

Syntactic Change as Calcifying Pragmatic Strategies  
The Person Case Constraint as a Tree-Logic Consequence  
Language as an Evolving System

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<http://www.kcl.ac.uk/research/groups/ds>

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## The Challenge of Morphology

- Why do clitics cluster?
- Why are there gaps in clitic paradigms so that some clitic combinations do not occur?
- Gaps in clitic cluster paradigms lack syntactic/semantic explanation, and warrant a morphology component?
- Dynamic Syntax: clitics as a calcification of processing strategies:
  - Individual clitics display one option from alternative update strategies
  - Set of clitic actions constitutes the full range of local alternative strategies
  - Account confirmed by application of tree-logic constraint to explain morphological gaps
  - Account buttressed by individual emergent polysemies to explain counter-examples
  - The account is inexpressible without invocation of on-line processing dynamics
- Reflections on language as an evolving mechanism for coordinative interpretation

## The Person Case Constraint Challenge

- Clitic clustering is a mystery
- Some combinations recur on a very broad cross-linguistic basis BUT
- Some languages don't display at least part of the restriction
- Is this just a vagary of cultural usage?  
We never talk very much about giving/selling people to people
- If it is something deeper, it doesn't seem to be semantic  
(all strong pronoun combinations possible)  
but it doesn't seem to be syntactic either
- The constraints have been used to motivate features  
but this is simply because a feature-geometry has to be stipulated  
to account for the data at all
- No obvious interaction with general structural processes

## From Latin to Clitic Clusters

- (1) *Et los dioses me quisieron mal e me lo quieren*  
 And the gods CL want<sub>3pl</sub> harm and CL CL want<sub>3pl</sub>  
 and the gods wanted to harm me and they still want to  
[CONJ+pron.x2]  
(XIII; cited by Granberg 1988: 235-236)
- (2) *Qui-d nos dio por alcalde?*  
 Who<sub>CL.2.ps</sub> CL<sub>1st.pers.pl</sub> gave<sub>3sg</sub> as mayor  
 Who gave you to us as mayor? [WH+pron.x2]  
(XIII: Fazienda de Ultramar)

- The questions clitics raise:
  - To what extent is clitic placement unlike other noun phrases –  
 Answer: routinised early positioning, originally like full NP-placement though encoded, subsequently not.
  - Why do clitics cluster?
  - Why are there language-particular orderings?

## The Person Case Constraint

- For any clitic combination, if the first/second person is in the dative, NO 3rd person accusative clitic pronoun is possible
- For any clitic combination, first and second person clitic combination often precluded
- Spanish conforms to one of the constraints only:

How can this be so? Maybe it isn't a linguistic fact?

Given a tree-growth perspective,  
what aspect of the process could explain

- (a) clitic clustering,
- (b) constraints on clitic clusters,
- (c) exceptions to any such constraints

Answer:

The constraint of only one unfixed node at a time,  
reflected in routinised tree-growth actions, hence  
affecting ONLY actions inducing an unfixed tree-relation  
The emergence of homonymy provides a get-out clause

How can that be?.....

## Defining the growth in language processing

**LOFT (Logic of Finite Trees)** (Blackburn and Meyer-Viol 1994)

- $\langle \downarrow_0 \rangle X$  X holds at argument daughter of some tree-node  $n$  ( $Tn(n)$ ).
- $\langle \downarrow_1 \rangle X$  X holds at functor daughter of  $Tn(n)$ .
- $\langle \uparrow \rangle X$  X holds at mother of  $Tn(n)$ .
- $\langle \downarrow_* \rangle X$   $Tn(n)$  dominates  $X$ .
- $\langle \uparrow_* \rangle X$   $Tn(n)$  is dominated by  $X$ .
- $\langle L \rangle X$  the LINK relation (between nodes in distinct trees)
- $\langle L^{-1} \rangle X$  the inverse LINK relation.

Requirements:  $?X$  for any  $X$  including modal statements – requirements on future developments eg accusative case  $? \langle \uparrow_0 \rangle Ty(e \rightarrow t)$

Any node only characterised as  $\langle \uparrow_* \rangle Tn(a), ?\exists x Tn(x)$  will be “unfixed”:

$Tn(a), ?Ty(t)$

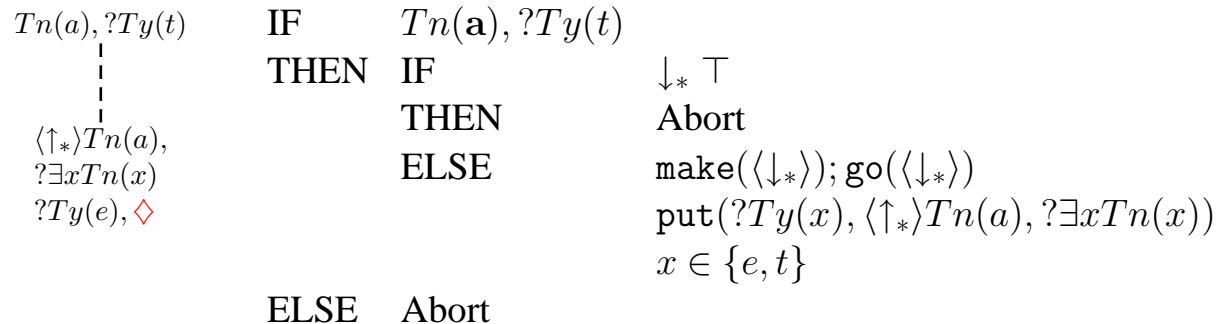
⋮

$\langle \uparrow_* \rangle Tn(a),$   
 $? \exists x Tn(x), \diamond$

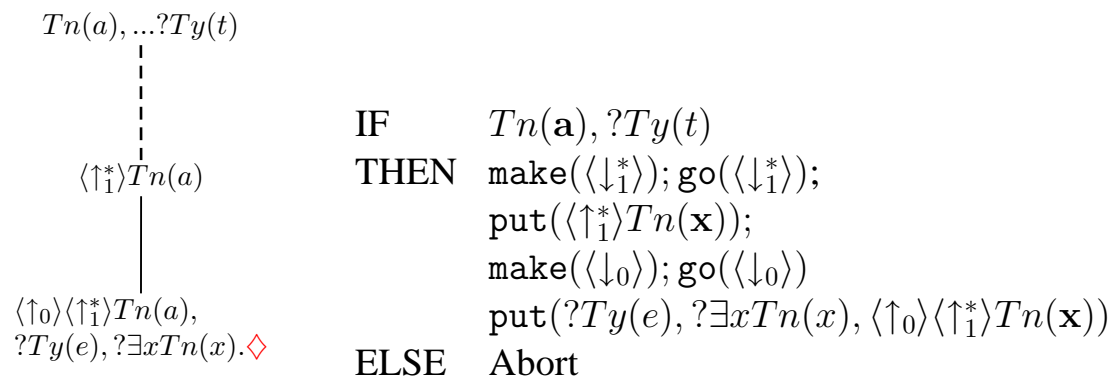
Only 1 unfixed node (of a type) from given node as nodes with same modality necessarily collapse (are the same node).

## Two Ways to Update a Structure (analogous to Binding Principles)

(i) \* Adjunction - update within single tree



(ii) Local \* Adjunction (update required within minimal propositional unit)



## The clue lies in the tree-updates involved in “Scrambling”

- Non-local Word Order Variation (case as output filter)

(3) *Stercilinum magnum stude ut habeas*  
 Dunghill<sub>ACC</sub> big<sub>ACC</sub> ensure<sub>IMP</sub> that have<sub>2.ps.sing.</sub>  
 See that you have a large dung hill

(4) *Caseum per cribrum facito transeat in mortarium*  
 Cheese<sub>ACC</sub> through sieve make<sub>IMP</sub> cross into the bowl  
 Make the cheese go through the sieve into the bowl.

(5) *digitum supra terram facito semina emineant*  
 finger<sub>ACC</sub> above earth<sub>ACC</sub> make<sub>IMP</sub> seeds<sub>NOM</sub> project<sub>3.pl.</sub>  
 Make the seeds project a finger above the earth.

- Local Word Order Variation (constructive use of case)

(6) *Ob id, Aelium Thurini statua et corona aurea donarunt* Pliny p.49

On account of this, the Thurini presented Aelius with a statue and gold crown

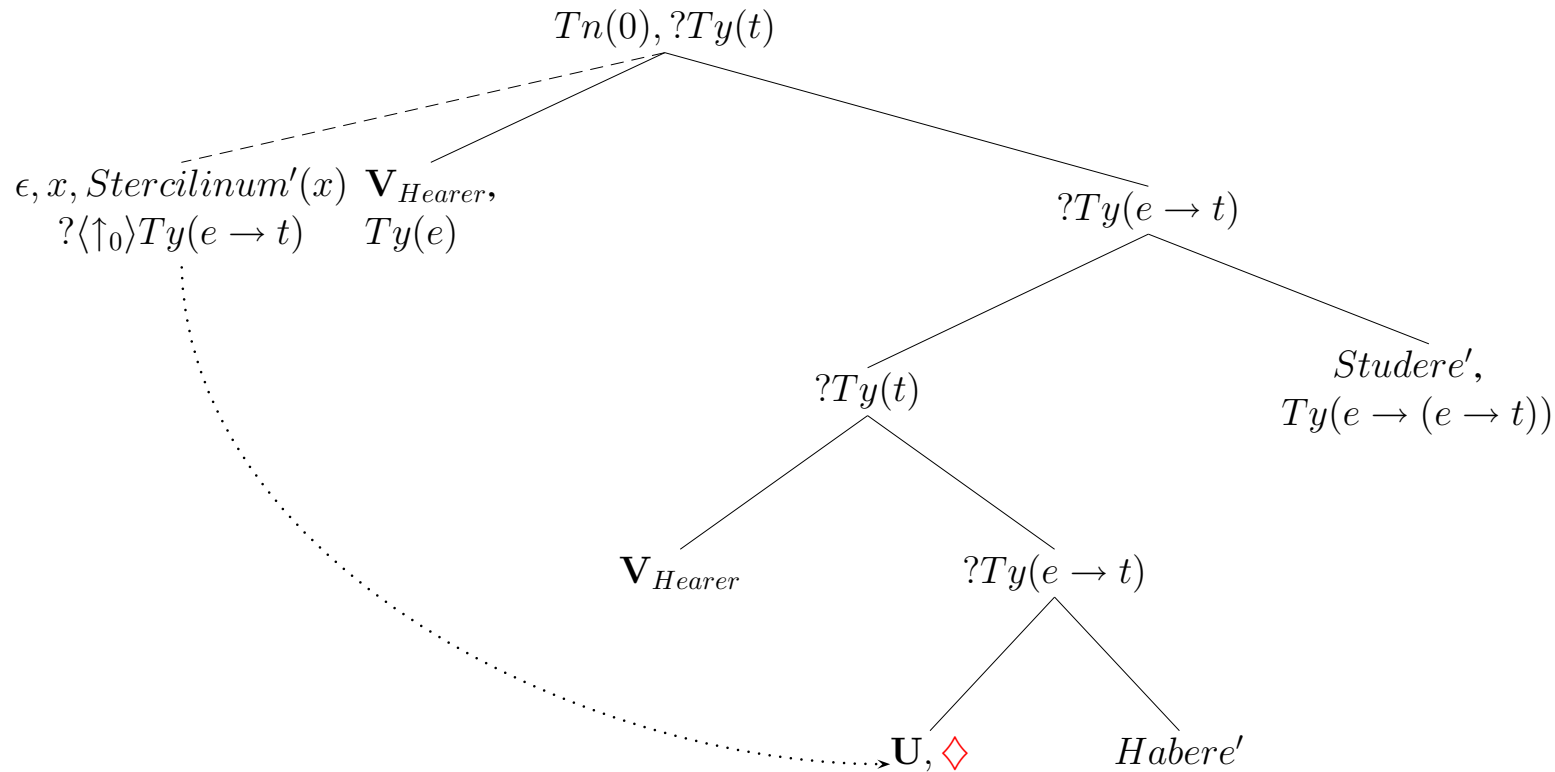
- Use of linked structures for “ethical” datives:

(7) *te Dea te fugiunt venti*  
 you<sub>DAT</sub> Goddess<sub>VOC</sub> you<sub>DAT</sub> flee winds<sub>NOM</sub>  
 ‘You, Goddess, you, the winds flee from’

### (i) Case as output filter

- (3) *Stercilinum magnum stude ut habeas*  
 Dunghill large strive<sub>Imp</sub> that have<sub>2.sg.Subjunct</sub>

Ensure that you have a large dunghill



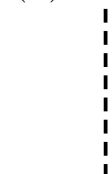
## (ii) Constructive use of case: updating locally unfixed node

No more than one unfixed node of a type from given dominating node  
 – because nodes with the same modality **necessarily** collapse (are the same node)

Case used to fix underspecified treenode relations on the fly.

Processing *Praemium Xerxes proposuit* ( ‘Xerxes offered a reward’)

$Tn(0), \dots ?Ty(t),$



$\langle \uparrow_1^* \rangle Tn(0)$



$\langle \uparrow_0 \rangle \langle \uparrow_1^* \rangle Tn(0),$   
 $?Ty(e), \diamond$

Local \*Adjunction inducing a locally unfixed argument node

## (ii) Constructive use of case: updating locally unfixed node(2)

Parsing *Praemium Xerxes proposuit*

$Tn(0), \dots?Ty(t), \diamond$

$\langle \uparrow_1 \rangle Tn(0)$

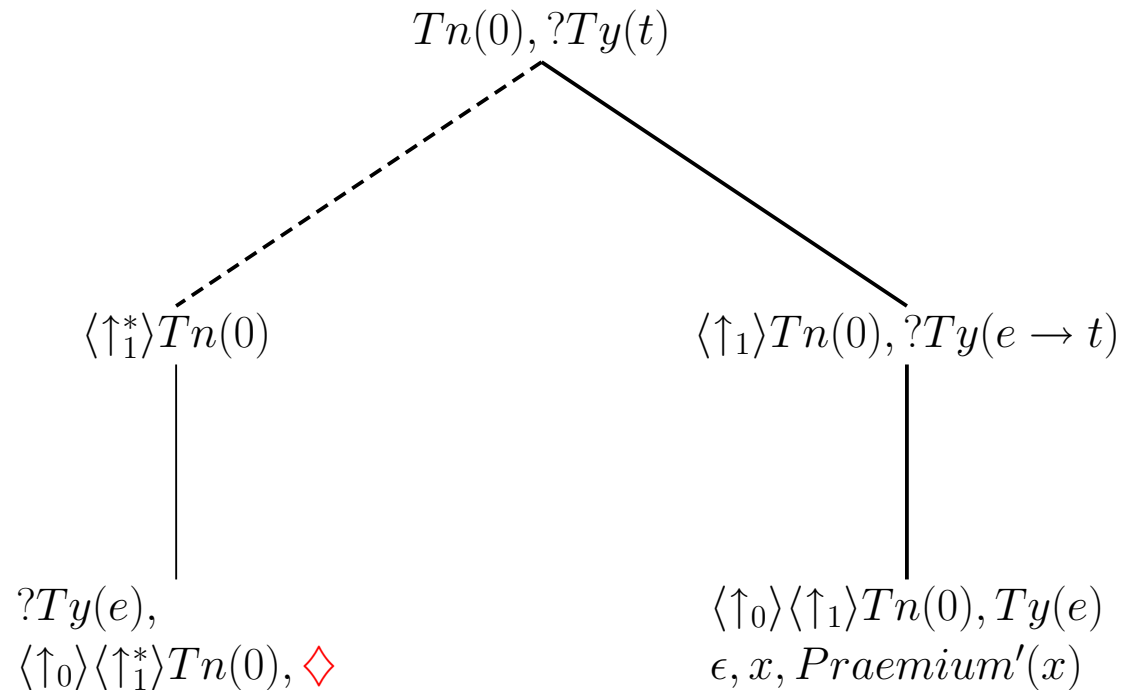
$\langle \uparrow_0 \rangle \langle \uparrow_1 \rangle Tn(0), Ty(e)$   
 $\epsilon, x, Praemium'(x)$

Processing *praemium*

Using case (and animacy) to fix argument node

## (ii) Constructive use of case: updating locally unfixed node(3)

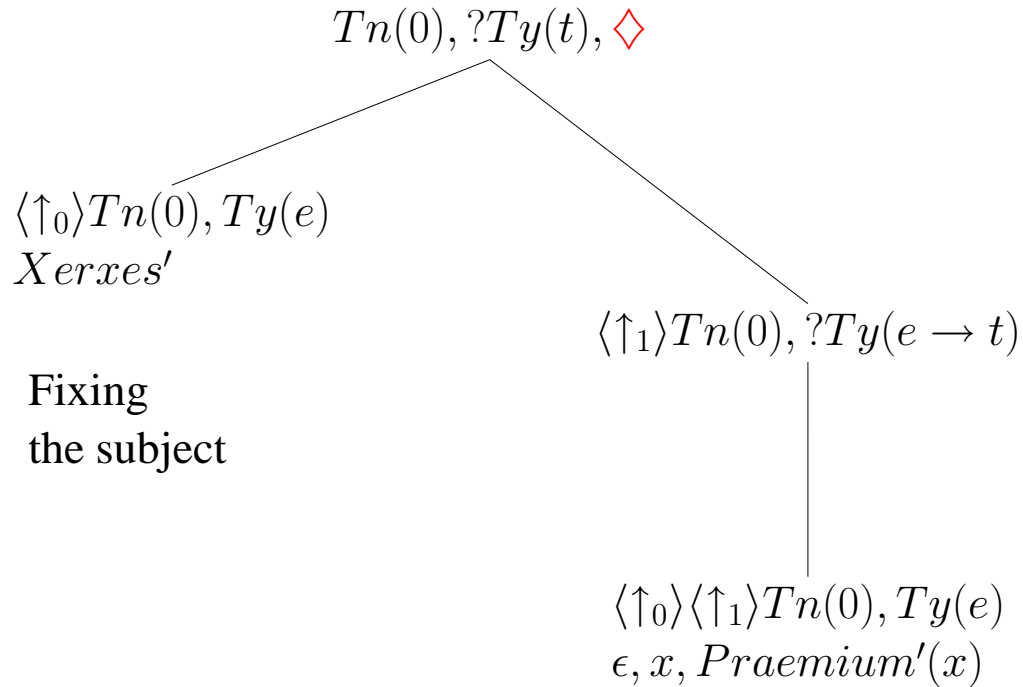
Processing *Praemium Xerxes proposuit*



Building a locally unfixed node (again)

**(ii) Constructive use of case: updating locally unfixed node(4)**

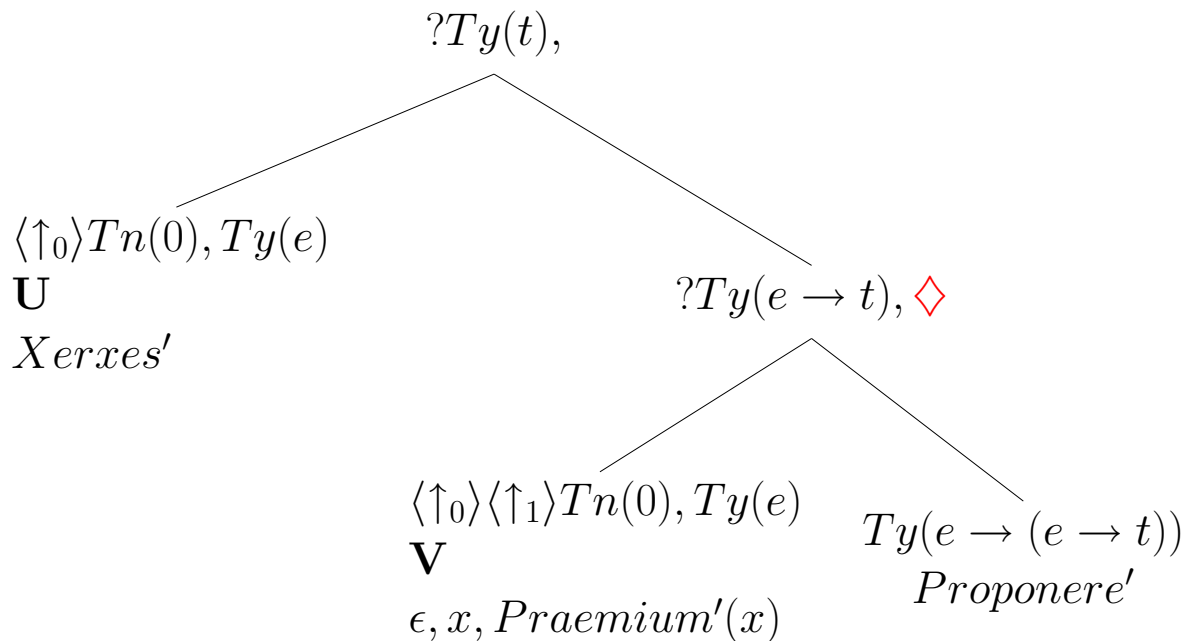
Processing *Praemium Xerxes proposuit*



Result of processing *praemium Xerxes* is a partial tree with a cluster of argument nodes

## (ii) Constructive use of case: updating locally unfixed node(5)

Processing *Praemium Xerxes proposuit*



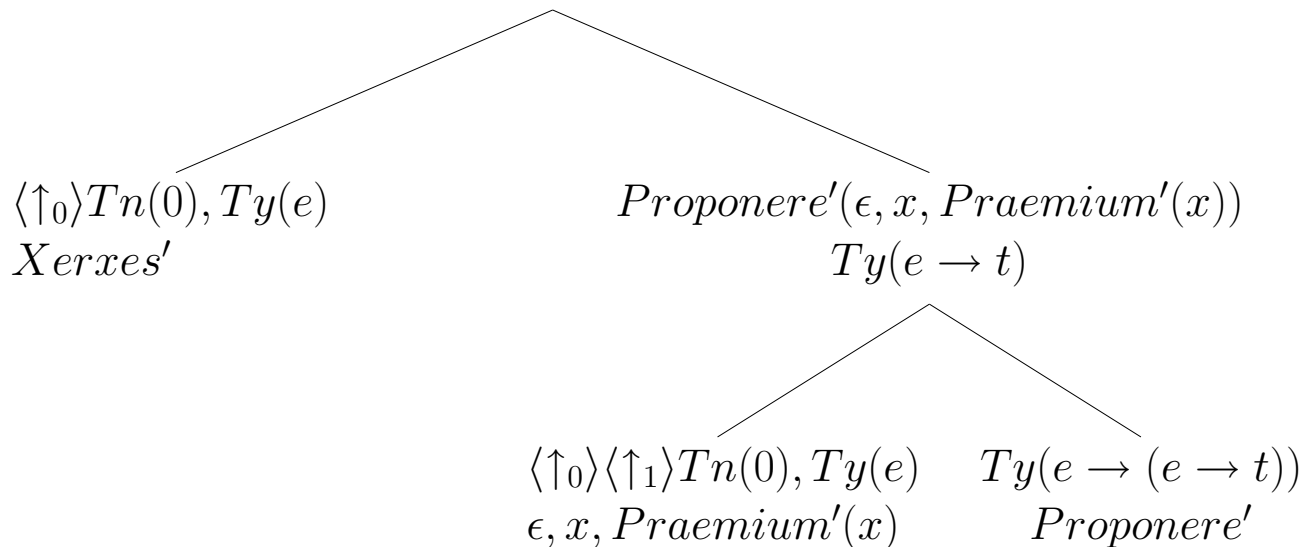
processing *proposuit*  
 (notice two operations of building subject/object collapse)

**(ii) Constructive use of case: updating locally unfixed node(6)**

Processing *Praemium Xerxes proposuit*

Deriving compositionality on resulting tree

$Ty(t), Proponere'(\epsilon, x, Praemium'(x))(Xerxes'), \diamond$



Note: never more than one unfixed node at a time

### (iii) Combining non-local and local building processes

Multiple long-distance scrambling effects in Latin as:

\*Adjunction feeding Local\*Adjunction

Building a cluster of argument nodes at an unfixed node

(8) *Caseum per cribrum facito transeat in mortarium*  
 The cheese through the sieve make cross<sub>3.ps</sub> into the bowl

Cause the cheese to go through the sieve into the bowl

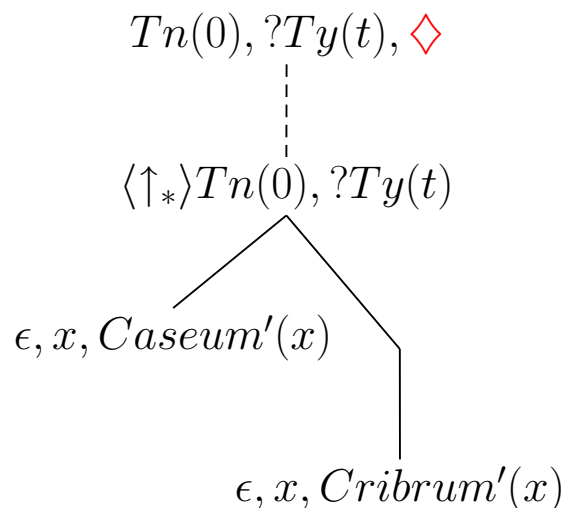
The restriction that individual items in multiple long-distance scrambling must be local to each other is predicted.

## Multiple Long-Distance Scrambling \*Adjunction + Local \*Adjunction

- (8) *Caseum per cribrum facito transeat in mortarium*  
 The cheese through the sieve make<sub>Imp</sub> go-through<sub>3.ps</sub> into the bowl

Make the cheese go through the sieve into the bowl

Combining local-scrambling and long-distance scrambling devices  
 \*Adjunction feeding Local\*Adjunction

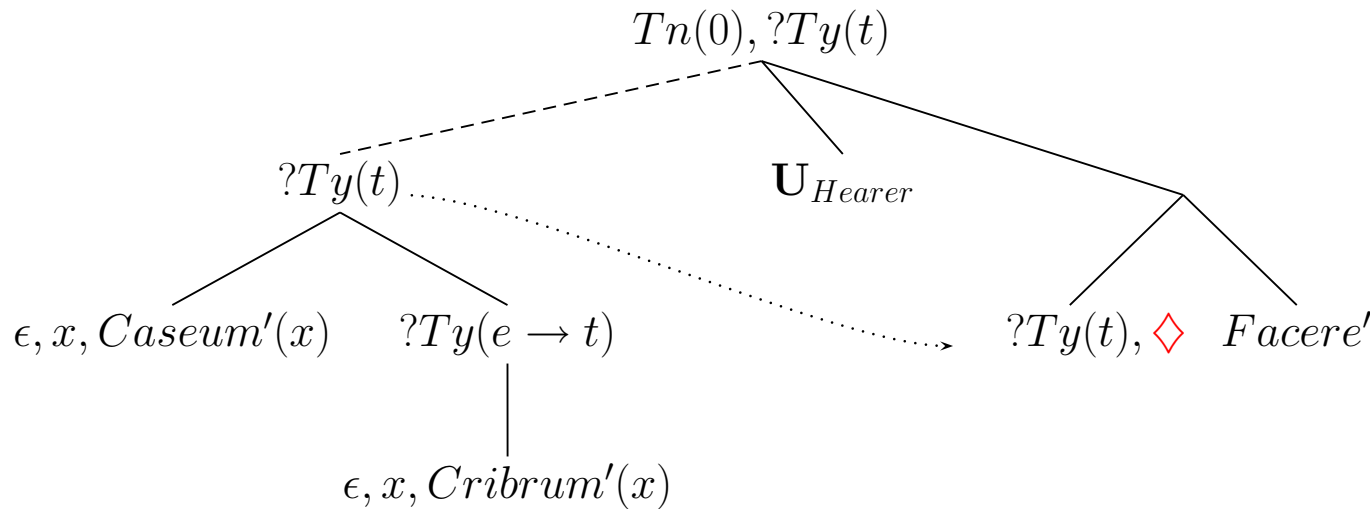


Building up a local-structure from a sequence of case-marked argument nodes, just as in local scrambling, but on an unfixed node.

## Multiple Long-distance dependency (2)

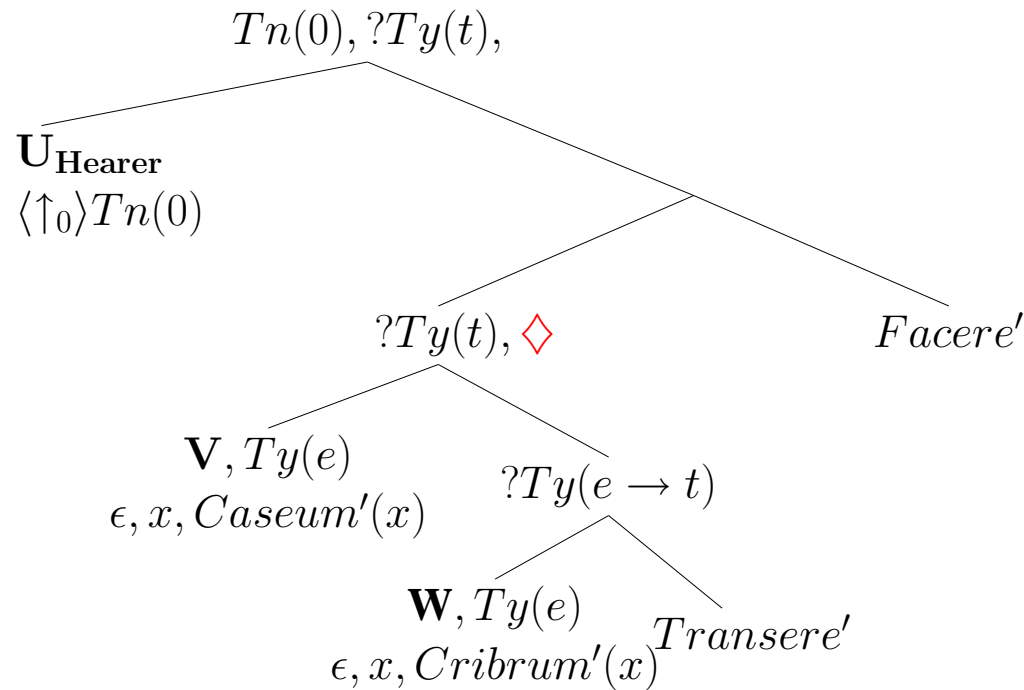
(8) *Caseum per cribrum facito transeat in mortarium*  
 The cheese through the sieve make go-through<sub>3.ps</sub> into the bowl

Cause the cheese to go through the sieve into the bowl



## Multiple Long-Distance Scrambling (3)

Unifying two partial trees:



Relative locality of two nodes an immediate consequence

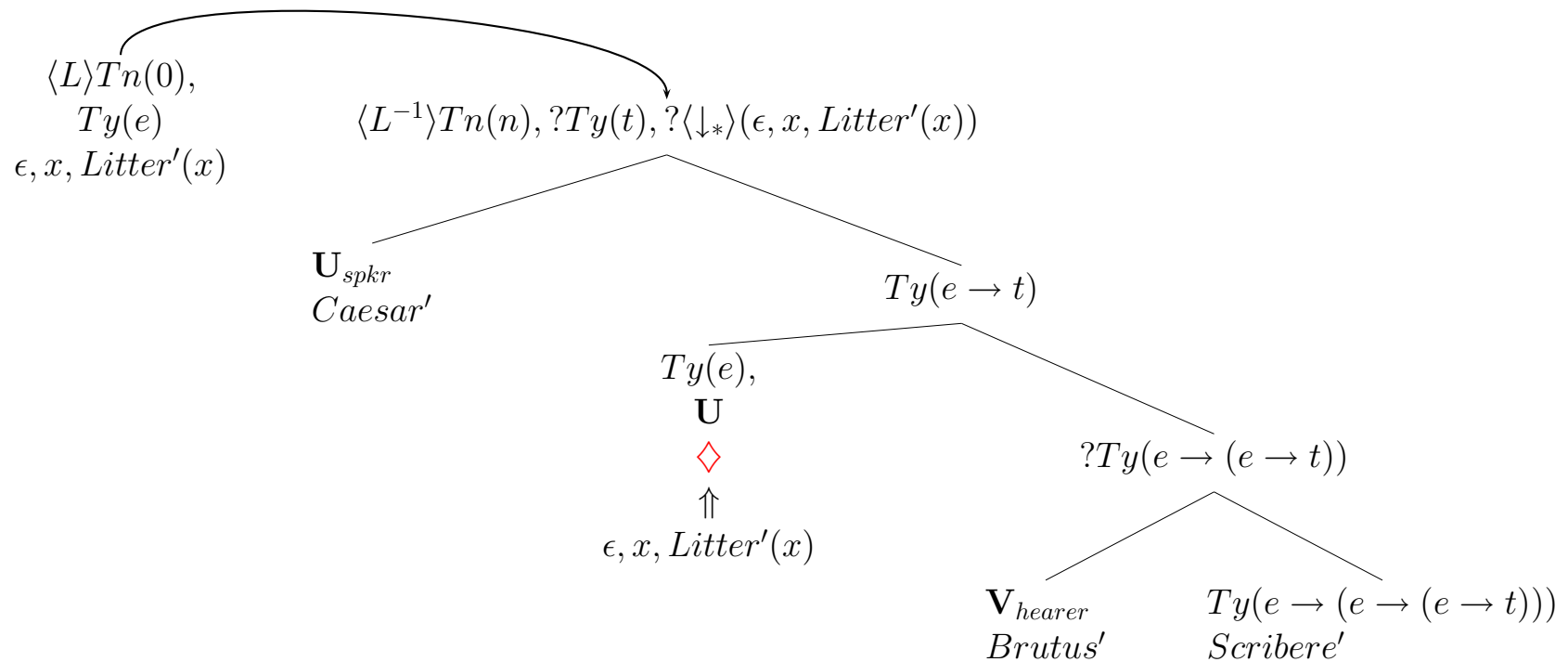
Preserving restriction on one unfixed node of a type at a time



## Building a LINK relation from the root

### Hanging Topic Left Dislocation

(10) *haec ad te scripsi verbosius*  
 these things to you write<sub>1.sg</sub> with some verbosity

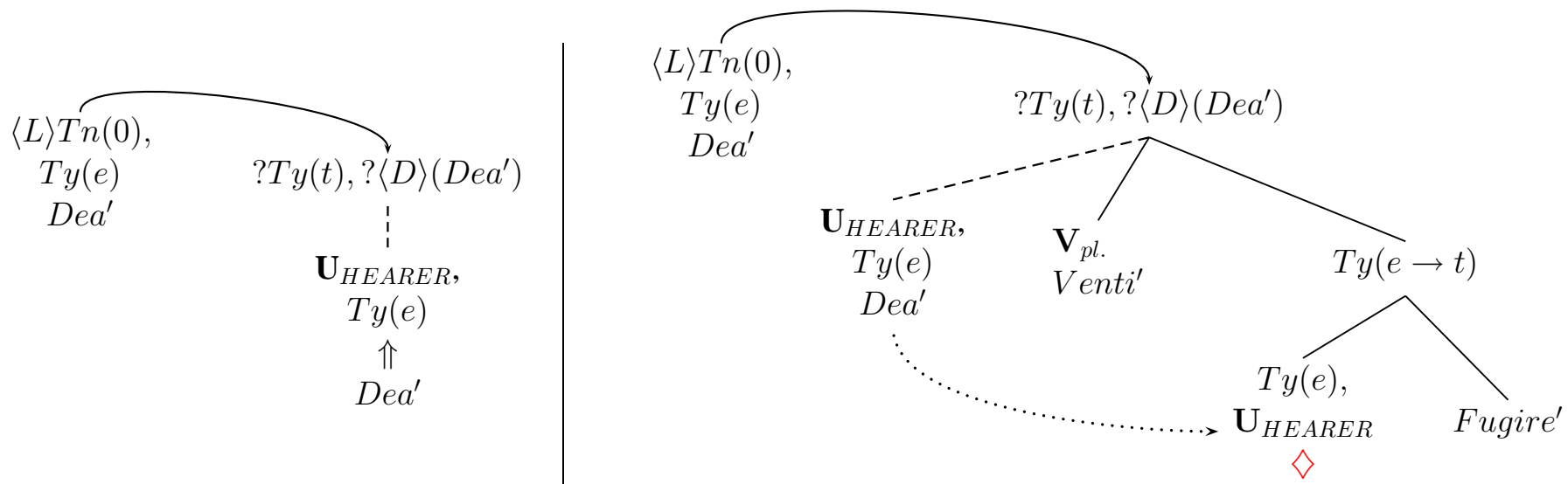


The main structure requires a COPY of formula from the first tree.

## Building a LINK relation from the root

Non-initial use of LINK

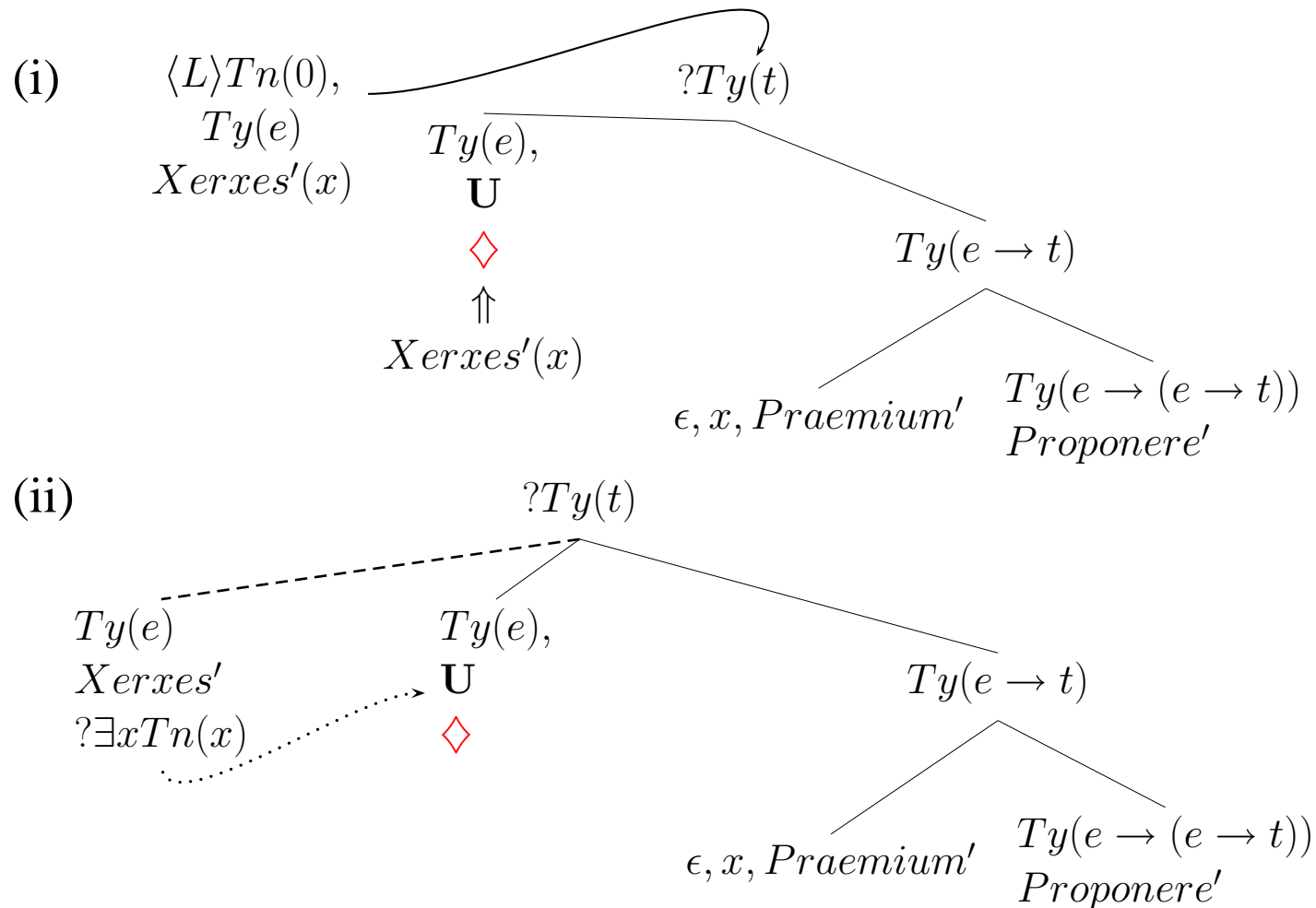
(11) *te* *Dea* *te* *fugiunt*  
 you<sub>DAT</sub> Goddess<sub>VOC</sub> you<sub>DAT</sub> flee<sub>3.plural</sub>



Building an unfixed node, and then a LINK transition

# Parsing alternatives

*Xerxes praemium proposuit*  
 Xerxes a reward offered



## Incremental processing and word-order choice

Challenge of incremental word search - full lexicon search is expensive

Context used to bypass lexical search mechanisms

**Anaphora and Context Search:** anaphoric expressions are placed to *minimise* search space for both speaker and hearer to utilise what is already there in the context - prior to the introduction of new material.

- Context search is minimised by placing words that need to be interpreted relative to context at an early stage in constructing a newly identified emergent propositional structure.
- This process is driven by relevance-theoretic/economy considerations – minimising context is a default.

Hence, tendency for *given-new* ordering

(12) *Plecaremus nos ad Montem Dei. Mons ipse unus esse videtur...*

We turned towards the Mountain of God. That mountain seemed to be one....  
[ *Peregrinatio Aegeriae*, 4C AD. ]

and early placement of anaphors

## Systemisation of word-order choice in incremental generation

**Wackernagel 2nd position effects:** minimising production costs:

Context-identification of ALL pronouns has to be minimised – smallest context search is achieved by early placement in a string determining where a new emergent propositional structure has been identified.

- Left-peripheral strong pronouns decorate linked structure/unfixed node - potentially independently identifying an emergent propositional structure

(13)

A *Tibi ego dem?*  
 you<sub>DAT</sub> I<sub>NOM</sub> give<sub>1.sg.prs.sbj</sub>  
 Should I give it to you?

B *Mihi hercle vero.*  
 me<sub>DAT</sub> by Hercules truly  
 Yes, to me, by god!

- Other pronouns occur as soon as *something* else determines an emergent propositional edge:

**negation, subordinator, focussed/WH expression, relative-pro, verb**

## Routinisation and Diachronic Change

**Routinisation effects:** shared terms and action-sequences are lexically stored as a unit for re-use in dialogue, as a further economy measure (Garrod & Doherty 1994 how speakers store conversational routines)

So grammar development in adults as well as children involves calcification of frequent pragmatic choices made between variants.

Such routinisation drives syntactic change: Latin to Medieval Spanish

- Pragmatic choices become calcified through routinisation
- Strong and weak forms of pronoun increasingly diverge  
result: distinct lexical encoding of previous pragmatic choices
- So far seen Given-new ordering choices lexically stored as individual TRIGGER+actions for clitic production and construal.
- Drive for processing economy also affects update actions:
- Action building node for clitic to decorate/fix (reflex of scrambling) becomes part of lexicalised action-sequence for pronoun form:  
UNFIXED or FIXED NODE or NODE CLUSTER or LINKED TREE.

## Routinised pairings of clitic plus sequence of actions

Earlier free word order effects make available several strategies:

(i) “Build and fix node immediately” - (constructive case):

(14) *Yo Martin Perez la escribí*  
I Martin Perez it<sub>FEM.sg</sub> wrote

(ii) “Build an unfixed node and leave” - (no update by case)

(15) *Quien te hizo rey?*  
who you made.3sg king

(16) ... *quien te algo prometiere* ..  
.. who you something would-promise ..

(iii) “Build two argument nodes together” - (building clitics as cluster)

(17) *A mi padre se la dieron*  
to my father CL CL gave<sub>3pl</sub> ‘My father, they gave it to him’

(iv) “Build linked structure” - (1 clitic as linked node, 1 as (un)fixed)

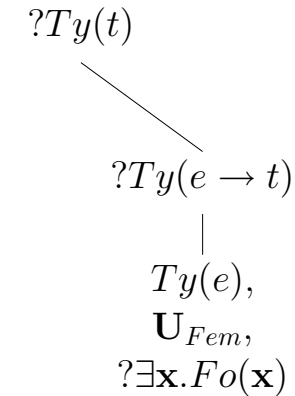
(18) *Et los dioses me quisieron mal e me lo quieren*  
And the gods CL want<sub>3pl,past</sub> harm and CL CL want<sub>3pl,pres</sub>

## Routinisation and Diachronic Change: an overview

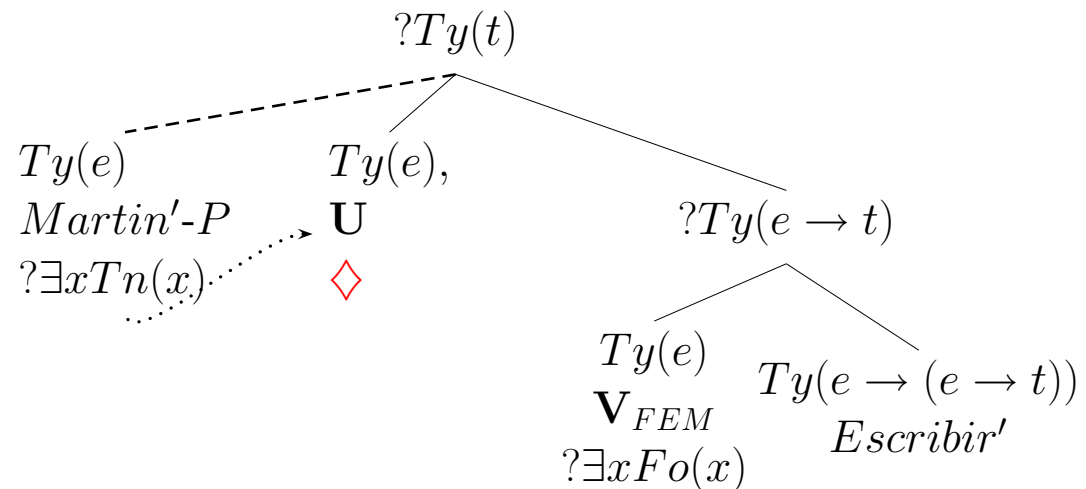
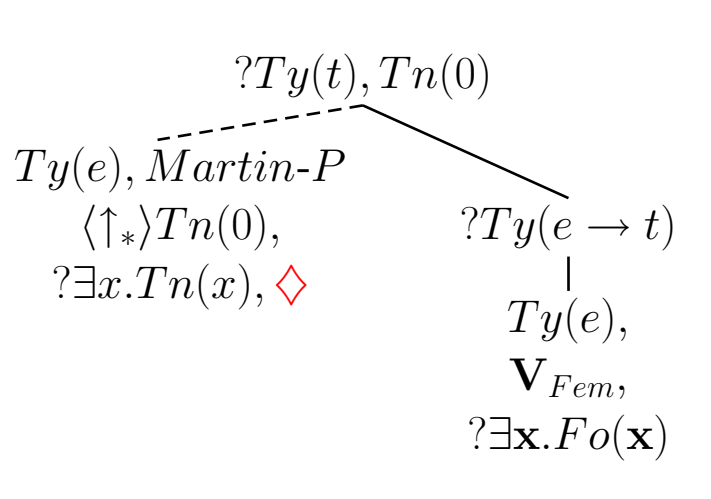
- Change of trigger for projecting actions of (clitic) pronoun to reflect early placement
- Change of actions of (clitic) pronouns as individual, syncretic and clustered forms select amongst the range of strategies associated with earlier local constituent-order variation:
  - Fixed node: Local\*Adjunction plus update:e.g. *la, lo* (French *le*)
  - Locally unfixed node, i.e. unspecified argument role (syncretism) (DO or IO interpretation) - direct reflex of Local\*Adjunction: e.g. *me, te, le* [Castilian Spanish]:
  - Locally unfixed node, case as output-filter, (no syncretism) eg Greek 1.ps.clitics: *me*<sub>ACC</sub>, *mu*<sub>GEN/DAT</sub>
  - Pair of argument nodes built on unfixed node: e.g. *me lo*  
with semantic idiosyncrasy: e.g. *se los*  
with phonological idiosyncrasy: e.g. *glielo* (Italian)  
with order variation: e.g. *le lui* (French)

# Object clitic specification

*la* IF  $?Ty(t)$   
 THEN IF .... “proclisis triggers”  
 THEN make( $\langle \downarrow_1 \rangle$ ); go( $\langle \downarrow_1 \rangle$ );  
 put( $?Ty(e \rightarrow t)$ )  
 make( $\langle \downarrow_0 \rangle$ ); go( $\langle \downarrow_0 \rangle$ );  
 put( $Ty(e), \mathbf{U}_{FEM}, ?\exists \mathbf{x}.Fo(\mathbf{x})$ )  
 gofirst( $?Ty(t)$ )  
 ELSE .... “enclisis actions”  
 ELSE Abort

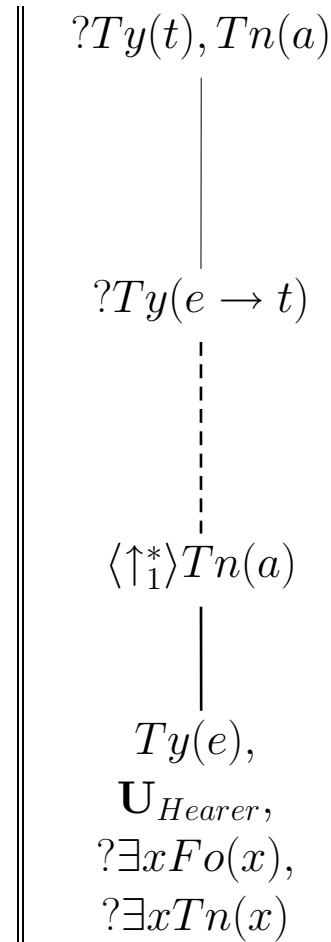


(19) *Yo Martin Perez la escribí.* ‘I Martin Perez wrote it’



## Dative clitic specification

<i>te</i>	<pre> IF      ?Ty(t), Tn(a) THEN IF  "...triggers for proclisis"         THEN make(↓<sub>1</sub>); go(↓<sub>1</sub>)            put(?Ty(e → t))            make(↓<sub>*<sup>1</sup>); go(↓<sub>*<sup>1</sup>)            put(⟨↑<sub>1</sub><sup>*</sup>⟩Tn(a));            make(↓<sub>0</sub>); go(↓<sub>0</sub>)            put(Ty(e),               Fo(U<sub>Hearer</sub>),               ?∃xFo(x), )               ?∃xTn(x)            gofirst(?Ty(t))         ELSE "...enclisis actions" ELSE Abort         </sub></sub></pre>
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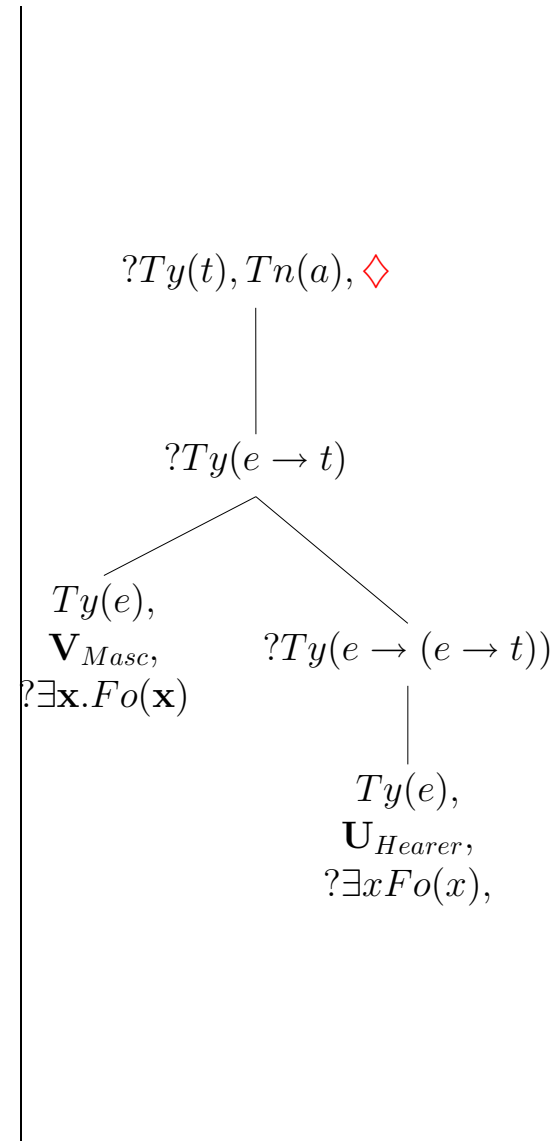


# Lexical Compound Specifications

*telo* (20)

```

IF      ?Ty(t)
THEN IF .... “proclisis triggers”
      THEN make(↓1); go(↓1)
           put(?Ty(e → t))
           make(↓1); go(↓1)
           put(?Ty(e → (e → t)))
           make(↓0); go(↓0)
           put(Ty(e),
              Fo(UHearer),
              ?∃x Fo(x))
           go(↑0↑1);
           make(⟨↓0⟩); go(⟨↓0⟩)
           put(Ty(e),
              Fo(VMale),
              ?∃x Fo(x))
           go(↑0↑1)
      ELSE “...enclisis actions”
ELSE Abort
    
```



## Bonus: Explaining Morphological Gaps as Tree-Growth Constraint

- No co-occurrence of *me* and *te* forms  
syncretism effect (one form, more than one construal)
  - The solution: Both clitics decorate a locally unfixed node.  
Their non-co-occurrence is due to the restriction of  
no more than one unfixed node at a time - tree-growth restriction
- The “Person Case Constraint”  
1st/2nd pers as IO plus 3rd person DO is grammatical  
1st/2nd pers as DO plus 3rd person IO is ungrammatical
  - The solution: first and second person clitics decorate  
a locally unfixed node, and so does a dative.  
Their non-co-occurrence is due to the restriction of no more than  
one unfixed node at a time
  - Explanation available even for non-syncretic cases as long as case spec-  
ification analysed as output filter:  
(Greek *me*, *mu* )
- The restriction is structural, entirely general.

## The Problem of Spanish: Lack of PCC

Co-occurrence of 1st and 2nd person clitics

(21)

*rogando a dios te me guarde muchos años y te me deje uer*  
 asking to God you me keep many years and you me let see  
 ‘asking God to keep you for me many years and let me see you’ (18c)

(22) *Los maitines inaugurales te me devolvieron*  
 the matins inaugural you me returned

‘The inaugural matins returned you to me.’ (20c)

(23) *muerta yaces señera ado te me han leuado*  
 dead lie alone where you me have taken

”Dead you lie alone there where they have taken you” (14c)

Blurring of ethical dative and IO dative (Latin, Med.Sp. ....)

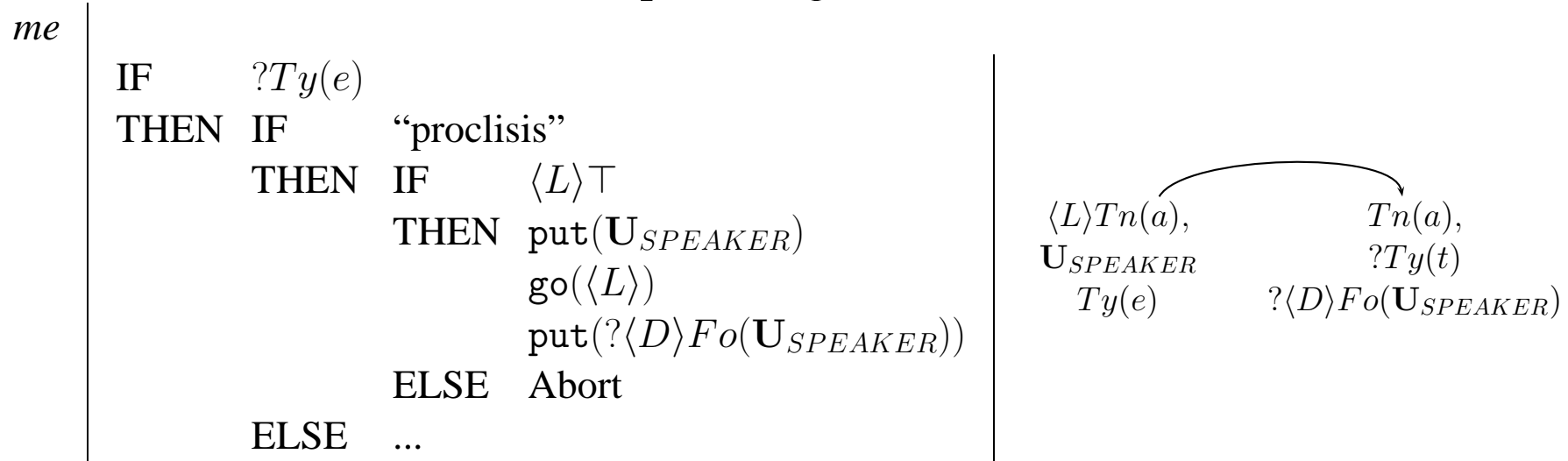
(24) *Quid tibi Celsius agit?*  
 How to you Celsius does?

How is Celsius, from your perspective?

LINK transition can be constructed from ?Ty(t) node, hence as a possible strategy for any occurrence of *me/te* (in either order) preceding the verb.

## The counter-examples explained as emergent homonymy

- Routinisations of distinct construals may lead to bifurcation of content
- Spanish, like Latin, has homonymous DATIVE, with LINK transition from ?Ty(t) node in addition to inducing unfixed node. The LINK strategy not in conflict with other unfixed node. Hence *me/te* (in either order) preceding the verb.



Routinisation/bifurcation into discrete encodings is item-by-item.

- Greek never established a distinct ethical Dative “form” of the clitic. Hence co-occurrence constraint on Greek *1st/2nd* pairings persists despite ethical dative construals paralleling Spanish.

## Other Ways of side-stepping PCC

- Alternative strategy of clustering on first unfixed node:

(25) *Qui'd nos dio pro alcalde?*  
 Who<sub>2sgCL</sub> 1plCL gave as major?  
 Who gave you to us as mayor?

The first of the pair of clitic nodes is built on the initial unfixed node, so second pronoun can decorate an independently constructed locally unfixed node.

- Reflexives in any case distinct as they involve binding pairs of argument nodes.
- Consequently three strategies for expecting apparent PCC violations
- Expectation that either clitic can co-occur with second pronoun in strong form

## Person Case Constraint Explained

- Individual clitic actions lexically defined, allowing idiosyncrasy
- Set of types of action the range of scrambling actions
- PCC a consequence of tree logic  
hence apparent clitic anomalies explained as hard syntactic constraint
- Space for exceptions, given parsing perspective  
with syntax as providing range of tree-growth strategies
- Clitic distribution explained synchronically as lexical specifications,  
but grounded in dynamics of tree growth following parse dynamics
- No recourse to separate morphology-internal principles
- Syntactic change a consequence of routinisation of pragmatic choices,  
driven by economy pressures on speakers
- Syntactic change can take place via routinisation to lexical encoding, in principle allowing continuous change
- The basis for explanation turns on tight coordination between speaker and hearer, not available in other frameworks

## Combining Shifting status of triggers and actions

- Latin strong/weak pronouns: former characteristically at initial position, latter at second position, a disjunction of:  
complementiser, negation, relative pronoun, left-initial (NP), (conjunction)
- Apparent increase in system complexity in Medieval Spanish:  
some obligatory pro-clitic triggers for preverbal placement, some obligatory postverbal placement, some variation (eg subject NPs, coordination, clausal adverbials), with verb following but some interpolation
- Continuing routinisation of preverbal triggering with subsequent system simplification:  
Modern Spanish system as simplification  
(clitic position determined by verbal form)
- Modern variation in syncretis effects – variant routinisations continue  
(leista, laista, loista)
- Co-occurring increase of system complexity by homonymy encoding  
always available
- Invariant progressive cost-minimisation for speakers despite  
no apparent uni-directional shift towards system simplification

## Coming together of Language as Procedures view

- Grammar as a set of procedures implemented by both speaker and hearer. Hence tight coordination between speaker and hearer
- Semantic change: lexical content always polysemous, with cluster of putative context-dependent interpretations, hence systemically flexible word meaning (Larsson 2008, Cooper and Ranta 2008: language as a set of tools for constructing formal languages)
- New puzzles: why is it only syntactic clusterings that tend to simplify, while semantic clustering is stable in the sense of preserving a cluster-property?  
Routinisations of distinct structural alternatives driven ONLY by need to minimise processing costs: leading first to discrete itemisations, then to progressive simplification  
Semantic clustering reflects potential for divergent inferential effect
- Language as a shifting vehicle for building up representations of content

Language is a specialised signal-processing mechanism designed for tightly coordinated use

Language as a tool for communication/dialogue/coordination?

Comments - points to challenge?? – PLEASE

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