

# **Analysing Complex Predicates in LFG with Distributive Attributes**

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# Outline

- 1 **Background**
- 2 Today's Solution
- 3 An Issue of Stipulation
- 4 And we need a linking theory
- 5 Conclusion

## Andrews and Manning 1999 (AM99)

- 1 Analyses of a range of 'complex predicate' constructions
  - a Romance restructuring (clause union) & Urdu 'light' verbs'
  - b Tariana SVCs
  - c Misumalpan Causatives
- 2 The analyses were coherent and worked, but:
  - a. The framework was hard to understand
  - b. and also to apply to additional phenomena
  - c. so not much followon work happened
  - d. e.g. the treatment of modal/scoping adjectives in Andrews and Manning (1993) did not manage to get carried over.
- 3 Furthermore, the rather drastic modifications that AM99 made to LFG caused some unintended damage, such as 'breaking' inside-out functional uncertainty (Andrews 2001).

## Differential Attribute Spreading

- 1 Basic idea of AM99 framework: spread attributes in different ways thru a feature-structure of an f-structure
- 2 A major motivation:
  - a te        los        quiero mostrar  
you(D) them(A) I want to show  
I want to show them to you  
(clitic climbing; Spanish, Aissen and Perlmutter 1976)
  - b El    mestre    fa        llegir un poema al        nen  
the teacher causes read a poem to.the boy  
the teacher makes the boy read a poem  
(GR-'scrunching' in the Causative; Catalan, Alsina 1997)
- 3 In both cases, grammatical relation seem to spread across two levels of a semantically complex structure, while verbal form features stay put.

## Issues for LFG

- ❶ Evidence for Clause Union = evidence for a one-level f-structure, but:
- ❷ Each verb seems to impose marking on its own 'semantic complement'
- ❸ Semantic Interpretation seems to 'respect the tree' (Catalan; Alsina 1997):
  - a. Li            acabo de fer    llegir la    carta  
Him.DAT I.finish of make read the map  
I finish making him read the map.
  - b. Li            faig    acabar de llegir la    carta  
Him.DAT I.make finish of read the map  
I make him finish reading the map.
  - c. La    faig    acabar de llegir al    nen  
It.F I.make finish of read to the boy  
I make the boy finish reading it (say, a map ([GND FEM])  
(full clitic climbing; Alsina p.c)

## A Delayed Realization

- 1 Basic idea of LFG treatment of coordinate structures: spread attributes in different ways between the conjuncts and entirety of a coordinate structure
- 2 LFG coordinate structures plus a dab of glue semantics deals with Tariana (Andrews 2010 ALS talk)
- 3 Glue semantics without spreading games can manage Misumalpan (not covered here, but see lingbuzz 'Sets, Heads and Spreading in LFG' (2015))

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- 4 The most developed idea of LFG coordinate structures, 'hybrid objects' can do a pretty good job with 'restructuring' predicates (glue not really needed)

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## Hybrid Objects: Sets and Nondistributive Attributes

José y yo  
(DK2000)  
(John Maxwell)

$$\left[ \begin{array}{l} \left\{ \begin{array}{l} \left[ \begin{array}{ll} \text{PRED} & \text{'José'} \end{array} \right] \\ \left[ \begin{array}{ll} \text{PERSON} & 3 \end{array} \right] \\ \left[ \begin{array}{ll} \text{NUM} & \text{SG} \end{array} \right] \end{array} \right\} \\ \left\{ \begin{array}{l} \left[ \begin{array}{ll} \text{PRED} & \text{'Pro'} \end{array} \right] \\ \left[ \begin{array}{ll} \text{PERSON} & 1 \end{array} \right] \\ \left[ \begin{array}{ll} \text{NUM} & \text{SG} \end{array} \right] \end{array} \right\} \\ \left[ \begin{array}{ll} \text{PERSON} & 1 \end{array} \right] \\ \left[ \begin{array}{ll} \text{NUM} & \text{PL} \end{array} \right] \end{array} \right]$$

The coordinate NP is a hybrid object, consisting of a set of members and some attributes. PRED, PERSON and NUM are 'nondistributive' attributes. These sit inertly in whatever f-(sub)structure they are introduced into.

## Distributive Attributes

Distributive attributes however spread, such as CASE:

- 1 Mary and I/?me left
- 2 He saw Mary and me/\*I

- 3
 
$$\left[ \begin{array}{l} \left[ \begin{array}{l} \text{PRED 'María'} \\ \text{PERSON 3, NUM SG=} \\ \text{CASE NOM/ACC} \end{array} \right] \\ \left[ \begin{array}{l} \text{PRED 'Pro'} \\ \text{PERSON 1, NUM SG} \\ \text{CASE NOM/ACC} \end{array} \right] \\ \text{PERSON 1, NUM PL} \\ \text{CASE NOM/ACC} \end{array} \right]$$

## Distribution Convention

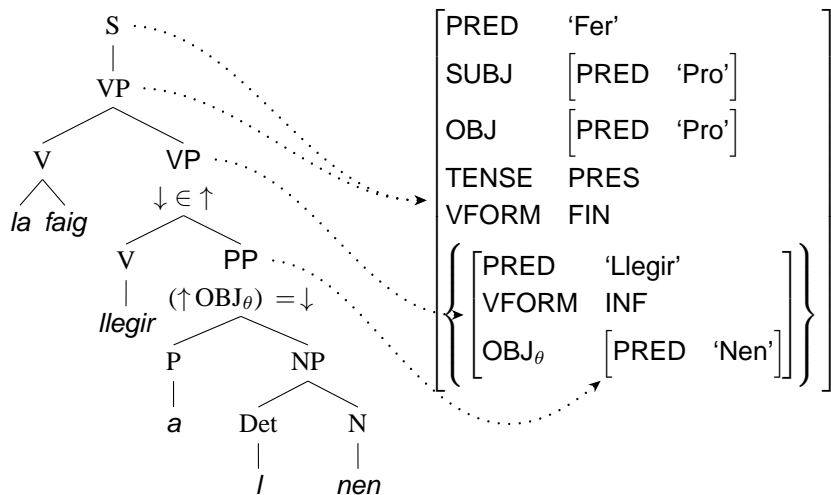
Spreading of distributive attributes is somewhat similar but not identical to what was proposed by Andrews and Manning.

- 1 For any distributive attribute  $A$  and set  $s$ ,  $A(s) = V$  iff  $\forall f \in s, A(f) = V$  (Dalrymple 2001:158; differs slightly from DK:73).
- 2 Meaning 1: If a distributive attribute is attributed to the whole structure, it will automatically propagate to the members.
- 3 Meaning 2: If one is specified identically for all of the daughters, it will likewise apply to the whole.
- 4 Nondistributive attributes (e.g. NUM and PERSON) often have 'resolution' rules, for computing a value for the hybrid from those of the components (MASC+FEM=MASC in Greek NEUT in Icelandic), are also often set 'semantically' (hard problem, but not mine, here).

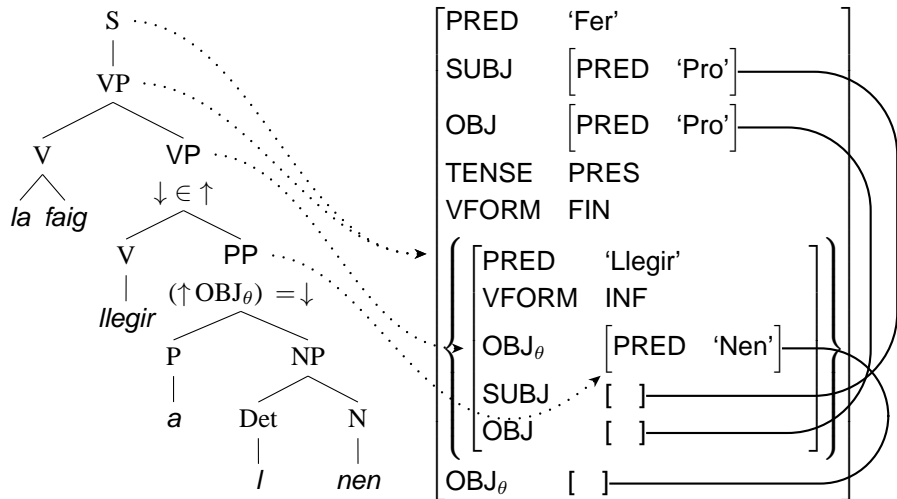
## Realization (embarrassingly delayed)

- 1 A set can have one member, therefore,
- 2 'Hybrid Objects' (invented by John Maxwell) and distributive/nondistributive attributes (Kaplan and Dalrymple) can implement most of the analyses of Andrews and Manning 1999,
- 3 Grammatical Relations already have to be distributive to deal with *John likes and admires Mary*, etc. (Dalrymple 2001)
- 4 There are some issues, including some with certain morphological features, and with linking, but these can be managed (I claim).

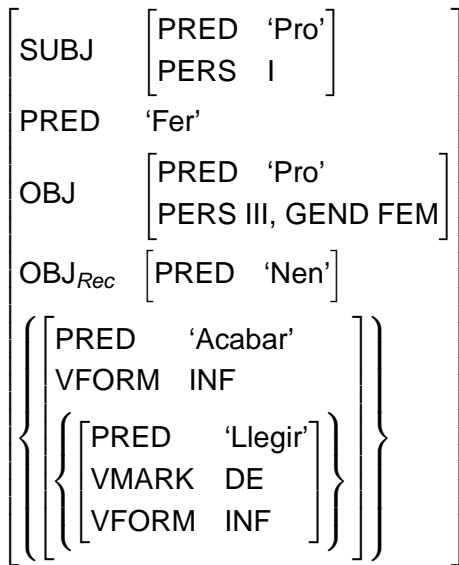
## An Example *la faig llegir al nen*



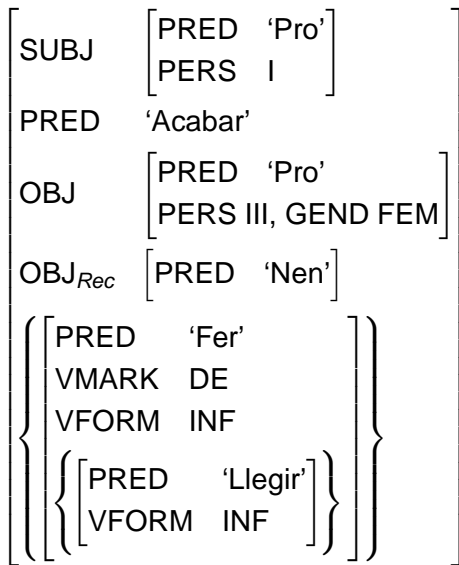
## An Example *la faig llegir al nen*



*La faig acabar de llegir al nen* (**I make the boy stop reading it**)



*La acabo de fer llegir al nen* (**I stop making the boy stop read it**)





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## A slight problem

In coordinate structures, VFORM and VMARK are distributive:

- 1 acabà de riure i (de) plorar  
finish.PAST.3SG VM laugh.INF and (VM) weep.INF  
He/she stopped laughing and crying
- 2 Quan acabis de llegir l'article i (de) fer-ne el  
When finish.2SG VM read.gfINF the-article and (VM) make-of it the  
resum, avisa'm  
summary, advise-me  
When you finish reading the article and summarizing it, let me know.
- 3 La Maria està rient i plorant  
the Mary is laughing and crying
- 4 La Maria ha rigut i plorat  
the Mary has laughed and cried  
(Alsina p.c.)

## A mildly stipulative solution

- 1 All attributes except a few specified ones such as PRED and ADJUNCTS are distributive.
- 2 But, in specific constructions, certain attributes can be specified explicitly as not distributed ('undersharing')
- 3 We can use the same notation as for 'restriction' (Dalrymple 2001:162-163):

$$\begin{array}{ccccc}
 \text{VP} & \rightarrow & \text{V} & & \text{VP} \\
 & & & & \downarrow \in \uparrow \\
 & & & & \text{/VFORM, VMARK}
 \end{array}$$

- 4 Likewise, Person and Number will be undershared in coordinate structures.
- 5 We can probably use undersharing to do most of the things for which restriction is (occasionally) proposed.

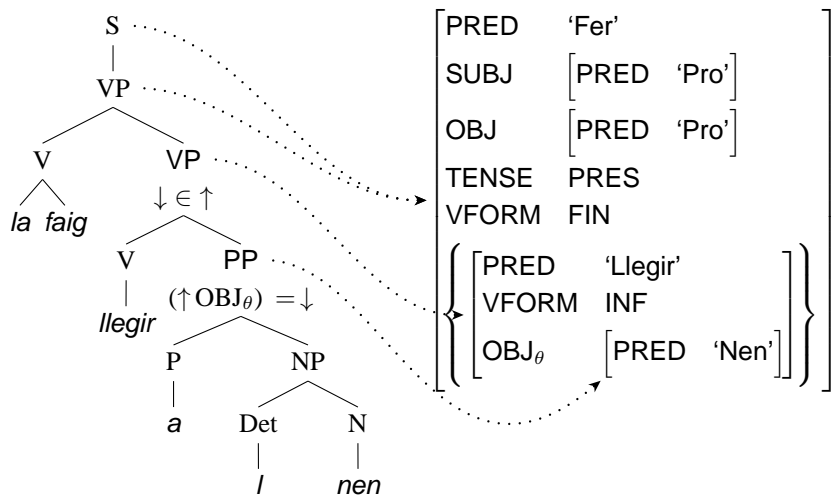
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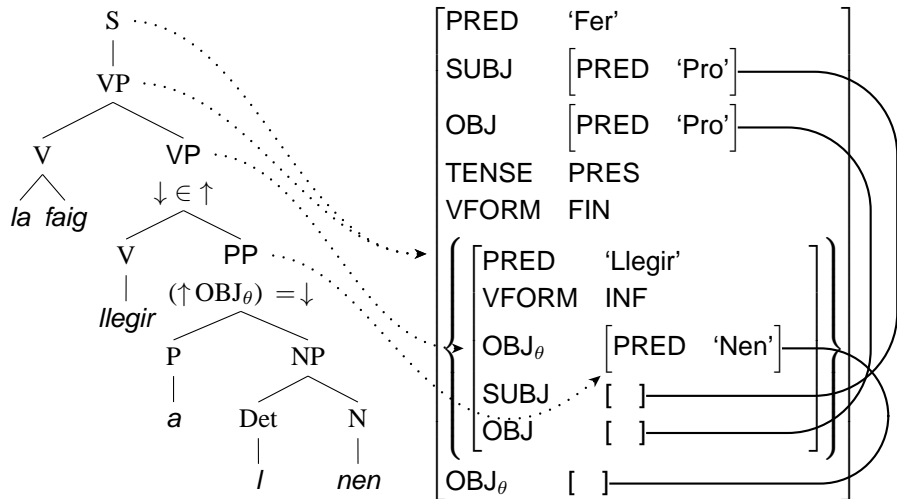
## A more substantial problem: Linking

- 1 For the commonest cases (aspectual and modal auxiliaries), nothing overt happens.
- 2 For causatives, there is however the famous transitivity-based alternation (Catalan; Alsina 1996:185,190)..(d) has the appearance of a ditransitive with Causee Agent  $\sim$  Recipient:
  - a. El nen treballa molt  
the boy works a lot
  - b. Fas treballar molt el nen  
You make work(INF) a lot the boy
  - c. El nen llegeix un poema  
The boy reads a poem
  - d. El mestre fa llegir un poema al nen  
The teacher makes read(INF) a poem to the boy

## But what about the SUBJ?



## But what about the SUBJ?



## TERMS lists (AM99, Manning 1996); PREDs like Alsina (1996)

- 1 
$$\left[ \begin{array}{ll} \text{PRED} & \text{'Cause(X, Y, P)'} \\ \text{TERMS} & [X, Y \mid Z] \\ & \left\{ \left[ \begin{array}{ll} \text{PRED} & \text{'P'} \\ \text{TERMS} & [Y \mid Z] \end{array} \right] \right\} \end{array} \right]$$
- 2 
$$\left[ \begin{array}{ll} \text{PRED} & \text{'Read(U, W)'} \\ \text{TERMS} & [U, W] \end{array} \right]$$



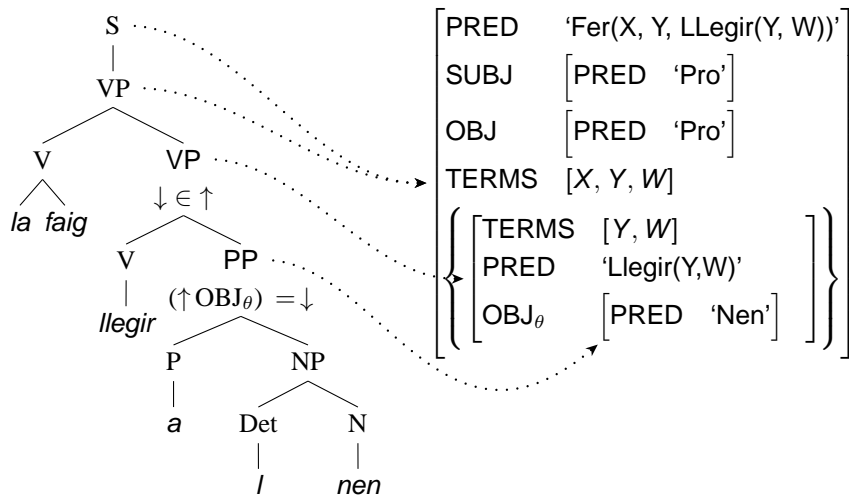
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- 4 
$$\left[ \begin{array}{ll} \text{PRED} & \text{'Cause(X, Y, P)'} \\ \text{TERMS} & [X, Y, Z] \\ & \left\{ \left[ \begin{array}{ll} \text{PRED} & \text{'Read(Y, Z)'=P} \\ \text{TERMS} & [Y, Z] \end{array} \right] \right\} \end{array} \right]$$

## Before Linking *la faig llegir al nen* (Sharing not represented)



## Linking Rules

$$\left[ \begin{array}{ll} \text{PRED} & \text{'Fer(X,Y, 'Llegir(Y,Z))'} \\ \text{SUBJ} & \left[ \text{PRED} \quad \text{'Pro'} \right] \\ \text{OBJ} & \left[ \text{PRED} \quad \text{'Pro'} \right] \\ \text{TERMS} & [X, Y, Z] \\ \left\{ \begin{array}{ll} \left[ \text{TERMS} & [Y, Z] \right. \\ \left[ \text{PRED} & \text{'Llegir(Y,Z)'} \right. \\ \left[ \text{OBJ}_\theta & \left[ \text{PRED} \quad \text{'Nen'} \right] \right. \end{array} \right\} \end{array} \right]$$

- 1 All TERMS-list positions must be linked to a GR.
- 2 Highest can be SUBJ
- 3 Lowest can be OBJ
- 4 Non-highest can be  $\text{OBJ}_\theta$  (prespecified for 'semitransitives')
- 5 OBJ is preferable to  $\text{OBJ}_\theta$

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## Romance Clause Union Predicates

can be analysed

- 1 with a more restrained version of LFG
- 2 whose only true extension over the framework Dalrymple 2001 is 'undersharing'
- 3 although we have here explored a different possibility for linking than standard LMT
- 4 but versions of that can also be considered

## Appendix

Slides, references and current and upcoming versions of the paper at:

`AveryAndrews.net/Papers/ALS2015`

## Linking Definitions

PRED	'Fer(X,Y, 'LLegir(Y,Z)')'
SUBJ	[PRED 'Pro']
OBJ	[PRED 'Pro']
TERMS	[X, Y, Z]
$\left\{ \begin{array}{l} \left[ \begin{array}{ll} \text{TERMS} & [Y, Z] \\ \text{PRED} & \text{'Llegir(Y,Z)'} \\ \text{OBJ}_\theta & [\text{PRED 'Nen'}] \end{array} \right] \end{array} \right\}$	

1 Highest:

$\neg(\text{REST HEAD} \uparrow)$

2 Lowest:

$\neg((\text{HEAD} \uparrow) \text{ REST HEAD})$

A lot of material to work through has accumulated in various frameworks since 1999 that's relevant to finding the best way of doing this (!!)