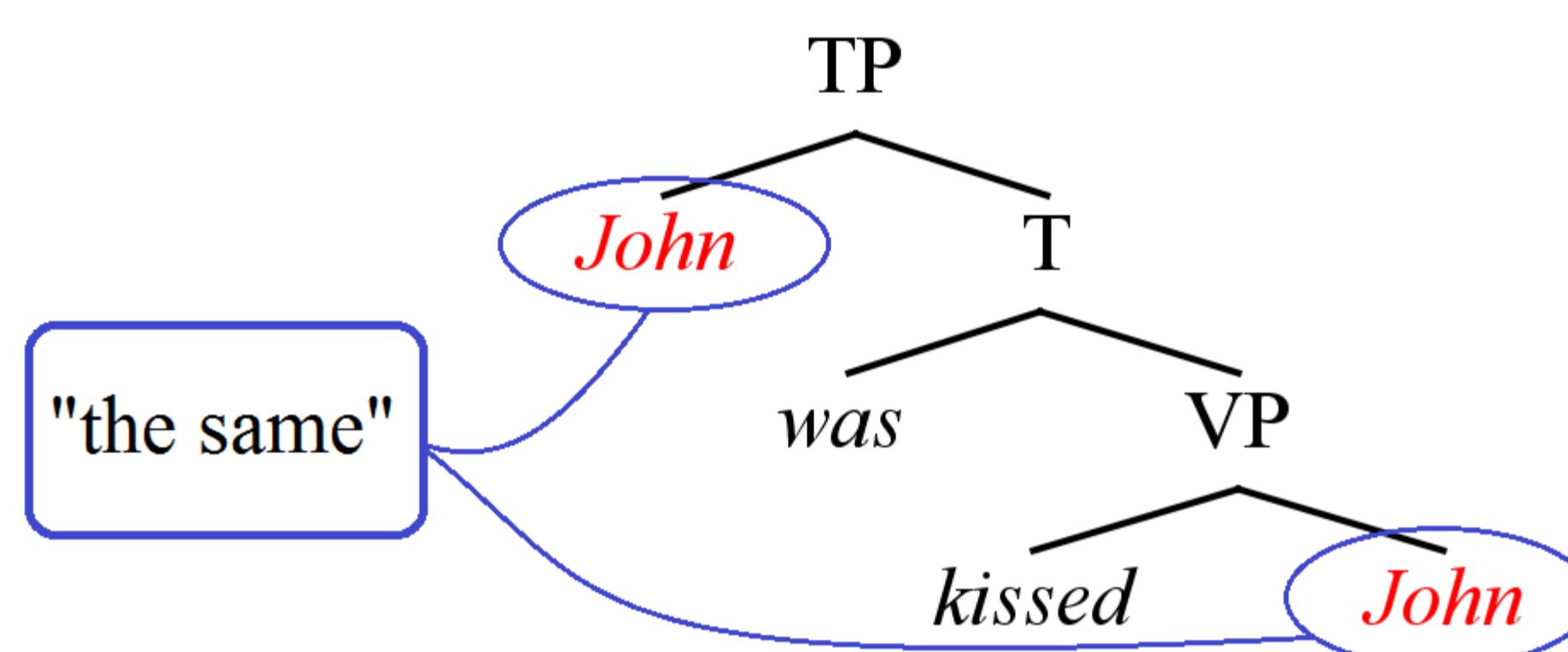


Chain formation as inclusion relations at the interfaces

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According to *Copy Theory* (Chomsky 1993) there are no real movement operations in language. The *displacement property* is explained in terms of how the interfaces interpret and manipulate collections of *non-distinct* constituents (i.e., *chains*).

Thus, *Non-Distinctiveness* (i.e., “*sameness*”) is one of the most fundamental properties of displacement dependencies under *Copy Theory*.



2. PROPOSAL

- Non-Distinctiveness of copies is based on a representational computation: it is evaluated post-syntactically at PF and LF.
- There is a common principle of chain formation for PF and LF that may be affected by interface-specific operations and constraints.
- Non-Distinctiveness is based on *inclusion* relations between the sets of features of syntactic objects.
- Some mismatches may arise between (i) narrow syntactic operations, (ii) PF-chains, and (iii) LF-chains.

2.1. THE SYSTEM

- *Late Insertion* (cf. Halle & Marantz 1993): syntactic terminals are sets of formal features without phonological information.
- A *syntactic feature* is a pair Attribute-Value, where the Attribute denotes a feature-class and the Value denotes a member of such a class: e.g., <Num,PL>.
- Such pairs are interpreted at the interfaces as instructions based on *privative* values. Thus, a syntactic terminal consisting on the features {<Att₁,α>,<Att₂,β>} will be interpreted at PF and LF simply as the set {α,β}.
- Therefore, an unvalued feature <Att,₁> will be *uninterpretable* (i.e., “invisible”) at the interfaces.
- *Agree* (Chomsky 2000, 2001) is assumed for both A and A'-dependencies: it relates a Probe carrying an unvalued feature <Att₁,₁> with an active Goal carrying a valued version of the same feature <Att₁,α>; the activity of the Goal is determined by an unvalued feature that will get satisfied after Agree.

Thus, each copy generated by an Agree-related requirement will check a feature (κ stands for Case, and ω stands for a left peripheral feature). The interfaces would “see” representations as (2c).

- (2) a. [CP Who [_{TP} who seems [_{TP} who to be ... who happy]]]]?
 b. Who{<_φ,3sg,<_κ,T>,<_ω,Q>} ... who{<_φ,3sg,<_κ,T>,<_ω,>} ... who{<_φ,3sg,<_κ,>,<_ω,>} ... who{<_φ,3sg,<_κ,>,<_ω,>} ...
 c. Who{3sg,T,Q} ... who{3sg,T} ... who{3sg} ... who{3sg} ...

Notice that there is an inclusion relation between the occurrences of *who*. Such a relation will arise systematically for every new copy of a constituent (even if $XP\{\dots\} = XP\{\dots\}$, the general case for cyclic movement), so it may be capitalized to define Non-Distinctiveness of copies.

(3) Non-Distinctiveness

Two constituents α and β are “the same” if: (i) α c-commands β , (ii) the features of β are a subset of the features of α , (iii) there is no δ between α and β being a proper subset of α or a proper superset of β .

3. MISMATCH BETWEEN PF AND LF-CHAINS

If chains are generated in parallel at both interfaces, scenarios where PF and LF-chains do not coincide are predicted. It will be advanced that this is the case for multiple copy phenomena:

- (4) *Wen* glaubt Hans *wen* Jakob gesehen hat? [German]
 Who thinks Hans who Jakob seen has
 ‘Who does Hans think Jakob saw?’

Nunes (2004) : a wh-pronoun is morphologically reanalyzed as part of a bigger word together with an embedded C through *Fusion* (Halle & Marantz 1993).

- (5) *Fusion* (Embick 2010: 78)
 $[_x \alpha] \cap [_y \beta] \rightarrow [_{x/y} \alpha, \beta]$, where α and β are features of X and Y.

When subordinate C and *wen* fuse, the result is a syntactic terminal containing the features of both elements:

- (6) [CP wen{Q,v,φ,...} [C C_{INT} ... [CP #C + wen#{C,v,φ,...} ... [VP V wen{v, φ,...}]]]]]

Since *Fusion applies on the PF side of the grammar only*, two PF-chains will be formed from (6).

- (7) CH₁ = (wen{Q,v,φ,...}); CH₂ = (#C + wen#{C,v,φ,...}, wen{v,φ,...})

However, a “normal” chain will be formed at LF, capturing the meaning of (4).

- (8) CH = (wen{Q,v,φ,...}, wen{v,φ,...}, wen{v,φ,...})

In a nutshell:

- According to (3), multiple copy phenomena imply multiple PF-chains.
- No extra assumptions are required for the analysis to work.

1. HOW IS “SAMENESS” IMPLEMENTED?

Chomsky (1995) proposed a marking mechanism. Nunes (1995, 2004) adopted the same kind of solution.

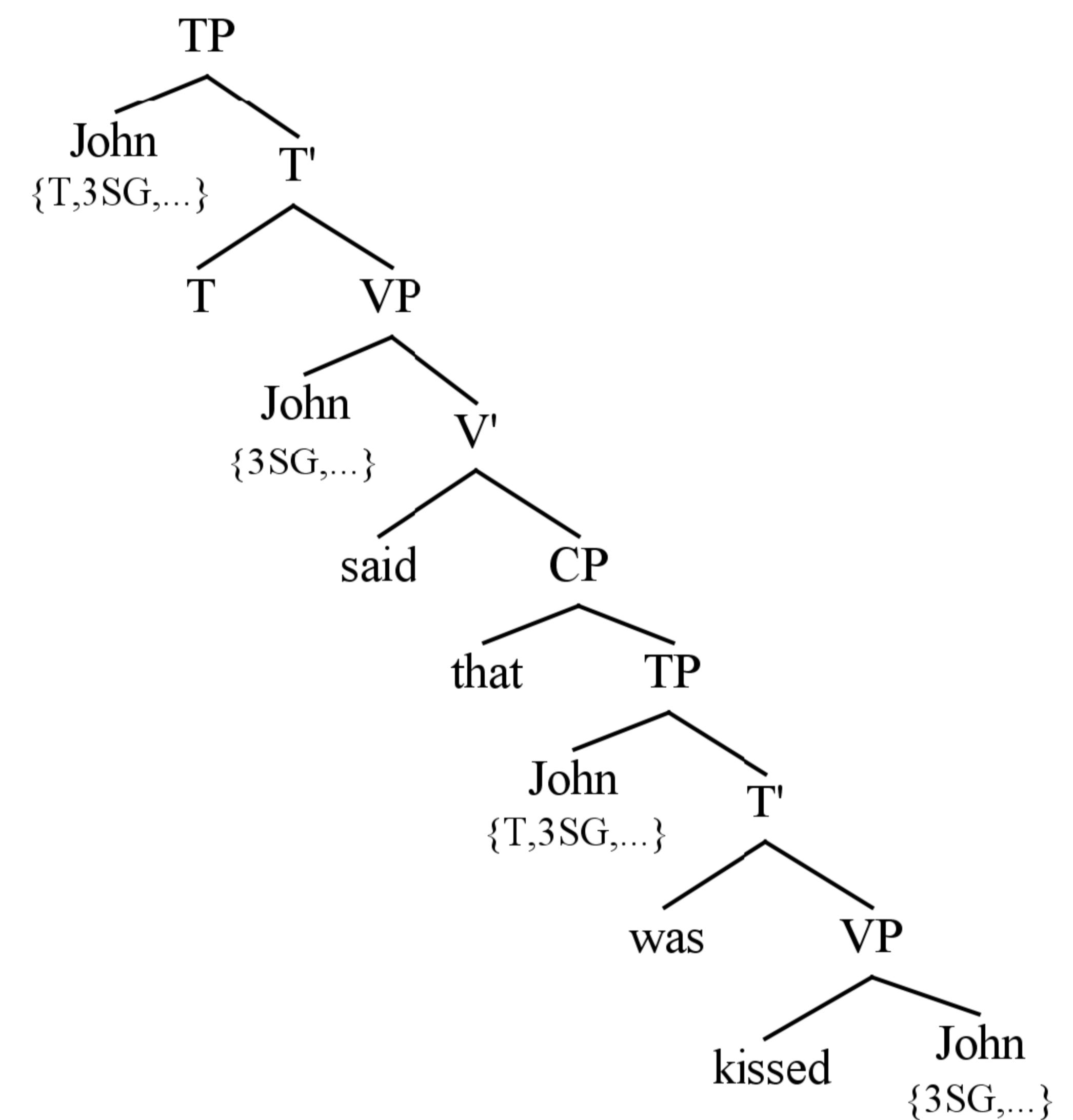
- Derivational step α*
 $K = [TP \text{ was } [VP \text{ kissed John}_1]]$
- Copy*
 $K = [TP \text{ was } [VP \text{ kissed John}_1]]$
 $L = John_1$
- Derivational step α+1*
 $[TP John_1 [T' \text{ was } [VP \text{ kissed John}_1]]]$

Call it the *Derivational Definition of Sameness* (or *Derivational Sameness*, DS, for short).

1.1. THREE MAIN PROBLEMS

- It violates Inclusiveness.
- It is not really explicative (it is a very inductive mechanism).
- Too restrictive: there are cases where elements in the same chain are not identical copies.

A complex case trivially derived by this approach:



4. MISMATCH BETWEEN DERIVATIONAL OPERATIONS AND CHAINS

Consider the following sentence, where only the trace in green is reconstructed.

- (9) [His_i picture of the president]_j seemed to [every man]_i t_k to be seen by him_j t_k to be an intrusion.

Lebeaux (1988): this kind of asymmetry indicates the absence of the relevant R-expression in some traces (or unpronounced copies). Thus, t_k and t_k are two *different* elements in the same movement chain.

If DS is assumed, there is only way to explain this difference: a counter-cyclical operation must introduce the R-expression in a high copy after movement has taken place: e.g., *Late Merger* (Lebeaux 1988), *Wholesale Late Merger* (Takahashi & Hulsey 2009).

However, according to (3), a derivational operation connecting links in a chain **is not essential**: a D head without an NP complement can form a chain with a base-generated full-DP in a higher Case-marked position.

- by him [DP D_{D,3}] to be a real intrusion
- [DP D_{SG,D,3} NP] to be seen by him [DP D_{D,3}] to be a real intrusion
- [DP D_{T,SG,D,3} NP] seemed to every man [DP D_{SG,D,3} NP] to be seen by him [DP D_{D,3}] to be a real intrusion

Thus, a representational definition of Non-Distinctiveness allows to:

- Predict the asymmetry regarding reconstruction between copies: lower elements in a chain may lack some features/constituents.
- Advance a *cyclical* derivation for such asymmetries
- Dispense with additional operations explaining these patterns.