On the non-isomorphism of chain links

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There are two ways in which a set of constituents can be identified as copies: (i) either they are marked as non-distinct with an index or (ii) they are identified as non-distinct by some inspection of their properties (i.e., features). I argue that the later option allows for a simpler and more elegant explanation of Anti-Reconstruction. Also, a little introduction to the topic is offered.

1. Explaining the displacement property of human language

A striking property of human language is the possibility of interpreting an element as if it were in a different position in the sentence.

(1) a. Mary kissed [THEME John].
     b. [THEME John] was kissed (by Mary).
     c. [THEME John], Mary kissed.

However, other interpretative properties are affected if a constituent occupies a different position.

(2) a. John seems to a teacher to be likely to solve every one of these problems.
         ($\exists > \forall$; *$\forall > \exists$)
     b. Every one of these problems seems to a teacher to be likely to be solved by John.
         ($\exists > \forall$; $\forall > \exists$)

These facts were classically explained by assuming movement operations. When constituent moves, it leaves behind a coindexed trace (cf. Chomsky 1973).

(3) John$_i$ was kissed t_i.

Chomsky (1993): there are no movement operations; the displacement property follows from the phonological realization of *chains*.

(4) *Chain*
     A set of non-distinct constituents in the syntactic representation.

There is a Copy operation creating non-distinct occurrences of some syntactic objects:

(5) a. K = ___ was kissed John
     b. K = ___ was kissed John
         L = John
     c. John was kissed John

Both occurrences of *John* form a chain CH = (John, John). Only one of the copies in the chain is pronounced. According to Chomsky, it is a deletion process related to ellipsis (see also Donati 2003, Saab 2008, among others).

(5) John was kissed ~~John~~

Evidence for Copy Theory: there are languages in which some copies can be pronounced.

(6) *Romani*
Kas	misline	kas	o Demiri	dikhlâ?
Who	think	who	Demir	saw
     '*Who do you think Demir saw?*'

(7) *German*
Wen	glaubt	Hans	wen	Jakob	gesehen	hat?
Who	thinks	Hans	who	Jakob	seen	has
     '*Who does Hans think Jakob saw?*'

(8) *Porteño Spanish*
Ganamos	el partido,	ganamos.
Win.1pl	the match	win.1pl
     '*We WON the game*'.

2. Reconstruction and copies

Consider (9): a pronoun can be bound by a quantifier only if there is a c-command relation[1].

(9) a. Which student of his$_i$ did [no professor]$_i$ talk to?
     b. *Which student of his$_i$ talked to [no professor]$_i$?

This pattern is explained by the theory of movement.

(10) a. [Which student of his$_i$]$_j$ [did [no professor]$_i$ talk to t_j]?
      b. *[Which student of his$_i$]$_j$ [t_j talked to [no professor]$_i$]?

Under *Trace Theory* you need to "reconstruct" the representation before the movement.

(11) a. ____ [did [no professor]$_i$ talk to which student of his$_i$]?
      b. ____ [which student of his$_i$ talked to [no professor]$_i$]?

Under Copy Theory, the explanation follows straightforwardly.

(12) a. [Which student of his$_i$] [did [no professor]$_i$ talk to [which student of his$_i$]]?
      b. *[Which student of his$_i$] [[which student of his$_i$] talked to [no professor]$_i$]?

Consider sentence (13): it involves a violation of Condition C (i.e., a R-expression must not bound).

(13) *He$_i$ believed an argument that John$_i$ is a genius.

Now, compare it with (14).

(14) *[Which argument that John$_i$ is a genius] did he$_i$ believe?

Now, tell me: which analysis allows explaining (15) straightforwardly?

(15) a. [Which argument that John$_i$ is a genius]$_j$ did he$_i$ believe t_j?
      b. [Which argument that John$_i$ is a genius] did he$_i$ believe [which argument that John$_i$ is a genius]?

Why would you "reconstruct" something that leads to an unacceptable result? Copy Theory seems to explain better this kind of unacceptability.

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[1] C-command is a relation that very often correlates with word order in languages like English or Spanish. For our purposes, we can simple assume that the quantifier requires preceding the pronoun.

There are, however, some problematic cases for a "bare" explanation of Reconstruction based on Copy Theory. A sentence like (16) becomes acceptable if the conflicting R-expression is inside an adjunct.

(16) [Which argument [ADJ that John$_i$ made]] did he$_i$ believe __?

According to Lebeaux (1988), these cases of anti-reconstruction do not involve a real violation of Condition C. I will refer to his approach as the *Lebeauxian Approach to Anti-Reconstruction.*

(17) *Lebeauxian Approach to Anti-Reconstruction (LATAR)*
    Apparent violations of Condition C follow from the absence of the constituent containing the relevant R-expression in some links of the movement chain.

(18)
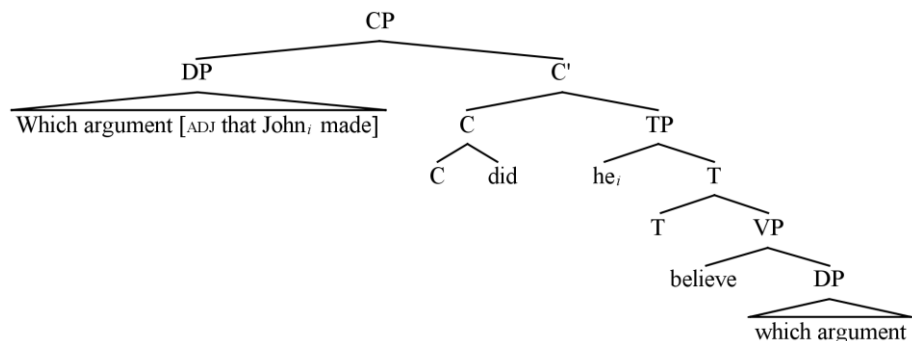
Recently, LATAR has been extended to capture phenomena involving A-movement (cf. Takahashi & Hulsey 2009). As Chomsky (1995) observes, A-movement can bleed Condition C.

(19) [The claim that John$_i$ was asleep] seems to him$_i$ to be correct __.

Adapting Lebeaux's proposal, Takahashi & Hulsey (2009) propose that the complement NP of the determiner *the* (i.e., the constituent containing the R-expression *John*) is only present in the head of the chain.

(20)
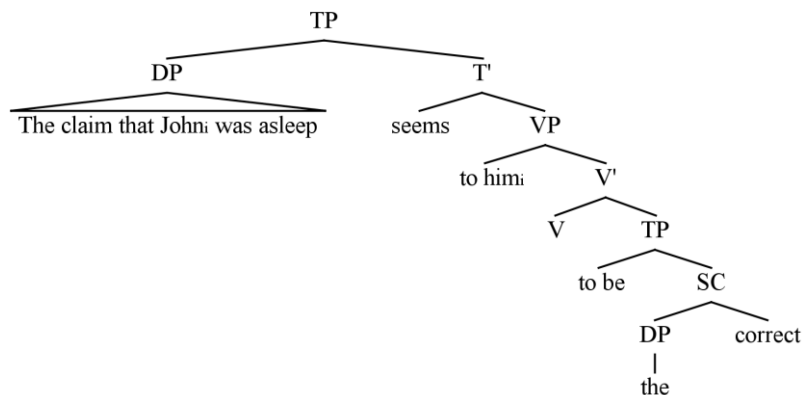
Convergent evidence to assume the presence of bare determiners in low links of movement chains is provided by Stanton (2014). Consider the following: temporal *in* is a pronoun-rejecting preposition that only allows for some types of A'-extraction.

(21) *I went swimming in December, and John went swimming in it, too.

(22) a. Which month did John go swimming in?   WH-MOVEMENT
      b. The month that John went swimming in was very cold.   RESTRICTIVE RELATIVE
      c. *December, John went swimming in.   TOPICALIZATION
      d. *December is tough to swim in.   TOUGH-MOVEMENT

However, pronoun-accepting locative *in* allows for all types of A'-extraction.

(23) Michelle's cat hid in the cardboard box, and my cat hid in it too.

(24) a. Which box did Michelle's cat hide in?   WH-MOVEMENT
      b. The box that Michelle's cat hid in was made of cardboard.   RESTRICTIVE RELATIVE
      c. That cardboard box, Michelle's cat hid in.   TOPICALIZATION
      d. Cardboard boxes are easy for cats to hide in.   TOUGH-MOVEMENT

According to Stanton, Wh-movement and restrictive relative movement are part of the same natural class, A-Extractions, while Topicalization and Though-movement are considered B-Extractions. A-Extractions always leave behind a full copy of the constituent; B-Extractions leave behind a bare D (see Stanton 2014 for a full battery of tests). Since bareI-Samenessare "pronoun-like", it is predicted that B-Extractions cannot take place with pronoun-rejecting prepositions.

Stanton offers compelling evidence for this analysis. For example, she observes that A-Extractions are also forbidden when the extracted element is a pronoun.

(25) a. My family eats dinner on the green table. John's family eats dinner on it too.
      b. What table does your family eat dinner on?
      c. What does your family eat dinner on?

(26) a. *My family eats turkey on Thanksgiving. John's family eats turkey on it too.
      b. What holiday does your family eat turkey on?
      c. * What does your family eat turkey on?

Notice that the analyses presents so far assume chains as the following:

(27) a. CH = (which argument that John made, which argument)   CF. (16)
      b. CH = (the claim that John was asleep, the)   CF. (19)

THE PROBLEM:
- LATAR requires assuming that *non-identical constituents* can form chains.

                                But…

- Under Copy Theory, elements in chains are supposed to be non-distinct.

                                So…

    What is the definition of *Sameness/Non-Distinctiveness* we need to account for these patterns?

In what follows I will discuss two different conceptions of Sameness and the way they deal with LATAR.

3. I-Sameness

The "standard" approach assumes that two elements are recognized as "the same" if they share the same index (cf. Chomsky 1995, Nunes 1995, 2004).

(28) a. *Derivational step α*
   $K = [_{TP}$ was $[_{VP}$ kissed John$_1]]$
   b. *Copy*
   $K = [_{TP}$ was $[_{VP}$ kissed John$_1]]$
   $L = $ John$_1$
   c. *Derivational step α+1*
 $[_{TP}$ John$_1$ $[_{T'}$ was $[_{VP}$ kissed John$_1]]]$

Let's call this type of sameness relation *Indexical Sameness,* or *I-Sameness* for short.

(29) *I-Sameness*
   Two constituents α and β are "the same" if the Copy operation (or any other derivational mechanism) assigned them the same index.

Under this definition of Sameness, deriving chain formation with non-identical links requires:

(30) a. Generating two (or more) strictly identical copies, with the same index.
   b. Applying an additional operation on the higher copy to introduce the constituent with the relevant R-expression.

(30') a. b.
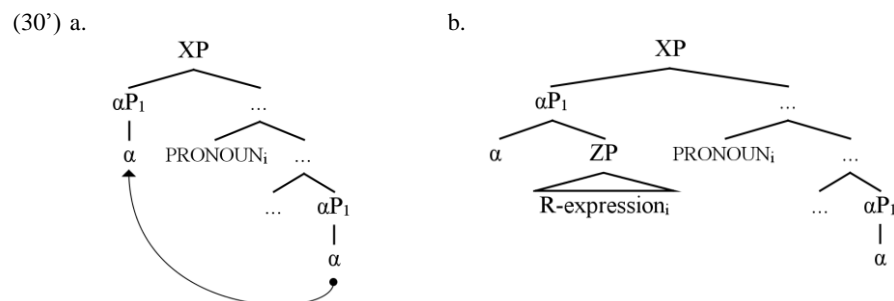
Late Merger (Lebeaux 1988) and *Wholesale Late Merger* (Takahashi & Hulsey 2009) are two versions of this type of operation. In a nutshell, they involve merging a constituent *countercyclically* inside a derived specifier.

(31) *Extension Condition (Chomsky 1993)*
   Syntactic operations must extend the tree at the root.

We want our syntactic operations obeying cyclicity because it has become an explanatory notion in modern theoretical linguistics. For example, subject-object asymmetries follow basically from a different timing of combination.

(32) a. $[_v$ V DP$]$ OBJECT
   b. $[_v$ DP $[_v$ …$]]$ SUBJECT

THREE PROBLEMS WITH I-SAMENESS:
- It violates the *Inclusiveness Condition* (Nunes 1995, 2004, Leung 2007, Neeleman & van de Koot 2010)[2].
- Deus ex machina: it is not a true theory of Copy Sameness; it is just a marking mechanism. There are no independent principles or conditions deriving Sameness.
- It requires abandoning strict cyclicity to capture anti-reconstruction effects under LATAR.

4. R-Sameness

Sameness can also be defined through evaluation and comparison of the properties of syntactic constituents.

(33) *Assumption A*
   Syntactic terminals are taken to be sets of features (i.e., *Late Insertion*).

A syntactic feature is a pair *attribute-value* <Att, VAL>, where the attribute denotes a *feature-class* and the value denotes a member of such a class (cf. Gazdar et al. 1985, Adger & Svenonius 2011).

(34) a. <Category, V>
   b. <Gender, FEMININE>
   c. <Number, PLURAL>
   d. …

(35) *Assumption B*
   Features at the interfaces are interpreted as privative values.

In other words, LF and PF can only see the value of a feature, not its attribute.

(36) a. {<Cat, D>. <Gen, FEM>, <Num, PL>, <Per, 3>, <κ, NOM>}   SYNTAX
   b. {D, FEM, PL, 3, NOM}   INTERFACES

Unvalued features are *uninterpretable* (i.e., inaccessible or invisible for the interfaces).

(37) a. {<Cat, D>. <Gen, FEM>, <Num, PL>, <Per, 3>, <κ, __>}   SYNTAX
   b. {D, FEM, PL, 3}   INTERFACES

(38) *Assumption C*
   The Activity Condition[3] applies both for A and A'-dependencies.

Therefore, some DPs should carry unvalued features for both Case $κ$ and left-peripheral features $ω$.
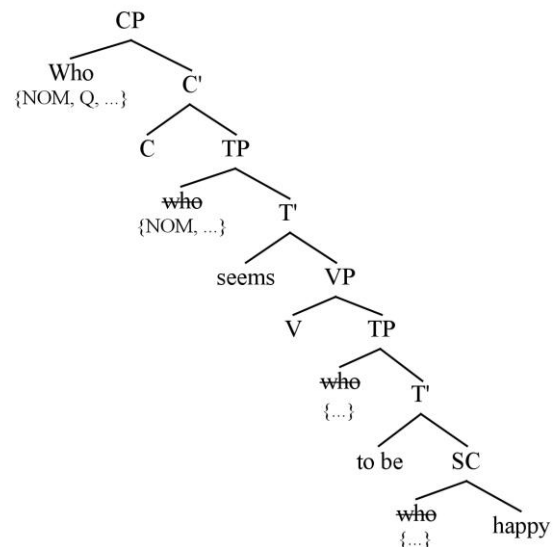
(39) a. $[_{CP}$ Who $[_{TP}$ ~~who~~ seems $[_{TP}$ ~~who~~ to be $[$~~who~~ happy$]]]]$?
   b. Who$_{\{<κ,NOM>,<ω,Q>, …\}}$ … who$_{\{<κ,NOM>,<ω,\_>, …\}}$ … who$_{\{<κ,\_>,<ω,\_>, …\}}$ … who$_{\{<κ,\_>,<ω,\_>, …\}}$

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[3] The Activity Condition states a requirement for a constituent to enter in Agree relations:

   (i)   *Activity Condition (Chomsky 2001)*
   A goal G is accessible for Agree iff G has at least one uninterpretable feature.

(40) *Representation at the interfaces*

CP
- Who {NOM, Q, ...}
- C'
  - C
  - TP
    - ~~who~~ {NOM, ...}
    - T'
      - seems
      - VP
        - V
        - TP
          - ~~who~~ {...}
          - T'
            - to be
            - SC
              - ~~who~~ {...}
              - happy

There is an *inclusion* relation between the (features of the) occurrences of *who*. Such a relation will arise systematically for every new copy of α, so it may be capitalized to define Sameness:
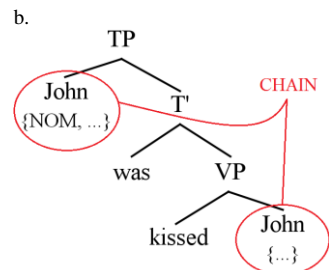
(41) *Representational Sameness (R-Sameness)*[4]
Two constituents α and β are "the same" if:
a. α c-commands β,
b. the features of β are a subset of the features of α,
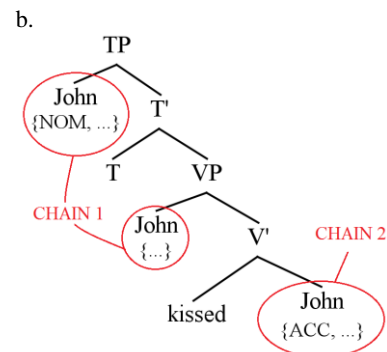c. there is no δ between α and β being a proper subset of α or a proper superset of β.

This relation is *transitive* (as any other identity-type relation): if A = B and B = C, then A = C.

(42) a. John was kissed ~~John~~.
b.

TP
- John {NOM, ...}
- T'
  - was
  - VP
    - kissed
    - John {...}

CHAIN

(43) a. John ~~John~~ kissed John.
b.

TP
- John {NOM, ...}
- T'
  - T
  - VP
    - John {...} — CHAIN 1
    - V'
      - kissed
      - John {ACC, ...} — CHAIN 2

(44) a. John ~~John~~ said that John was kissed ~~John~~.
b.

TP
- John {NOM, ...}
- T'
  - T
  - VP
    - John {...} — CHAIN 1
    - V'
      - said
      - CP
        - that
        - TP
          - John {NOM, ...}
          - T'
            - was
            - VP
              - kissed
              - John {...} — CHAIN 2

SOME PROPERTIES OF THIS SYSTEM:
- It generates "chains" based on the featural content of constituents; it does not say anything about the Copy operation (which I am not abandoning) or any marking mechanism.
- Since there are no "syntactic clues" on what elements may constitute a chain, the interfaces must scan *independently* the syntactic representation in search for non-distinct constituents.

Given that there is no direct connection between Copy operations, LF-chains and PF-chains, a set of scenarios with mismatches between these notions is predicted.
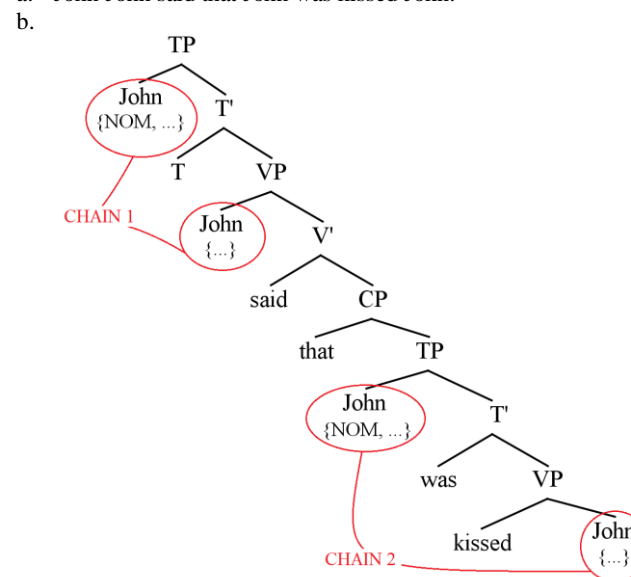
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[4] I call this *Representational Sameness* because it is based on the properties of elements in a syntactic representation. However, the representational nature of the definition may be translated into derivational terms.

| COPY OPERATION	LF-CHAIN	PF-CHAIN	PHENOMENON
YES	YES	YES	Movement
YES	YES	NO	Multiple Copies
YES	NO	YES	Suggestions???
YES	NO	NO	What-Constructions (partial copying)
NO	YES	YES	Anti-reconstruction (LATAR)
NO	YES	NO	Resumption???
NO	NO	YES	Null-Subjects
NO	NO	NO	Trivial Chain (no movement)

DS and multidominance-based approaches only make the first and last predictions (i.e., the YES-YES-YES and the NO-NO-NO scenarios) and require assuming additional machinery in order to explain the remaining phenomena in the table.
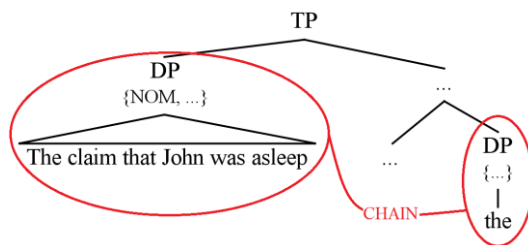
RELEVANT PREDICTION:
Under R-Sameness, two (or more) transformationally unrelated (i.e., base generated) DPs can form a chain as far as they comply with (41):

The definition of Sameness in (41) allows deriving the LATAR patterns in a pretty straightforward way.

(45)   Which argument that John made did he believe?   (CF. 18)
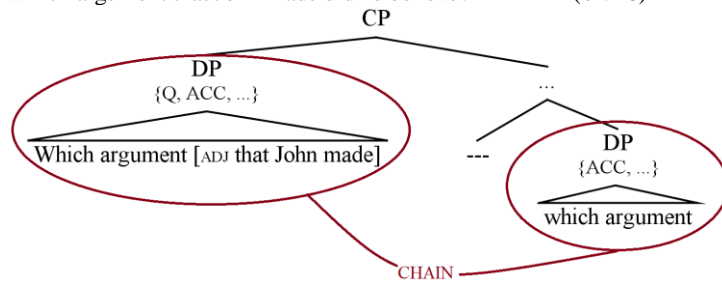
(46)   The claim that John was asleep seems to be correct.   (CF. 20)

THREE ADVANTAGES OF R-SAMENESS:
- It complies with the *Inclusiveness Condition*: no indexes, no marking mechanisms.
- Principled definition: it follows from some assumptions on the interpretation of features at the interfaces.
- It allows for a cyclic implementation of LATAR.

5. Conclusions
In this presentation:

- LATAR was introduced (and implicitly, I showed that it is, in a sense, independent of Late Merger)
- I have offered a principled definition of Sameness, a Gordian-Knot for Copy Theory.
- I have shown how R-Sameness may be used to account for Anti-reconstruction patterns under LATAR.

6. Appendix: constraining the system
In the version I just introduced, this system heavily overgenerates chains. Here, I sketch some additional restrictions to chain formation.

I am assuming two types of restrictions that were not mentioned in the main part of the presentation: (i) a more fine-grained theory of features, and (ii) interpretability conditions on the syntactic output. The former aims to constrain the chains formed by R-Sameness; the later restricts the representations that are acceptable under LATAR.

5.1. MORE ON FEATURES: SPECIFICATION AND DEACTIVATION
Consider the following sentence:

(48)   Juan,   dijo   Juan   que   vino.
        Juan   said   Juan   that   came
        'John, John said that he came'.

The sketchy system introduced in section 2 does not work for this kind of representation: (41) predicts the existence of only one chain.

(49)   a.   Juan, dijo Juan que ~~Juan~~ vino.
        b.   Juan$_{\{<\kappa,NOM>,<\omega,TOP>, ...\}}$ ... Juan$_{\{<\kappa,NOM>, ...\}}$ ... Juan$_{\{<\kappa,NOM>,<\omega, \_>\}}$
        c.   Juan$_{\{NOM, TOP, ...\}}$ ... Juan$_{\{NOM, ...\}}$ ... Juan$_{\{NOM, ...\}}$

(50)   CH = (Juan, ~~Juan~~, ~~Juan~~)

I think the main problem with the "sketchy" version of the system is the poor typology of features it adopts. Particularly, assuming the existence of only one class of discourse-related features ω is too restrictive.

Rizzi (2004) offers a more detailed classification of syntactic features. According to him, there are four mayor classes of features.

(51)   *Typology of licensing features (Rizzi 2004: 243)*
        a.   Argumental: person, number, gender, case
        b.   Quantificational: Wh, Neg, measure, focus...
        c.   Modifier: evaluative, epistemic, Neg, frequentative, celerative, measure, manner, …
        d.   Topic

In principle, DPs can carry Argumental, Quantificational and Topic features, the last two being a more fine-grained restatement of what an ω-feature is. Let's assume that carrying the attributes for these features is an inherent property of (a class of) D heads.

(52)   D$_{\{<Quant,\_>,<Top,\_>,<\kappa,\_>,<\phi,\_>, ...\}}$

Obviously, not every DP requires checking a Topic-feature, for example. In these cases, a *Deactivation Value* will be assigned to the relevant attribute.

(53) a. <Top, __>   ACTIVE FEATURE
     b. <Top, CONT>   INACTIVE FEATURE
     c. <Top, ~TOP>   DEACTIVATED FEATURE

(53a) is a feature that can enter in an Agree relation. (53b) is a feature that already entered in an Agree relation; it triggers Defective Intervention effects. (53c) is a feature that is "off" for syntactic operations; it cannot intervene.

Deactivated Features are interpretable at the interfaces: they trigger "by default" interpretations.

Under these assumptions, it is possible analyzing the sentence in (48) as follows:

(54) a. Juan, dijo Juan que ~~Juan~~ vino.
     b. Juan$_{\{<\kappa,NOM>,<Top,ABOUT>,<Foc, ~FOC>, ...\}}$ Juan$_{\{<\kappa,NOM>,<Top,~TOP>,<Foc, INFORM>, ...\}}$ ...
        Juan$_{\{<\kappa,NOM>,<Top,__>,<Foc, ~FOC>, ...\}}$
     c. Juan$_{\{NOM, ABOUT, ~FOC, ...\}}$... Juan$_{\{NOM, ~TOP, INFORM, ...\}}$ ... Juan$_{\{NOM, ~FOC...\}}$

5.2. CONSTRAINTS ON LATAR

Slightly modifying ideas from Takahashi & Hulsey (2009) and Fox (1999), two notions constrain the predictions of LATAR: (i) Agreement/Case, and (ii) semantic interpretability.

Regarding Agreement/Case, it should be noticed that a bare D cannot valuate the φ-features on a non-defective Probe:

(55) [$_{TP}$ T$_{\{<Per,__>,<Gen,__>,<Num,__>\}}$ ... [$_{vP}$ V D$_{\{<Per, 3>,<\kappa,__>\}}$]]

Therefore, it is necessary introducing a full DP with a complete set of φ-features *in the checking domain of the relevant Probe P* (i.e., as late as Spec,P).

(56) [$_{TP}$ DP$_{\{<Per, 3>,<Gen, FEM>,<Num, PL>, <\kappa, NOM>\}}$ [$_{T'}$ T$_{\{<Per, 3>,<Gen, FEM>,<Num, PL>\}}$ ... [$_{XP}$ D$_{\{<Per, 3>,<\kappa,__>\}}$]]]

PREDICTION A
Unpronounced caseless links in non-trivial chains (i.e., "traces" of A-movement) may be D$^{min/max}$, and D$^{min/max}$ cannot trigger Condition C violations.

Adjuncts do not affect the featural content of the constituent they are introduced in, so basically their presence in an unpronounced link is only constrained by interpretative principles (e.g., Binding Theory). Therefore, negative data involving adjuncts violating Condition C cannot be generated.

PREDICTION B
Condition C cannot be violated by a R-expression inside an adjunct.

Regarding interpretability, Fox (1999) assumes that *Trace Conversion* is required to apply to the lowest link in a chain to obtain a valid operator-variable representation under Copy Theory:

(57) *Trace Conversion (Fox 2002: 67)*
     a. Variable Insertion: (Det) Pred→ (Det [Pred λy(y=x)]
     b. Determiner Replacement: (Det) [Pred λy(y=x)] → the [Pred λy(y=x)]

(58) Which boy Mary visited ~~which boy~~?
      Paraphrase: Which is the boy x, such that Mary visited the boy x?
      LF: [Which boy] λx. Mary visited the boy x

(59) a. Which woman did Mary meet ~~which girl~~?
      b. Which woman$_{\{<\kappa,ACC>,<\omega,Q>, ...\}}$ ... which girl$_{\{<\kappa,ACC>,<\omega, __>, ...\}}$
      c. Which woman$_{\{ACC, Q, ...\}}$...which girl$_{\{ACC, ...\}}$
      d. CH = ([$_{DP}$ which woman], [$_{DP}$ which girl])

This derivation would be blocked because the output of Trace Conversion would be uninterpretable.

(60) *[*Which woman] λx. Mary meet the girl x*

If elliptical sites and traces of wh-movement form a natural class (i.e., if they are variables), then we should expect that both of them are constrained by similar identity conditions. If some of these conditions are semantic, then we need to consider them as *complementary* to (41).

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