

Does Chain Hybridization in Irish Support Movement-Based Approaches to Long-Distance Dependencies?

(a self tutorial)

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1. Introduction

Aim of the talk:

Discuss Huybregts's (2009) claim that hybrid A-bar chains in Irish favor derivational theories of syntax over representational.

Conclusions to be reached:

- In principle, both derivational and representational theories can account for hybrid chains. No argument in favor of one or the other type of theory can be made on the basis of this phenomenon.
- Issues to be grappled with (punctuated vs. uniform paths, double-flick chains) are (often) orthogonal to the derivational-representational dichotomy.

1.1. Irish A-Bar Chains

(1) Three types of complementizers

- a. aN (A-bar, resumption)
- b. aL (A-bar, movement)
- c. go (declarative)

(2) Uniform chains

- a. [_{CP} aL... [_{CP} aL... t]]
- b. [_{CP} aN... [_{CP} aN... pro]]
- c. [_{CP} go... [_{CP} go...]]

- a. an tainm **a** hinndeachd dúinn **a** bhí _ ar an áit
the name aL was.told to.us aL was on the place
- b. "the name that we were told was on the place"

- a. an bhean **a** raibh mé ag súil **a** bhfaighim uaithe é
the woman aN was I hope prog aN get.COND from.her it
- b. "the woman that I was hoping that I would get it from her"

- c. Dúirt mé [_{CP} **gu**-r shíl mé [_{CP} **go** meadh sé am]]
said I go-PAST thought I go would.be he there
"I said that I thought that he would be there."

(4) Hybrid chains

- a. [_{CP} aN... [_{CP} aL... t]]
- b. [_{CP} aL... [_{CP} aN... pro]]
- c. [_{CP} aN... [_{CP} go... pro]]

(Pattern 1)

(Pattern 2)

- a. rud **a** raibh coime aige **a** choinhlfonfadh _ an aimsir
thing aN was expectation at.him aL fulfill.COND the time
"something that he expected time would confirm"
- b. aon duine **a** cheap sé **a** raibh nuaimne tobac aige
any person aL thought he aN was scrap tobacco at.him
"anyone that he thought had a scrap of tobacco"
- c. achan rud **a** raih dóchas aca **go** diocfadh sé
every thing aN was hope at.them go come.COND it
"everything that they hoped (that it) would come"

1.2. Huybregt's Claim

Huybregts (2009):

Hybrid chains in Irish (Pattern 1 and 2; (4-a,b)) receive an analysis in a derivational theory (such as the MP) but they can hardly be accounted for in syntactic theories that are representational (such as LFG or HPSG).

2. Hybrid Chains in MP

Analysis:

McCloskey's (2002) theory, which is based on Chomsky (2000; 2001).

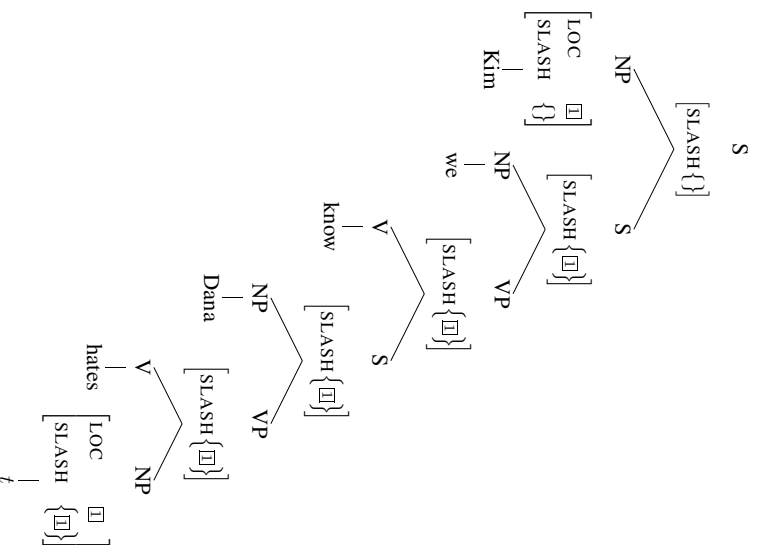
(6) Featural make-up of C in Irish

- a. go ↔ C[Ø]
- b. aN ↔ C[EPF]
- c. aL ↔ C[EPF,OP]

Assumption/consequence:

- Both wh-phrases ('operators') and resumptive pronouns are pronouns: *pro*.
- One and the same *pro* can serve both as an operator and as a resumptive pronoun within a derivation.

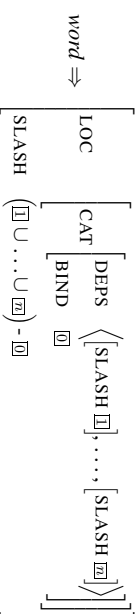
(13)



Alternative:

SLASH features are introduced by lexical heads via the rule in (14) and percolated by the SLASH Inheritance Principle in (15).

(14) *Slash-Amalgamation* (Bojawa et al. (2001, 20))

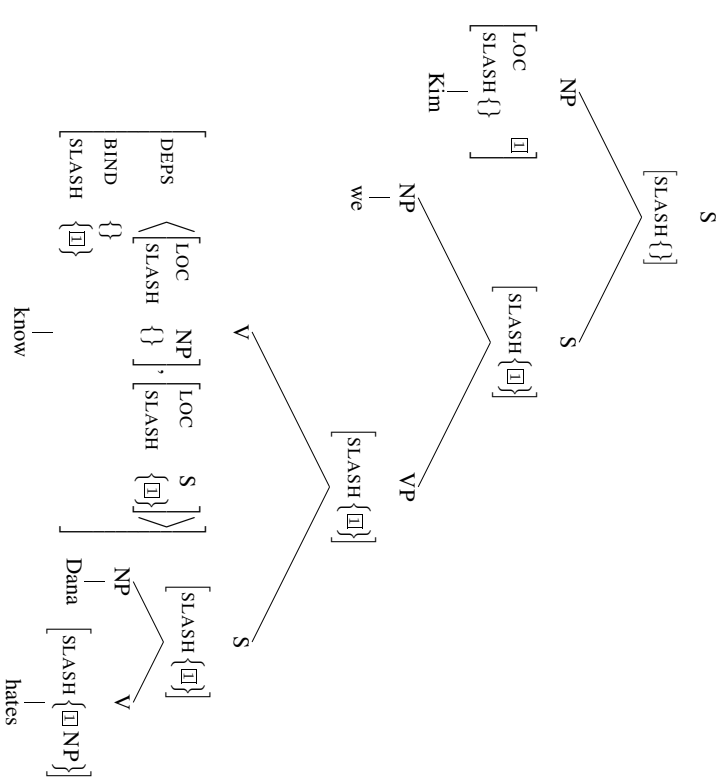


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(15) *Slash Inheritance* (Bojawa et al. (2001, 20)):



(16)



Resumption (Valliere (2002)):

The dependency between a resumptive pronoun and its antecedent is established by a RESUMP feature, introduced by the pronoun (17). RESUMP behaves just like SLASH with respect to percolation and binding.

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$$(17) \quad \text{resumptive pronoun} \Rightarrow \begin{bmatrix} \text{LOC} & \boxed{1} \\ \text{SLASH} & \{ \} \\ \text{RESUMP} & \{ \boxed{1} \} \end{bmatrix}$$

Head-filler generalized:

The Head-Filler Phrase Rules in (18) ensure that the SLASH value *or* the RESUMP value of the head daughter that corresponds to the local value of the filler can be deleted.

(18) *Head-Filler Phrase Rules*

a. SLASH Rule

$$\text{hd-filler-phr} \Rightarrow \begin{bmatrix} \text{SLASH} & \boxed{2} \cup \boxed{3} \\ \text{RESUMP} & \boxed{4} \cup \boxed{5} \\ \text{HD-DTR} & \begin{bmatrix} \text{SLASH} & \boxed{2} \cup \{ \boxed{1} \} \\ \text{RESUMP} & \boxed{4} \end{bmatrix} \\ \text{NON-HD-DTRS} & \begin{bmatrix} \text{LOC} & \boxed{1} \\ \text{SLASH} & \boxed{3} \\ \text{RESUMP} & \boxed{5} \end{bmatrix} \end{bmatrix}$$

b. RESUMP Rule

$$\text{hd-filler-phr} \Rightarrow \begin{bmatrix} \text{SLASH} & \boxed{2} \cup \boxed{3} \\ \text{RESUMP} & \boxed{4} \cup \boxed{5} \\ \text{HD-DTR} & \begin{bmatrix} \text{SLASH} & \boxed{2} \\ \text{RESUMP} & \boxed{4} \cup \{ \boxed{1} \} \end{bmatrix} \\ \text{NON-HD-DTRS} & \begin{bmatrix} \text{LOC} & \boxed{1} \\ \text{SLASH} & \boxed{3} \\ \text{RESUMP} & \boxed{5} \end{bmatrix} \end{bmatrix}$$

3.2. Morphological Reflexes in HPSG

Crucial point:

The SLASH feature is present on all intermediate nodes on the path of a unbounded dependency.

Idea:

- Different morphological forms of Cs correspond to different lexical entries.
- Cs that occur when there is movement combine with phrases that have a non-empty SLASH feature list.
- Cs that occur when there is resumption combine with XPs with an non-empty RESUMP feature list.

(19) a. *lexical entry of aL*

$$\begin{bmatrix} \text{SYN} & [\text{HEAD } C] \\ \text{ARG-ST} & \begin{bmatrix} \text{VP} \\ \text{SLASH } \text{next} \end{bmatrix} \end{bmatrix}$$

b. *lexical entry of aN*

$$\begin{bmatrix} \text{SYN} & [\text{HEAD } C] \\ \text{ARG-ST} & \begin{bmatrix} \text{VP} \\ \text{SLASH } \text{eset} \\ \text{RESUMP } \text{next} \end{bmatrix} \end{bmatrix}$$

c. *lexical entry of go*

$$\begin{bmatrix} \text{SYN} & [\text{HEAD } C] \\ \text{ARG-ST} & \begin{bmatrix} \text{VP} \\ \text{SLASH } \text{eset} \end{bmatrix} \end{bmatrix}$$

Conclusion:

- Long-distance dependencies are modelled by percolating two types of features: SLASH and RESUM.
- Hybrid chains are composed of two (or more) adjacent dependencies of a different type.
- The paths involved are punctuated (not uniform) in the sense that the change from one feature to another is only possible in designated positions.

An alternative:

A shift in chain-type could (in principle) also be brought about by modifying Bouma et al.'s (2001)) mechanism of *Slash-Amalgamation* (25).

(24) *Two types of SLASH features*

- SLASH $\boxed{\text{RESUM}}$
- SLASH $\boxed{\text{MOVE}}$

(25) *Slash-Amalgamation*

- $$\text{word} \Rightarrow \left[\begin{array}{c} \text{LOC} \\ \text{CAT} \\ \text{SLASH } (\boxed{\alpha} \cup \dots \cup \boxed{\beta}) \end{array} \left[\begin{array}{c} \text{DEPS} \langle \langle \text{SLASH } \boxed{\alpha} \rangle, \dots, \langle \text{SLASH } \boxed{\beta} \rangle \rangle \\ \text{BIND } \boxed{\alpha} \end{array} \right] \right]$$
- $$a, \beta \in \{\text{RESUM}, \text{MOVE}\}$$

Problem:

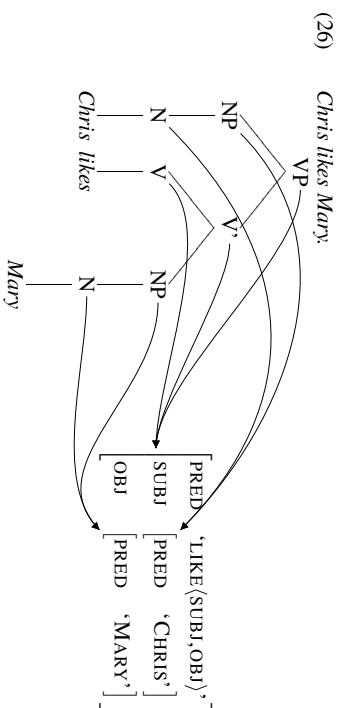
- This time, the paths involved are uniform: Every head may switch between $\boxed{\text{RESUM}}$ and $\boxed{\text{MOVE}}$.
- As before, a derivation may cross an island boundary via $\boxed{\text{RESUM}}$, switch to $\boxed{\text{MOVE}}$ immediately afterwards.
- As mentioned at the end of section 2., such a derivation generates *adL* in the C-Position immediately above the island, which is the wrong result.

4. LFG

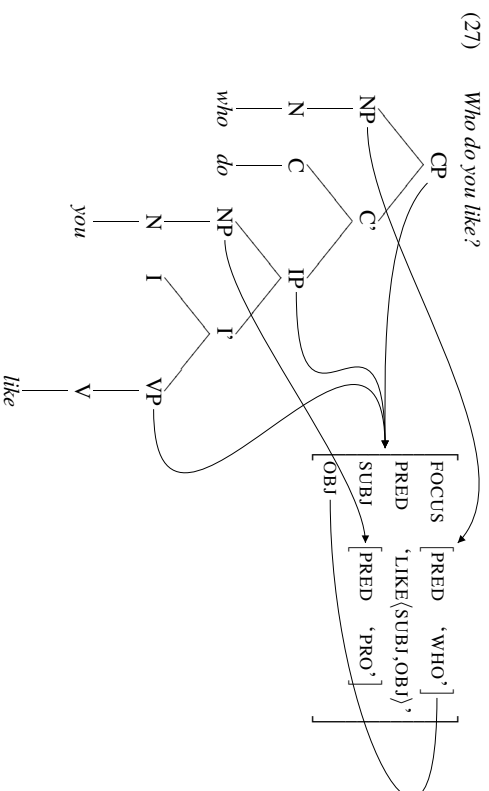
4.1. Movement in LFG

F-structure and c-structure:

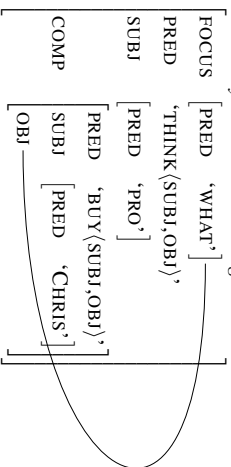
LFG distinguishes between c(constituent)-structure and f(functional)-structure. C-structures are familiar constituent trees. F-structures indicate the grammatical functions of all nodes and dependencies between them.



Movement:
Movement dependencies are indicated as identity between two positions. For the present purposes, the top-member is always a FOCUS position.



(28) *What do you think Chris bought?*



Wh-movement:

There is a dependency between FOCUS and some GF (SUBJ, OBJ, OBL, ...) that spans an arbitrary number of complements (COMP*).

(29) CP → $\left(\begin{array}{c} \text{XP} \\ (\uparrow \text{FOCUS}) = \downarrow \\ (\uparrow \text{FOCUS}) = (\uparrow \text{COMP}^* \text{GF}) \end{array} \right) \left(\begin{array}{c} \text{C}' \\ (\uparrow = \downarrow) \end{array} \right)$

Legend:

- ↓: the present node
- ↑: the present node's mother
- GF: {SUBJ, OBJ, OBL, ...}
- (↑ FOCUS) = ↓: the present constitutes the FOCUS function of its mother (= the CP)

Remarks:

- **crucial part:** '(↑ FOCUS) = (COMP* GF)'
- ⇒ The FOCUS element of the CP (= the moved item) is identical with something that can be reached from CP by a path that conforms to the following restriction: *An arbitrary number of COMP's (including zero), followed by a GF.*
- (27): (↑ FOCUS) = (↑ OBJ)
- (28): (↑ FOCUS) = (↑ COMP OBJ)

(30) *Extended Coherence Condition* Dalrymple (2001, 390)

FOCUS and TOPIC must be linked to the semantic predicate argument structure of the sentence in which they occur, either by functionally or by anaphorically binding an argument.

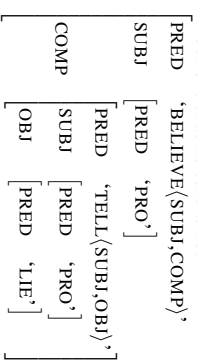
Note:

All possible dependency paths need to be stipulated via a regular expression. If nothing is said, no dependencies are available.

4.2. Morphological Reflexes in LFG

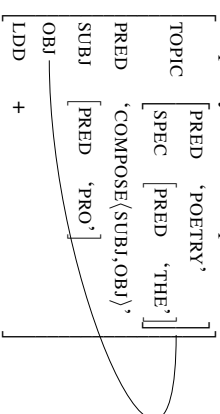
(31) *Irish*

- a. Creidim **gu-r** inis sé bréag
I-believe go-PAST tell he lie
"I believe that he told a lie."
- b. [PRED 'BELIEVE(SUBJ,COMP)']
SUBJ [PRED 'PRO']
COMP [PRED 'TELL(SUBJ,OBJ)']
SUBJ [PRED 'PRO']
OBJ [PRED 'LIE']



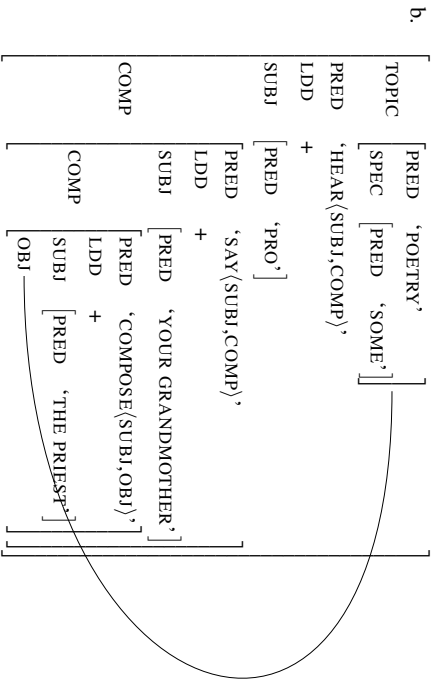
(32)

- a. an fhilíocht **a** chum sí —
the poetry al composed she
"the poetry that she composed"
- b. [PRED 'POETRY']
TOPIC [PRED 'THE']
SPEC [PRED 'COMPOSE(SUBJ, OBJ)']
SUBJ [PRED 'PRO']
OBJ [PRED 'LIE']



(33)

- a. cuid den fhilíocht **a** chualais ag do sheamhánhathair
some-of-the poetry al heard by your grandmother
á rá **a** cheap an sagart úd —
being-said al composed the priest DEMON
"some of the poetry that you heard your grandmother saying that
that priest composed"



$$(34) \quad (\uparrow \text{TOPIC}) = (\uparrow \text{COMP}^* \quad \text{GF} \quad) \\ (\leftarrow \text{LDD}) = + \quad (\leftarrow \text{LDD}) = +$$

Legend:

(\leftarrow LDD): the LDD value of the mother node

(35) The f-structure for an utterance is the *minimal solution* satisfying the constraints introduced by the words and phrase structure of the utterance. Dalrymple (2001, 101)

(36) *Lexical constraints:*
al: (\uparrow LDD)
go: $\neg(\uparrow$ LDD)

Comparison with HPSG:

- In HPSG, every node that lies in the range of a dependency is marked (i.e. it bears a SLASH feature).
- In LFG, the movement algorithm itself does not give rise to two distinguishable sorts of COMP's. Thus, LDD must be stipulated on top of the dependency. Its sole function is to capture morphological marking.
- In this respect, the HPSG account thus appears more natural.

4.3. Hybrid Chains in LFG

(37) *Extended Coherence Condition*

FOCUS and TOPIC must be linked to the semantic predicate argument structure of the sentence in which they occur, either by functionally or by anaphorically binding an argument.

Note:

(37) is a well-formedness constraint on f-structure, *not* on movement paths. Thus single movement paths may violate (37) as long as the dependency as a whole conforms to it (cf. Bresnan and McHombo (1987)).

Proposal:

Several paths may be linked to each other if a single function is both the tail of one path and the head of a second path.

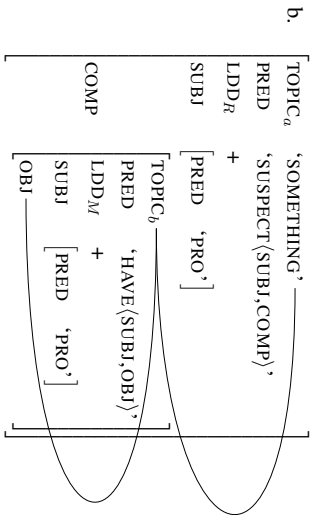
(38) *Relative Clause Rule*
 $\text{NP} \rightarrow \quad \text{NP} \quad \text{S}$

(39) *Topicalization Rule*
 $\text{S} \rightarrow \quad \text{NP} \quad \text{S}$

(40) $\text{RESUMPATH:} \quad \left\{ \begin{array}{l} \text{TOPIC} \mid \\ \text{COMP}^* \end{array} \right\} \quad \left\{ \begin{array}{l} \text{GF} \\ (\leftarrow \text{LDD}_R) = + \end{array} \right\}$
 $(\uparrow \text{TOPIC}) = \downarrow \quad (\uparrow \text{TOPIC}) = (\uparrow \text{RESUMPATH} \mid \text{MOVEPATH})$

(41) $\text{MOVEPATH:} \quad \left\{ \begin{array}{l} \text{TOPIC} \mid \\ \text{COMP}^* \end{array} \right\} \quad \left\{ \begin{array}{l} \text{GF} \\ (\leftarrow \text{LDD}_M) = + \end{array} \right\}$

(42) a. $\text{rud} \quad \mathbf{a} \quad \text{raibh tuairim láidir agam} \quad \mathbf{a} \quad \text{bheadh} \quad \text{—} \quad \text{aige}$
 thing aN was opinion strong at-me al be.COND at-him
 'something that I strongly suspected he would have'



Remark:

(42-b) respects the *Extended Coherence Condition*: All TOPIC functions are linked to a grammatical function (see (43)).

$$(43) \quad \begin{array}{l} \text{RESUMPATH} \\ \text{COMP} \quad \text{TOPIC} = \text{TOPIC}_b \\ \leftarrow \text{LDD}_R = + \\ \text{TOPIC}_a = \\ \text{MOVEPATH} \\ \text{GF} \\ \leftarrow \text{LDD}_M = + \\ \text{TOPIC}_b = \text{OBJ} \\ \text{TOPIC}_a = \text{OBJ} \end{array}$$

$$(44) \quad \begin{array}{l} \text{Morphological reflexes:} \\ \text{al: } (\uparrow \text{LDD}_M) \\ \text{an: } (\uparrow \text{LDD}_R) \\ \text{go: } \neg(\uparrow \text{LDD}) \end{array}$$

Punctuated vs. uniform:

- The analysis involves punctuated paths: Only TOPIC can be head and tail of a path at the same time and thus act as a linker. As there is only one TOPIC function per clause, path switching is possible only once per clause.
- It thus avoids the problem with respect to islandhood mentioned at the end of sections 2. and 3.

5. Outlook and Discussion

Suspicion:

Chains that involve a change over from one type of dependency towards another and back again (45-a-b) are ungrammatical. (Although we have not been able to confirm this suspicion yet.)

(45) *Double-flick chains*

- [_{CP} al... [_{CP} an... [_{CP} al... t]]]
- [_{CP} an... [_{CP} al... [_{CP} an... pro]]]

Problem:

All things equal, all three analyses discussed above derive these as possible structures. (46) and (47) illustrate this for the MP-analysis.

$$(46) \quad \begin{array}{l} \text{Derivation of (45-a) (based on Pattern 1):} \\ \text{① } [\text{CP OP}_i \text{ an} \dots [\text{CP OP}_i \text{ al} \dots t_i]] \rightarrow \dots \\ \text{② } [\text{CP C} \dots [\text{CP OP}_i \text{ an} \dots [\text{CP OP}_i \text{ al} \dots t_i]]] \rightarrow \text{Move(OP)} \\ \text{③ } [\text{CP OP}_i \text{ al} \dots [\text{CP } t_i \text{ an} \dots [\text{CP OP}_i \text{ al} \dots t_i]]] \end{array}$$

$$(47) \quad \begin{array}{l} \text{Derivation of (46-b) (based on Pattern 2):} \\ \text{① } [\text{CP OP}_i \text{ al} \dots [\text{CP } t_i \text{ an} \dots \text{pro}_i]] \rightarrow \dots \\ \text{② } [\text{CP C} \dots [\text{CP OP}_i \text{ al} \dots [\text{CP } t_i \text{ an} \dots \text{pro}_i]]] \rightarrow \text{Merge(OP)} \\ \text{③ } [\text{CP OP}_i \text{ an} \dots [\text{CP OP}_i \text{ al} \dots [\text{CP } t_i \text{ an} \dots \text{pro}_i]]] \end{array}$$

Conclusions:

- Both derivational and representational theories can account for hybrid chains. Therefore, no argument against one or the other type of theory can be made on the basis of this phenomenon.
- Hybrid chains appear to favor analyses in terms of punctuated paths, as opposed to uniform paths. This is an important result, however, it is orthogonal to the derivational-representational issue.
- All things equal, theories that are expressive enough to generate hybrid chains will also generate double-flick chains. Again, the issue is orthogonal to the derivational-representational dichotomy.

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