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

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1 Introduction

Huybregts' (2009) claim:
Hybrid A-bar chains in Irish favor derivational theories of syntax over representational ones.

This talk's claim:
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.

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 . . .]]

(3) a. an tainm **a** hinndeadh dúinn **a** bhí _ ar an áit
  the name aL was.told to.us aL was on the place
  "the name that we were told was on the place"
  b. an bhean **a** raibh mé ag súil **a** bhfaighinn uaithi é
  the woman aN was I hope prog aN get.COND from.her it
  "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 ann]]
  said I go-PAST thought I go would.be he there
  "I said that I thought that he would be there."

Note:
Relative pronouns in Irish are always phonologically empty. Resumptive pronouns are zero in certain environments. We accept McCloskey & Hale's (1984) arguments that these elements are resumptives.

(4) *Hybrid chains*
  a. [$_{CP}$ aN . . . [$_{CP}$ aL . . . t]] (Pattern 1)
  b. [$_{CP}$ aL . . . [$_{CP}$ aN . . . pro]] (Pattern 2)
  c. [$_{CP}$ aN . . . [$_{CP}$ go . . . pro]]

(5) a. rud **a** raibh coinne aige **a** choimhlíonfadh _ 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 ruainne 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** rabh dóchas aca **go** dtiocfadh sé
  every thing aN was hope at.them go come.COND it
  "everything that they hoped (that it) would come"

1.2 *Huybregts' claim*

Huybregts (2009):
Hybrid chains in Irish (Pattern 1 and 2; (4a,b)) receive an analysis in a derivational theory (such as the Minimalist Program [MP]) but they can hardly be accounted for in syntactic theories that are representational (such as LFG or HPSG).

Note:
For an account of hybrid chains within LFG see Asudeh (2004).

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[∅]
  b. aN ↔ C[EPP]
  c. aL ↔ C[EPP,OP]

Assumption/consequence:
- Both relative pronouns ('operators') and resumptive pronouns are empty elements of the same type: *pro*.
- One and the same *pro* can serve both as an operator and as a resumptive pronoun within a derivation.

(7) [$_{CP}$ aL . . . [$_{CP}$ aN . . . pro]]
  ① [$_{CP}$ C . . . pro] → Merge *op*
  ② [$_{CP}$ *op*$_i$ aN . . . pro$_i$] → Merge higher C
  ③ [$_{CP}$ C . . . [$_{CP}$ *op*$_i$ aN . . . pro$_i$]] → Move *op*
  ④ [$_{CP}$ *op*$_i$ aL . . . [$_{CP}$ t$_i$ aN . . . pro$_i$]]

Comments:
① → ②: Merge introduces *op* in SpecC of the lower CP, which binds a resumptive pronoun. Merge is triggered by bare [EPP] on the lower C (signalled by aN).

③ → ④: The same *op* undergoes movement, triggered by an Agree-relation between *op* and [OP] on the higher C, at the same time satisfying [EPP] on the higher C (coocurrence of [OP] and [EPP] on C being signalled by aL).

(8) $[_{CP}$ aN … $[_{CP}$ aL … t]]

①	$[_{CP}$ C … op_i] →	Move *op*
②	$[_{CP}\ op_i$ aL … t_i] →	Merge higher C
③	$[_{CP}$ C … $[_{CP}\ op_i$ aL … t_i]] →	Merge *op*
④	$[_{CP}\ op_i$ aN … $[_{CP}\ op_i$ aL … t_i]]	

Comments:
① → ②: Move of *op* in the lower CP (leaving a trace) is triggered by the lower C-head, which bears both [OP] and [EPP]. (External) Merge of *op* is banned presumably because (a) both [OP] and [EPP] must be eliminated in one swoop and (b) because Agree between [OP] on C and *op* requires that C c-command *op*.
③ → ④: Merge introduces another *op* in the higher CP (triggered by [EPP] on that C-head). (Movement of the lower *op* is banned because Move must always be fed by Agree). The higher *op* can bind the lower one since the latter is a pronoun (just like any resumptive).

3 Two implementations into HPSG

Resumption:
- Following Vaillette (2002), we take resumption to involve INDEX sharing (also cf. Asudeh 2004).
- The dependency is established via a RESUMP feature, which behaves just like SLASH with respect to percolation.
- In the terminology of Pollard & Sag (1994), resumption thus qualifies as a *weak* nonlocal dependency, contrasting with *strong* dependencies, which involve identity of the LOCAL value, such as movement.
- Hybrid chains in Irish thus call for a device switching between different types of dependencies (reminiscent of the treatment of relative clauses in Pollard & Sag 1994).

3.1 *Implementation 1: Switching by designated elements*

(9) a. *Resumptive pronoun*

$$\begin{bmatrix} \textsc{synsem} & \begin{bmatrix} \textsc{local} & \begin{bmatrix} \textsc{category} & \begin{bmatrix} \textsc{head} & \textit{pron} \end{bmatrix} \\ \textsc{content} & \begin{bmatrix} \textsc{index} & \boxed{1} \end{bmatrix} \end{bmatrix} \end{bmatrix} \\ \textsc{nonlocal} & \begin{bmatrix} \textsc{inh} & \begin{bmatrix} \textsc{resump} & \{\boxed{1}\} \\ \textsc{slash} & \{\,\} \end{bmatrix} \\ \textsc{to-bind} & \begin{bmatrix} \textsc{resump} & \{\} \\ \textsc{slash} & \{\} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

b. *Trace*

$$\begin{bmatrix} \textsc{synsem} & \begin{bmatrix} \textsc{local} & \boxed{1} \end{bmatrix} \\ \textsc{nonlocal} & \begin{bmatrix} \textsc{inh} & \begin{bmatrix} \textsc{resump} & \{\,\} \\ \textsc{slash} & \{\boxed{1}\} \end{bmatrix} \\ \textsc{to-bind} & \begin{bmatrix} \textsc{resump} & \{\} \\ \textsc{slash} & \{\} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

(10) *NONLOCAL FEATURE PRINCIPLE* (Pollard & Sag 1994: 164, also cf. Levine & Sag 2003)
For each nonlocal feature, the INHERITED value on the mother is the union of the INHERITED values on the daughters minus the TO-BIND value on the head daughter.

(11) *HEAD-FILLER RULES*

a. (i) $X \to \left[\textsc{local|content|index} \quad \boxed{1}\right]$, $CP\begin{bmatrix} \textsc{inh|resump} & \{\boxed{1}, \ldots\} \\ \textsc{to-bind|resump} & \{\boxed{1}\} \end{bmatrix}$

(ii)
$$\begin{bmatrix} \textsc{dtrs} & \begin{bmatrix} \textsc{filler-dtr}\,|\,\textsc{synsem}\,|\,\textsc{local}\,|\,\textsc{cont}\,|\,\textsc{index} & \boxed{1} \\ \textsc{head-dtr}\,|\,\textsc{synsem}\,|\,\textsc{nonlocal} & \begin{bmatrix} \textsc{inh}\,|\,\textsc{resump} & \{\boxed{1}, \ldots\} \\ \textsc{to-bind}\,|\,\textsc{resump} & \{\boxed{1}\} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

b. (i) $X \to \left[\textsc{local} \quad \boxed{1}\right]$, $CP\begin{bmatrix} \textsc{inh|slash} & \{\boxed{1}, \ldots\} \\ \textsc{to-bind|slash} & \{\boxed{1}\} \end{bmatrix}$

(ii)
$$\begin{bmatrix} \textsc{dtrs} & \begin{bmatrix} \textsc{filler-dtr|synsem|local} & \boxed{1} \\ \textsc{head-dtr|synsem|nonlocal} & \begin{bmatrix} \textsc{inh|slash} & \{\boxed{1}, \ldots\} \\ \textsc{to-bind|slash} & \{\boxed{1}\} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

Morphological reflexes
- The SLASH feature is present on all intermediate nodes on the path of a unbounded dependency.
- Different morphological forms of Cs correspond to different lexical entries.
- Cs that occur in the context of movement combine with VPs that have a non-empty SLASH feature list.
- Cs that occur in the context of resumption combine with VPs with an non-empty RESUMP feature list.

(12) a. *Lexical entry of 'aL'*

$$\begin{bmatrix} \textsc{phon} & \langle aL \rangle \\ \textsc{synsem} & \begin{bmatrix} \textsc{head} & \mathrm{C} \end{bmatrix} \\ & \mathrm{VP} \\ \textsc{subcat} & \left\langle \begin{bmatrix} \textsc{inh-slash} & \textit{neset} \\ \textsc{inh-resump} & \textit{eset} \end{bmatrix} \right\rangle \end{bmatrix}$$

b. *Lexical entry of 'aN'*

$$\begin{bmatrix} \textsc{phon} & \langle aN \rangle \\ \textsc{synsem} & \begin{bmatrix} \textsc{head} & \mathrm{C} \end{bmatrix} \\ \textsc{subcat} & \left\langle \begin{bmatrix} \textsc{inh-slash} & eset \\ \textsc{inh-resump} & neset \end{bmatrix}_{\mathrm{VP}} \right\rangle \end{bmatrix}$$

c. *Lexical entry of 'go'*

$$\begin{bmatrix} \textsc{phon} & \langle go \rangle \\ \textsc{synsem} & \begin{bmatrix} \textsc{head} & \mathrm{C} \end{bmatrix} \\ \textsc{subcat} & \left\langle \begin{bmatrix} \textsc{inh-slash} & eset \\ \textsc{inh-resump} & eset \end{bmatrix}_{\mathrm{VP}} \right\rangle \end{bmatrix}$$

(13) ***Dependency switchers***

a.
$$\begin{bmatrix} \textsc{local} & \boxed{1}\begin{bmatrix} \textsc{cont} & \begin{bmatrix} \textsc{index} & \boxed{2} \end{bmatrix} \end{bmatrix} \\ \textsc{nonlocal} & \begin{bmatrix} \textsc{inh} & \begin{bmatrix} \textsc{resump} & \{\boxed{2}\} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

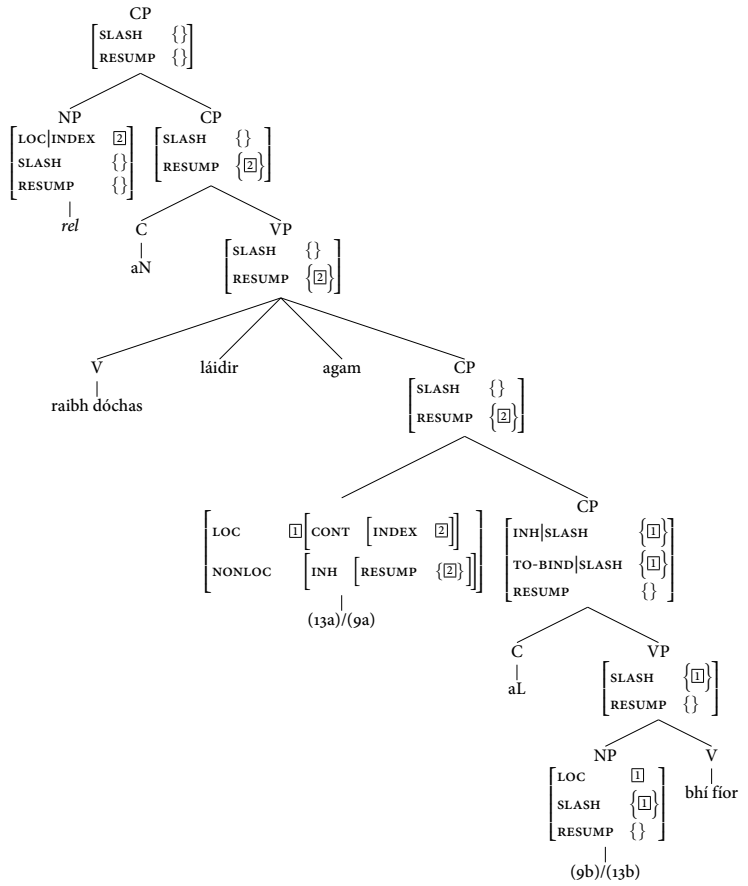
b.
$$\begin{bmatrix} \textsc{local} & \boxed{2}\begin{bmatrix} \textsc{cont} & \begin{bmatrix} \textsc{index} & \boxed{1} \end{bmatrix} \end{bmatrix} \\ \textsc{nonlocal} & \begin{bmatrix} \textsc{inh} & \begin{bmatrix} \textsc{slash} & \{\boxed{2}\} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

Note:
(13b) is simply an abbreviated entry for a trace (cf. (9a)) while (13a) is a resumptive pronoun (cf. (9b)).

3.1.1 Example 1

(14) [$_{\mathrm{CP}}$ aN . . . [$_{\mathrm{CP}}$ aL . . . t]]
rud **a** raibh dóchas láidir agam **a** _ bhí fíor
thing aN was hope strong at-me aL was true
"something that I strongly hoped was true"

(15)

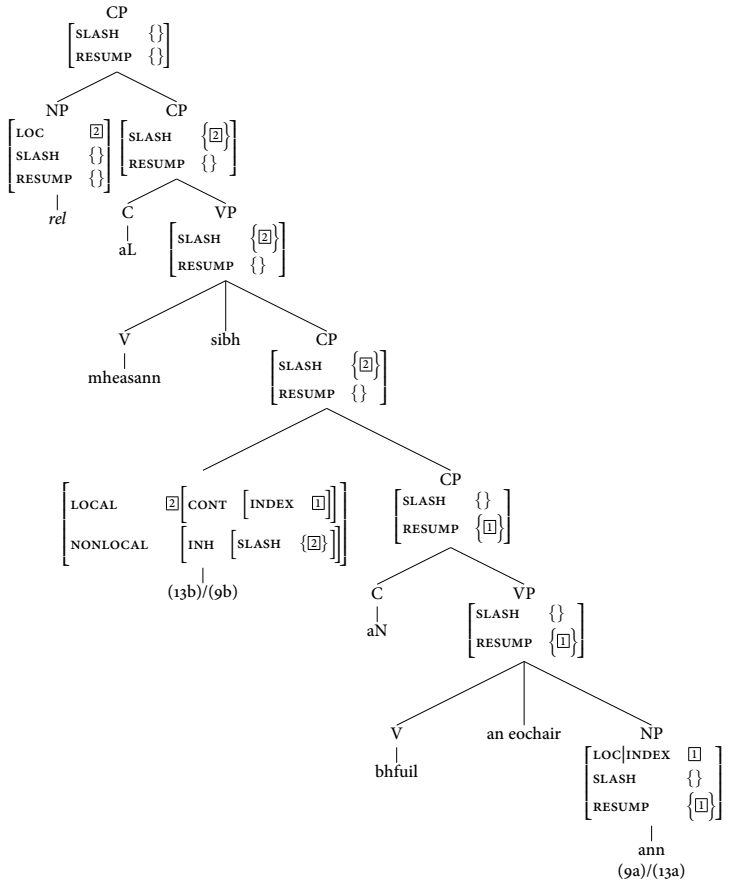


Remark:
rel in (15) is a phonologically empty relative pronoun terminating the RESUMP-dependency. Properly speaking, it initiates a REL-dependency to be bound by the head noun *rud* 'thing'. We have abstracted away from this additional step here.

3.1.2 *Example 2*

(16) [$_{CP}$ aL . . . [$_{CP}$ aN . . . pro]]
an doras **a** mheasann sibh **a** bhfuil an eochair ann
the door aL think you aN is the key in.it
"the door that you think the key is in"

(17)



3.2 *Implementation 2: Generalized switching*

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*.
- SLASH features are introduced by lexical heads via the rule in (18) and percolated by the *Slash Inheritance Principle* in (19) (both adapted from Bouma et al. 2001: 20).
- PERC is a feature whose value is of type *local* or *index*.
- By (18b), 1 and 2 in (18a) might mismatch.

(18) *Slash Amalgamation*

a. $word \Rightarrow \begin{bmatrix} \text{LOC} & \left[\text{DEPS} \left[\text{SLASH} \left\{\left[\text{PERC} \ \boxed{1}\right], \ldots\right\}\right]\right] \\ \text{SLASH} & \left\{\left[\text{PERC} \ \boxed{2}\right], \ldots\right\} \end{bmatrix}$

b. $\boxed{1}\left[\text{CONT}|\text{INDEX} \ \boxed{2}\right]$
$\vee \ \boxed{2}\left[\text{CONT}|\text{INDEX} \ \boxed{1}\right]$
$\vee \ \boxed{1} = \boxed{2}$

(19) *Slash Inheritance*

$hd\text{-}val\text{-}ph \Rightarrow \begin{bmatrix} \text{SLASH} & \left\{\left[\text{PERC} \ \boxed{1}\right]\right\} \\ \text{HD-DTR} & \left[\text{SLASH} \left\{\left[\text{PERC} \ \boxed{1}\right]\right\}\right] \end{bmatrix}$

3.3 *Comparison: Punctuated vs. uniform paths*

- The first implementation (involving designated switching elements) is *punctuated* (Abels & Bentzen to appear): Switching is possible in distinguished positions only – those that allow to generate a switching element (13).
- The second possibility (slash amalgamation) is *uniform*: Switching is in principle available at any phrasal level (by (18)).
- If paths are uniform, an island boundary may be crossed via a RESUMP-dependency.
- Immediately above the island boundary, but still below the next higher C head, RESUMP could be turned into SLASH and percolated to the next C.
- This generates *aL* right above the island. Empirically, only *aN* is possible.

⇒ Punctuated paths are to preferred empirically; rendering implementation 1 the superior one.

4 Outlook and discussion

Note:

- In principle, any of the two analyses developed above generates structures involving a change from one type of dependency towards another one and back again (20a,b).
- Empirically, it is not clear whether this is possible or not.

(20) *Double-flick chains*

a. [$_{CP}$ aL . . . [$_{CP}$ aN . . . [$_{CP}$ aL . . . t]]]

b. $[_{CP}$ aN ... $[_{CP}$ aL ... $[_{CP}$ aN ... pro]]]

Remark:
This prediction is shared by McCloskey's (2002) account, as illustrated in (21).

(21) *Derivation of (20a)*

①	$[_{CP}$ op_i aN ... $[_{CP}$ op_i aL ... t_i]] →	...
②	$[_{CP}$ C ... $[_{CP}$ op_i aN ... $[_{CP}$ op_i aL ... t_i]]] →	Move *op*
③	$[_{CP}$ op_i aL ... $[_{CP}$ t_i aN ... $[_{CP}$ op_i aL ... t_i]]]	

(22) *Derivation of (20b)*

①	$[_{CP}$ op_i aL ... $[_{CP}$ t_i aN ... pro_i]] →	...
②	$[_{CP}$ C ... $[_{CP}$ op_i aL ... $[_{CP}$ t_i aN ... pro_i]]] →	Merge *op*
③	$[_{CP}$ op_i aN ... $[_{CP}$ op_i aL ... $[_{CP}$ t_i aN ... pro_i]]]	

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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