek op tafel ligt is voor jou.
which book on table lies is for you
- *Wat of op tafel ligt is voor jou.
what whether on table lies is for you
- Wat dat op tafel ligt is voor jou.
what that on table lies is for you
'What lies on the table is for you.'

Table 1: predictions of Van Craenenbroeck's (2004) analysis of the left periphery in embedded questions

SpecCP ₁	C ₁ ⁰	SpecCP ₂	C ₂ ⁰	occurrence
	of			Standard Dutch
	of		dat	colloquial Dutch (Bennis 1997:353)
wie _i		t _i		Standard Dutch
wie _i	of	t _i		colloquial Dutch (Bennis 1997:353)
wie _i	of	t _i	dat	colloquial Dutch (Bennis 1997:353)
wie _i		t _i	dat	southern Dutch/Belgian dialects (Haegeman 1992:55, Bennis 2000:44)
welke man		Op		Standard Dutch
welke man	of	Op		colloquial Dutch (Van Craenenbroeck 2004:44)
welke man	of	Op	dat	colloquial Dutch (Hoekstra 1993a:59)
welke man		Op	dat	colloquial Dutch (Hoekstra 1993b:161)
	of	(met) wie		?Strijen Dutch (Van Craenenbroeck 2004:34)
	of	(met) wie	dat	?Strijen Dutch (Van Craenenbroeck 2004:35)

N.B. the analysis correctly predicts: *[dat of], *[of complex *wh*-phrase (dat)], and [of dat *wh*-element]

3. THE LEFT PERIPHERY IN DUTCH RESTRICTIVE RELATIVE CLAUSES

I complex *wh*-phrases introduced by *welke* ‘which’ are not allowed in restrictive relatives

- (21) a. **Ze zag een man welke stakkerd zijn been had gebroken.*
 ‘She saw a man which wretch had broken his leg.’
 b. **Ze las een boek welke roman door Reve was geschreven.*
 ‘She read a book which novel was written by Reve.’ [De Vries 2004:200]

II no clause typing in (Dutch) restrictive relative clauses

- there is no designated element in Dutch that is responsible for the clause typing in RRCs (cf. Wiltschko 1998: there is no such thing as a relative pronoun)
- a relative clause is nothing more than a subordinate clause that contains a variable, so it is hard to imagine how the clause should be typed ([+relative] is not really an option, cf. Wiltschko 1998)

III in contrast to *wie of dat* in *wh*-questions, the string *wie of dat* is not attested in restrictive relative clauses (SAND data, Barbiers et al. 2005, 2006, and further field research)

- (22) a. Vertel maar niet *wie of dat* ze had kunnen roepen. [20/240]
 tell just not who whether that she had can call
 ‘You better don’t tell her who she could have called.’
 b. Dat is de man *wie* het verhaal verteld heeft. [39/233]
 that is the man who the story told has
 ‘That is the man who told the story.’
 c. Dat is de man *wie* ze geroepen hebben. [47/244]
 that is the man who they called have
 ‘That is the man who they have called.’

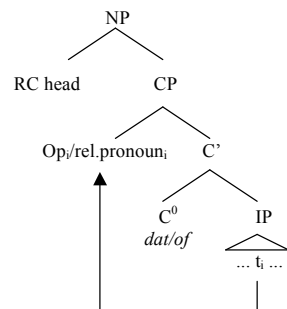
- only 6 dialects allow *wie of dat* in questions and make use of relative pronoun *wie*, but:

- (23) a. *Dat is de man *wie of dat* het verhaal verteld heeft.
 that is the man who whether that the story told has
 b. *Dat is de man *wie of dat* ze geroepen hebben.
 that is the man who whether that they called have
 c. *Dat is de man *wie of dat* ze het cadeau gegeven hebben.
 that is the man who whether that they the present given have

- all six informants denied the occurrence of *wie of dat* in restrictive relatives in their dialects

⇒ RRCs have only one CP-layer when compared to embedded questions (cf. Reinhart 1981)

(24) RRC structure in Dutch – *first version*



BUT:

- theoretical: *D-complement hypothesis* (cf. Smith 1964, Kayne 1994, Schmitt 2000, De Vries 2002, Aoun & Li 2003 a.o.); examples (25) and (26) are adapted from De Vries (2002:74-75)

- (25) *selectional restrictions between external determiner and relative clause*
- a. Ik zag de koningin van Nederland *(,) die B. heet. <*restrictive/appositive>
 I saw the queen of Holland *(,) who is called B.
 b. Elk artikel *(,) dat over B. gaat, is interessant. <restrictive/*appositive>
 Any article *(,) which is about B., is interesting.

(26) *close connection between external (definite) determiner and relative clause*

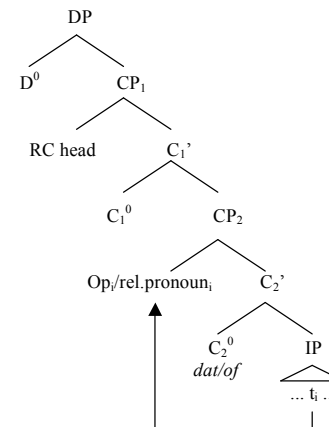
- a. Ik vond *(de) twee foto’s van Jan.
 I found *(the) two pictures of John’s.
 b. Ik vond de twee foto’s van Jan *(die jij me geleend had).
 I found the two pictures of John’s *(that you lent me).

- empirical: Amsterdam Dutch data (Hoekstra 1994:316)

- (27) a. de auto *of waar* ik in reed
 the car whether where I in drove
 b. de vrouw *of die* ik gezien heb
 the woman whether REL.PRON. I seen have

- the structure in (24) is incompatible with a D-complement hypothesis and cannot accommodate the Amsterdam Dutch data in (27)

(28) RRC structure in Dutch – *final version*



N.B. for current purposes it is irrelevant whether the relative clause head is base-generated in SpecCP₁ (cf. Schmitt 2000, Aoun & Li 2003) or whether the head (together with the operator or relative pronoun) is raised from lower inside the relative clause (*head raising*, cf. Zwart 2000, and see e.g. Kayne 1994, and De Vries 2002 for head raising and a single CP-layer)

- clause typing in CP₁: only relative complementizers (that are *specific* for relative clauses) are allowed to occur there; as there are no relative complementizers in Dutch, C₁⁰ is always empty (except for *of* in Amsterdam Dutch, see (27), suggesting that *of* is a relative complementizer instead of an interrogative complementizer in this particular dialect, cf. *infra*)
- creation of operator-variable dependencies in CP₂; also subordination (N.B. the distribution of complementizer *of* across clause types is not restricted to C₁⁰ (compare (12) and (28))

Table 2; predictions of relative clause structure (28), cf. Boef (to appear)

SpecCP ₁	C ₁ ⁰	SpecCP ₂	C ₂ ⁰	occurrence
RC-head		d _{REL}		Standard Dutch
RC-head		d _{REL}	dat	Waasland Dutch (SAND data)
RC-head		d _{REL}	of	unattested
RC-head		wh _{REL}		Achterhoek Dutch (SAND data)
RC-head		wh _{REL}	dat	Groenlo Dutch (SAND data)
RC-head		wh _{REL}	of	colloquial Dutch (Hoekstra 1993a:197)
RC-head		Op _{REL}		unattested
RC-head		Op _{REL}	dat	Vlaams-Brabant Dutch (SAND data)
RC-head		Op _{REL}	of	unattested
RC-head	of(C _{REL} ?)	d _{REL} /wh _{REL}	(dat?)	Amsterdam Dutch (Hoekstra 1994)

- [Op_{REL}] is unattested because zero-relativization is not allowed in Dutch (cf. Dekkers 1999, SAND data: Barbiers et al. 2005, 2006, Boef 2008a, 2008b)
- [Op_{REL} of] and [d_{REL} of] are unattested because interrogative *of* can only be licensed by an overt *wh*-element in its specifier, or a [+Q] environment as in yes/no questions (as *of* in Amsterdam Dutch RRCs doesn't adhere to this generalization, it probably is not an interrogative complementizer, rather – given (28) – it most likely is a relative complementizer)

- yes/no questions are easily accounted for under the proposed split CP-structure of embedded clauses

(29) Ik vraag me af [CP₁ of [CP₂ (dat) hij nog komt]].
I wonder whether that he still comes
'I wonder whether he will still come.'

- similarly, other constructions with double complementizers also fit (cf. Bennis 1997, 2000)

(30) a. Jan heeft meer boeken gelezen [CP₁ dan [CP₂ (dat) ik er in de kast heb staan]].
Jan has more books read than that I there in the bookcase have stand
b. Jan is net zo groot [CP₁ als [CP₂ (dat) ik ben]].
Jan is just as big as that I am
c. Jan ging naar huis [CP₁ voor [CP₂ (dat) ik hem kon spreken]].
Jan went to home before that I him could speak [Bennis 2000:45-46]

- also, left dislocation structures seem to fit the proposed split CP-structure (notice that left dislocation is a *root* phenomenon, and at this point it is unclear if the split CP-structure should also be assumed for all root clauses)

(31) a. Naar zijn_i promotie, daar kijkt [iedere taalkundige]_i naar t_{daar} uit.
to his defense there looks every linguist to out
'Every linguist looks forward to his defense.' [Van Craenenbroeck 2004:48]
b. [CP₁ naar zijn_i promotie C₁' [C₁ ∅ [CP₂ daar C₂' [C₂ kijkt [IP ... t_{daar} ...

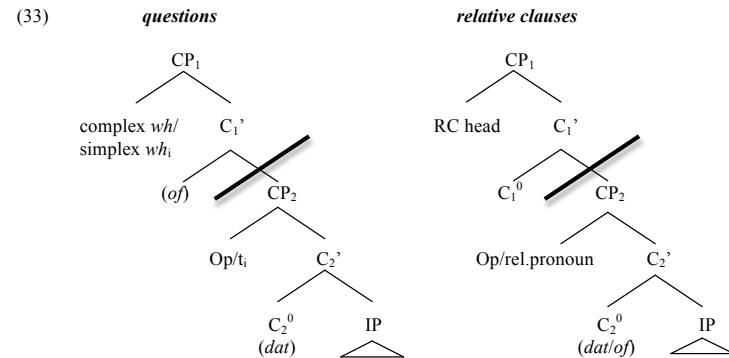
- important question: how universal is structure (28)?
 - Schmitt (2000) and Aoun & Li (2003) have argued for a similar construction for (some) relative clauses in English (and Lebanese Arabic)
 - (28) can accommodate RRCs in which both a complementizer that is specific to relative clauses (C₁⁰) as well as a declarative complementizer (C₂⁰) can be used in one clause:

(32) a. clovek, [CP₁ ki [CP₂ (da) pride [Slovene; Hladnik 2010:14]
the man C_{REL} that is coming
b. manninn [CP₁ sem [CP₂ (að) kom hingað [Icelandic; Boef & Franco 2010]
the man C_{REL} that came here

4. THE STUDY OF MICROVARIATION AND RESEARCH ON LANGUAGE IN APHASIA

4.1. PRODUCTION IN BROCA'S AGRAMMATIC APHASIA

- particularly the high left periphery (CP-domain) seems to be affected in Broca's agrammatic aphasia (cf. Friedmann 2003 for speech production; see Christensen 2008 who shows that syntactic movement that targets the CP-domain shows activation in Broca's area (a.o.))
- representational (syntactic-deficit) account *Tree Pruning Hypothesis* (Friedmann & Grodzinsky 1997, Friedmann 1998, 2002): the syntactic tree of agrammatic patients is pruned at the Tense⁰ node, or higher up (at C⁰)
- prediction: assuming the Tree Pruning Hypothesis is on the right track and given the split CP-hypothesis argued for above – i.e. the CP domain is most likely split in several different functional projections (just like the IP domain is split into e.g. TenseP, NegP and AgrP) –, we predict that *in principle* patients can have a syntactic tree that is pruned somewhere *within* CP (in milder cases of agrammatism; there is much variation in the degree of severity of the deficit, cf. Kolk 2007 a.o.)



- the ability to embed declarative sentences (CP-complements introduced by *dat*) should be intact (generally not borne out, also for Dutch, cf. Friedmann 2002:169)
- the ability to form (embedded) *wh*-questions and (embedded) yes/no questions should be impaired (borne out for Dutch *root wh*-questions: Ruigendijk, Kouwenberg & Friedmann 2004, but see Neuhaus & Penke 2008 for German *root wh*-questions with simplex *wh*-phrases)
- the ability to form (embedded) *wh*-questions with a complex *wh*-phrase might be even more impaired than the ability to form (embedded) *wh*-questions with a simplex *wh*-phrase (cf. Strijnen Dutch data in (9): a simplex *wh*-phrase may not move further than SpecCP₂)
- given (28) (but not given (24)) the ability to form restrictive relative clauses should be impaired
- taking Van Craenenbroeck's (2004) analysis of free relatives in Dutch to be correct – i.e. they have a truncated CP-structure (only CP₂) – the ability to form free relatives should be intact

4.2. COMPREHENSION IN BROCA'S AGRAMMATIC APHASIA

- origin of movement (*Trace Deletion Hypothesis*, Grodzinsky 1995)
- type of movement (*Types of Movement Hypothesis*, Van der Meulen 2004)
- movement path, intervention effects (*Generalized Minimality*, Grillo 2008)
- target of movement (*The Domain Hypothesis*, Christensen 2008)

- only the hypothesis in (ii) makes different predictions when (12) and (28) are assumed

(34) *Types of Movement Hypothesis* (Van der Meulen 2004:180; languages: French (& English))
1. In Broca's aphasia the syntactic relation between a moved item and its original position is impaired.

2. The level of impairment depends on the type of syntactic movement: XP-movement affects patients' comprehension more severely than head movement or feature movement.

- *prediction*: assuming the difference between (embedded) *wh*-questions involving complex *wh*-phrases and *wh*-questions involving simplex *wh*-phrases as discussed above (cf. (12)), the comprehension of the latter type of question is predicted to be more impaired than that of the former, because only questions with simplex *wh*-elements involve XP (or *category*) movement
- not borne out for English *root wh*-questions (English data from Hickok & Avrutin 1995, cf. Salis & Edwards 2008; see Neuhaus & Penke 2008 for similar German data)

(35) a. which boy pushed the girl? <above chance performance>
b. which boy did the girl push *t*? <chance performance>
c. who pushed the girl? <above chance performance>
d. who did the girl push *t*? <above chance performance>

- these facts might be accounted for by Tree Pruning (for *comprehension*) in combination with a split CP-domain (for *root* questions); but see also Salis & Edwards' (2008) *Set Partition Hypothesis* (semantic processing account)

⇒ the fine grained linguistic distinctions uncovered by dialectal data (i.e. a finer grained structure of the left periphery) raise new research questions for aphasiology research and might even provide new insights and give a better handle on (existing) data on aphasic speech production and comprehension; reciprocally, further research into aphasia is extremely valuable for linguistic theory as data from aphasic speech can (dis)confirm certain linguistic hypotheses, like

- the CP-domain consists of more than one functional projection (*split CP-domain hypothesis*)
- *wh*-movement of *simplex wh*-phrases is different from *wh*-movement' of *complex wh*-phrases
- the structure of headed restrictive relatives (RRCs) is (potentially) different from the structure of headless relatives (free relatives)

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