Non-distinctiveness, chain formation and parasitic gaps

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1 Introduction

Maybe the most extended version of $Copy\ Theory$ (Chomsky 1993) involves what Nunes (2004) calls the Copy+Merge approach.

- (1) a. K = [TP was [VP arrested [DP Cosmo]]]
 - b. Copy

K = [TP was [VP arrested Cosmo]]

L = [DP Cosmo]

c. Merge

 $K = [TP \mid DP \mid Cosmo] \mid T$, was $[VP \mid arrested \mid DP \mid Cosmo]$

This kind of approach is strongly supported by **reconstruction patterns**, i.e., cases in which a movement gag displays effects of isomorphism with respect to its filler.

(2) *Which picture of Cosmo did he; buy which picture of Cosmo;?

In this talk, I maintain that **anti-reconstruction phenomena** provides evidence for the approach to syntactic movement briefly sketched in (3).

(3) There is no rule of formation of copies or remerge. (Chomsky 2007:10)

Two things come immediately to mind as requisites for such an approach.

- Ingredient A: a mechanism that allows distinguishing elements forming a movement chain from unrelated constituents.
- Ingredient B: an account of why chains cannot be formed across certain domains.

More explicitly, **Ingredient A** refers to an algorithm that enforces the formation of a chain $C = \{Cosmo^1, Cosmo^2\}$ in a sentence like (4a), but prevents it in (4b).

- (4) a. Cosmo¹ was arrested Cosmo².
 - b. Cosmo¹ arrested Cosmo².

While **Ingredient B** refers to the reason why the chain $C = \{who^1, who^2\}$ is well formed in (5a) but leads to unacceptability in (5b).

(5) a.
$$[_{XP} \text{ Who}^1 \dots [_{YP} \dots [_{ZP} \text{ who}^2]]].$$

b. $*[_{XP} \text{ Who}^1 \dots [_{\text{ISLAND}} \dots [_{ZP} \text{ who}^2]]].$

In this presentation, I will discuss some pieces of the puzzle that is modelling movement without the operations *Copy* or *Remerge*. Particularly, we will see:

- $\bullet~$ An explicit proposal for $\bf Ingredient~A$ that may allow to a bandon the Copy operation under certain assumptions.
- How this system may account for reconstruction and anti-reconstruction phenomena in parasitic gaps.
- That the proposed system derives a condition on A'-movement that gaps inside adjuncts can comply only if they are parasitic gaps.²

2 A proposal for Ingredient A

Two main assumptions: (i) features are ordered pairs $\langle Atr, VAL \rangle$ formed by an Attribute and a corresponding VALUE (Adger & Svenonius 2011); (ii) there are activity features for A'-dependencies (i.e., ω -features).

As there are no privative features under these assumptions, all distinctive behaviour between two constituents is because they have different features, or opposing values for a certain feature.

(6) a. [DP] the neighbour $] = \{\langle \kappa, \emptyset \rangle, \langle \text{Number,SG} \rangle, \langle \text{Person,3} \rangle, ... \}$ b. [DP] which neighbour $] = \{\langle \kappa, \emptyset \rangle, \langle \omega, \emptyset \rangle, \langle \text{Quant,WH} \rangle, \langle \text{Number,SG} \rangle, \langle \text{Person,3} \rangle, ... \}^3$

In previous work (Muñoz Pérez 2017), I proposed that Non-Distinctiveness, the sameness relation between chain-members under Copy Theory, may be defined as an asymmetric comparison between the feature-values of the labels of two constituents.

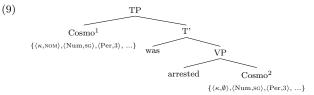
(7) Non-Distinctiveness

A constituent β is non-distinct from a constituent α if for every feature-value of β there is an identical feature-value in α .

This definition supposes a representational algorithm of chain formation as the following.

- (8) Two constituents α and β are part of the same chain if:
 - a. α c-commands β ,
 - b. β is non-distinct from α ,
 - c. there is no δ between α and β such as β is non-distinct from δ , or δ is non-distinct from α .

In a sentence like (4a) both occurrences of Cosmo should form a single chain $C = \{Cosmo^1, Cosmo^2\}$.

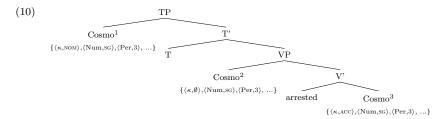


While in (4b), the overt occurrences of *Cosmo* pertain to different chains $C_1 = \{Cosmo_1, Cosmo^2\}$ and $C_2 = \{Cosmo^3\}$.

¹Numerical indexes on copies have the only function of distinguishing occurrences, no matter they form a chain or not.

 $^{^{2}}$ I should clarify right now that this account for the islandhood of adjuncts is INCOMPLETE, as it does not work for A-movement, for instance.

³I tentatively follow Rizzi (2004:243) in assuming that wh-features pertain to a Quantificational class



Thus, in a chain CH= $\{\alpha, \beta\}$ in which α c-commands β, β may be underspecified with respect to α .

2.1 What if we abandon the Copy operation?

In that case, we must form chains with base-generated constituents.

The conditions on chain formation in (8) do not constrain the lexico-syntactic form of chain-members. If there is no Copy operation, then the representation in (11) would yield the chain $CH = \{DP^1, DP^2\}$.

(11) $[_{TP} [_{DP^1}]$ The neighbour $[_{T'}]$ was $[_{VP}]$ arrested $[_{DP^2}]$ the neighbour that I met when I moved to my new place]]]]

This unwanted result may be filtered by appealing to **representational economy**. Following and adapting the account of Condition C in Schlenker (2005), I take that the distribution of restrictors in DPs is regulated by a principle of non-redundancy. Unlike Schlenker's *Minimize Restrictors!*, I assume that (i) the relevant principle applies under c-command, and (ii) extends to any type of DP, not only definite descriptions.⁴

(12) Given a DP¹ that c-commands an anaphorically dependent DP², the restrictor in DP² must be as little redundant *as possible* with respect to the restrictor in DP¹.

This principle introduces a ranking of preferences with respect to what kind of restrictor a D^0 must take

- (13) Ranking of minimization of restrictors
 - a. Noun phrase + optional modifiers $[DP D [NP NP_{(e,t)} ADJ_{(e,t)}]]$
 - b. Noun phrase $[_{\mathrm{DP}} \ \mathrm{D} \ \mathrm{NP}_{\langle \mathrm{e}, \mathrm{t} \rangle}]$
 - c. Pronoun (φ -features as restrictor) [DP D_{φ}]
 - d. Bare D^{min/max} (no restrictor)

According to (13), DP² in (11) is the worst alternative to function as DP¹'s gap.

(14) Alternatives for DP^2 in (11) [DP] the P^2 the neighbour P^2 the neighbour that I met...]

Independently required principles also rule out representations like (11), but would not have the "minimizing" effect introduced in (12). For instance, it could be argued that (11) violates the *Full Interpretation Principle*.

(15) Full Interpretation (Chomsky 1986:98)
Every element of PF and LF must receive an appropriate interpretation. None can simply be disregarded. At the level of PF, each phonetic element must be licensed by some physical interpretation.

Since none of the constituents within the relative clause in (11) satisfies Full Interpretation, the sentence should be ruled-out. A similar kind of prediction could also be obtained by appealing to conditions on recoverability of deletion. The effect of this assumption is that the lexical material that may be interpreted in a gap is restricted to what appears in the filler.

2.2 Accounting for some (anti)reconstruction effects

The basic idea is that reconstruction is a phenomenon constrained by the non-redundancy principle in (12) and interpretability requirements. Consider the sentence in (16).

(16) $[_{DP^1}$ The claim that $Cosmo_i$ was asleep] seems to him_i to be $\frac{DP^2}{I}$ correct.

If DP^2 was a copy of DP^1 , this sentence should be ruled-out due to a Condition C violation. This is not what the principle in (12) predicts.

(17) Alternatives for DP^2 in (16) [DP the] > [DP it] > [DP the claim that Cosmo was asleep]THIS ONE!

Since there are no particular semantic conditions on traces of A-movement other than being place-holders for theta-assignment, the best alternative for DP^2 is a $\mathrm{D^{min/max}}$. This type of representation has been previously proposed by Takahashi & Hulsey (2009), although their account relies on countercyclical operations, i.e., Wholesale Late Merger.

(18) $[_{\mathrm{DP}^1}$ The claim that $\mathrm{Cosmo_i}$ was a sleep] $\{\langle \kappa, \mathrm{Nom} \rangle, \langle \mathrm{Number, SG} \rangle, \ldots \}$ seems to him_i to be $[_{\mathrm{DP}^2}$ the $]_{\{\langle \kappa, \emptyset \rangle, \langle \mathrm{Number, \emptyset} \rangle, \ldots \}}$ correct.

Consider the example in (19).

(19) $*[_{DP^1}$ Which picture of George_i] did he_i see $\frac{DP^2}{}$?

This sentence is bad if George and he correfer, so there must be an occurrence of the NP picture of George within $\mathrm{DP^2}$ causing a Condition C violation. I take that this "redundancy" between $\mathrm{DP^1}$ and $\mathrm{DP^2}$ is a precondition to interpret the latter as an anaphoric definite description (i.e., a sort of variable) through $Trace\ Conversion.^5$

(20) Apply Trace Conversion on a DP in the scope of an operator OP if (i) they are members of the same movement chain, and (ii) they have identical NP restrictors (modulo adjuncts).

Since $\mathrm{DP^1}$ needs to form an operator-variable dependency to be interpreted, $\mathrm{DP^2}$ is required to contain the NP picture of George.

(21) Alternatives for DP² in (19)
$$[DP \text{ which}^{\min/\max}] > [DP \text{ what}_{\varphi}] > [DP \text{ which picture of George}]$$
* THIS ONE!

Therefore, interpretability requirements override the non-redundancy principle in (12), which in this sentence leads to a violation of Condition C.

- (22) a. *[_{DP}^1 Which picture of George_i]_{{\langle \kappa, acc \rangle, \langle \omega, Q \rangle, \langle Quant, WH \rangle, ...}} did he_i see [_{DP}^2 which picture of George_i]_{{\langle \kappa, acc \rangle, \langle \omega, Q \rangle, \langle Quant, WH \rangle, ...}}?
 - b. * For what x, x a picture of $George_i$, he_i saw the picture x of $George_i$

- (1) Trace Conversion (Fox 2002:67)
 - a. Variable Insertion: (Det) Pred \longrightarrow (Det [Pred $\lambda y (y = x)$]
 - b. Determiner Replacement: (Det) [Pred λy (y = x)] \longrightarrow the [Pred λy (y = x)]

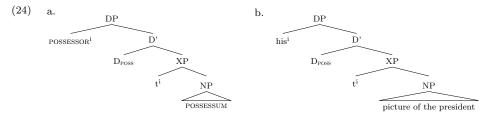
⁴Applying this type of principle to chain-members implies an unification of movement and construal relations that I will not discuss now.

⁵Fox's definition of Trace Conversion is as follows:

Consider a third and last example, taken from Lebeaux (2009:47).

(23) $\left[_{DP^1} \text{ His}_i \text{ picture of the president}_k\right]$ seemed to every $\text{man}_i \ DP^2$ to be seen by $\text{him}_k \ DP^3$ to be a real intrusion.

In this sentence, the NP picture of the president must not reconstruct in DP^3 , but the pronoun his must do so in DP^2 to be bound by the quantifier every man. I take that prenominal possessors involve a DP structure like the one sketched in (24).



Moreover, I take that **DPs** headed by $\mathbf{D_{poss}}$ can only form chains with other **DPs** headed by $\mathbf{D_{poss}}$.⁷ As a consequence, there are only two options for the $\mathrm{DP^2}$ position.

(25) Alternatives for DP² with respect DP¹ to in (23)
$$\underbrace{\begin{bmatrix} DP & D_{POSS} \end{bmatrix}}_{OK} > \underbrace{\begin{bmatrix} DP & his picture of the president \end{bmatrix}}_{ALLOWS BINDING his}$$

As pointed out by Schlenker (2005), violations of the minimization principle are allowed if they introduce new semantic effects. Therefore, picking a redundant occurrence of his picture of the president for DP^2 is allowed.

In contrast, there is no difference whether a full occurrence of the constituent appears in DP³ or not:

(26) Alternatives for DP³ with respect DP² to in (23)
$$\underbrace{[DP \ D_{POSS}]}_{THIS \ ONE!} > [DP \ his picture of the president]$$

So the resulting representation is the one sketched in (27).8

(27) $[_{DP^1}$ His_i picture of the president_k] $_{\{\langle \kappa, \text{NOM} \rangle, \langle \text{Number}, \text{SG} \rangle, \dots\}}$ seemed to every man_i $[_{DP^2}$ his_i picture of the president_k] $_{\{\langle \kappa, \emptyset \rangle, \langle \text{Number}, \text{SG} \rangle, \dots\}}$ to be seen by $\lim_{k} [_{DP^3}$ $[_{DP^3}$ $[_{CK}, \emptyset \rangle, \langle \text{Number}, \emptyset \rangle, \dots]$ to be a real intrusion.

As seen, a system that does not employ the Copy operation captures in an elegant way many anti-reconstruction patterns.

Basically, the whole DP his picture of the president must reconstruct in DP^3 for the pronoun his to be bound by every man. However, this already causes a Condition C violation with respect to him.

3 Reconstruction and anti-reconstruction in parasitic gaps

Movement cannot take place from within adjuncts (28a). However, this seems to be possible if there is already a movement dependency in the matrix structure, i.e., the gap inside the adjunct is "parasitic" on the gap in the main clause (28b).

- (28) a. $*[DP Which paper]^1$ did Elaine review the book $[ADJUNCT without reading t^i]$?
 - b. [DP Which paper] did Elaine review ti [ADJUNCT without reading PGi]?

An immediate question that the this phenomenon raises is whether the gaps tⁱ and PGⁱ in (28b) have the same properties. There are reasons to believe they are different, at least in certain cases. For instance, while standard gaps of A'-movement trigger weak crossover effects (29a), parasitic gaps do not seem to do so (29b).

- (29) a. *Whoi did his; teacher vouch for ti?
 - b. Who i did you gossip about t^i [ADJUNCT despite his; teachers having vouched for PG^i]?

To account for this asymmetry, Lasnik & Stowell (1991) suggest that parasitic gaps do not function as variables. In our terms, this would imply that the difference between tⁱ and PGⁱ in (29b) is that the latter is not required to be interpreted as an anaphoric definite description through Trace Conversion.

Under this assumption, consider the sentence in (30).

(30) $[_{DP}^{1}]$ Which picture of Jerry_i did Elaine destroy $\frac{DP}{DP}^{2}$ $[_{ADJUNCT}]$ after he_i saw $\frac{DP}{DP}^{3}$

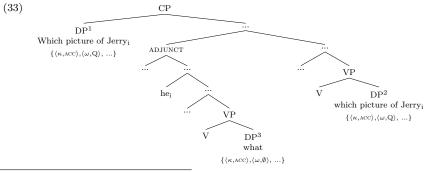
Just as in (19), DP^2 must contain a full occurrence of which picture of Jerry to replace which for a definite determiner and interpret the phrase as a variable.

(31) Alternatives for DP² in (30)
$$\underbrace{\left[_{\text{DP which}^{\min/\max}}\right]}_{*} > \underbrace{\left[_{\text{DP what}_{\varphi}}\right]}_{*} > \underbrace{\left[_{\text{DP which picture of Jerry}}\right]}_{*}$$
This one!

While the same alternatives are available for DP³, there is an important difference: DP³ is not required to function as a bound variable, so there is no need to pick a full occurrence of which picture of Jerry in that position. A bare interrogative determiner $which^{min/max}$ will not work as a first option since DP³ needs to value the φ -features of the v-head within the adjunct. Therefore, "the best pick" for DP³ is a pronoun.

(32) Alternatives for DP³ in (30)
$$[DP \text{ which}^{\min/\max}] > [DP \text{ what}_{\varphi}] > [DP \text{ which picture of Jerry }]$$
*
THIS ONE!

An sketchy tree for (30) is as in (33). This representation predicts the formation of two chains $CH_1 = \{DP^1, DP^2\}$ and $CH_2 = \{DP^1, DP^3\}$, from which only the former is interpreted as an operator-variable dependency. Also, this tree shows that there is no Condition C violation.



⁹I take that some φ -features of the DP, e.g., Number, are intrinsically valued in the NP (or in a functional projection below D).

 $^{^6}$ As discussed in Alexiadou et al. (2007), there are a number of alternatives to maintain that the possessor is generated below D^0 . I remain agnostic regarding the details of the analysis.

⁷This follows from the conditions in (8) under different assumptions, e.g., suppose that $[_{D^0}$ has an unvalued feature $\langle \text{Atr}, \emptyset \rangle$ that attracts an NP to Spec, D_{POSS} , while other elements of the determiner type (i.e., the definite determiner *the*, pronouns, etc.) have a by-default valued version of the same feature $\langle \text{Atr}, \text{DEF} \rangle$.

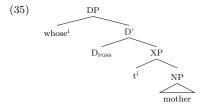
⁸Notice that the same assumptions allow explaining the following sentence, also from Lebeaux (2009):

⁽¹⁾ $*[_{DP}^{1} \text{ His}_{i} \text{ picture of the president}_{k}] \text{ seemed to } \lim_{k} \frac{DP}{2} \text{ to be seen by every } \max_{i} \frac{DP}{3} \text{ to be a real accomplishment.}$

There are certain contexts in which parasitic gaps do reconstruct. As Williams (1990:271) points out, whose-phrases show reconstruction effects: in (34), the pronoun he cannot be interpreted as linked to whose: Williams presumes that this is due to Condition C.

(34) [DP1 Whose, mother] did we warn DP2 [ADJUNCT] before he*, arrested DP3]?

I previously assumed that (i) prenominal possessors are generated below a head D_{POSS} and subsequently move to Spec, D_{POSS} (35), and (ii) that DPs headed by D_{POSS} can only form chains with other DPs headed by D_{POSS} .



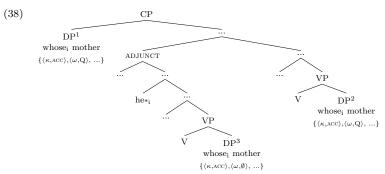
Under this second assumption, the alternatives for DP^2 in (34) are only two. DP^2 must be interpreted as containing a variable, so a complete occurrence of whose mother is required in this position.

(36) Alternatives for
$$DP^2$$
 in (34)
$$\underbrace{\begin{bmatrix} DP & D_{POSS} \end{bmatrix}}_{*} > \underbrace{\begin{bmatrix} DP & \text{whose mother} \end{bmatrix}}_{THIS \ ONE!}$$

As stated, parasitic gaps are not required to be or to contain variables, so DP^3 could in principle have no NP restrictor. However, this DP must at least be able to value the φ of the v probe inside the adjunct. Since a bare D_{POSS} cannot do this, the full DP whose mother must be picked in this position.

(37) Alternatives for DP³ in (34)
$$\underbrace{[DP \ D_{POSS}]}_{*} > \underbrace{[DP \ whose \ mother]}_{THIS \ ONE!}$$

The resulting structure is sketched in (38).¹⁰



Two chains are formed here according to (8): $CH_1 = \{DP^1, DP^2\}$ and $CH_2 = \{DP^1, DP^3\}$. Since DP^2 and DP^3 are identical to DP^1 , Trace Conversion applies in both positions (cf. (20)). The crucial prediction is that the pronoun he will cause a weak crossover effect if interpreted linked to whose.

Consider the pair of sentences in (39).

- (39) a. $[_{DP}^{1}$ Which picture of himself_i] did Cosmo_i destroy $\frac{DP}{DP}^{2}$ [ADJUNCT after Elaine saw $\frac{DP}{DP}^{3}$]
 - b. * [DP1 Which picture of herselfi] did Cosmo destroy $\frac{DP^2}{DP^3}$ [ADJUNCT after Elainei saw $\frac{DP^3}{DP^3}$]

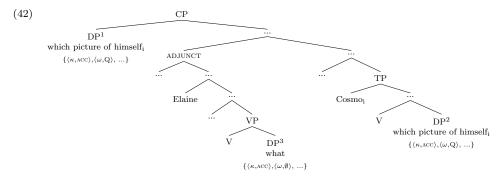
Lets begin with (39a). Only a full occurrence of which picture of himself in DP^2 yields a proper operator-variable dependency.

(40) Alternatives for DP² in (39a)
$$\underbrace{ \begin{bmatrix} \text{DP which}^{\min/\max} \end{bmatrix}}_{*} > \underbrace{ \begin{bmatrix} \text{DP what}_{\varphi} \end{bmatrix}}_{*} > \underbrace{ \begin{bmatrix} \text{DP which picture of himself} \end{bmatrix}}_{*}$$

While a pronoun in DP³ is enough to value the φ -features of v inside the adjunct.

(41) Alternatives for DP³ in (39a)
$$[DP \text{ which}^{\min/\max}] > [DP \text{ what}_{\varphi}] > [DP \text{ which picture of himself}]$$
*

The resulting representation is sketched in (42), in which the anaphor himself in DP² is bound by Cosmo.



With respect to (39b), there is no good alternative at all for DP^2 . Crucially, the NP picture of herself cannot appear in this position as the anaphor herself does not find a proper antecedent neither in DP^1 nor in DP^2 , the only two members of the chain $CH = \{DP^1, DP^2\}$.

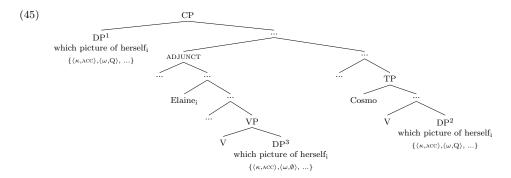
(43) Alternatives for DP² in (39b)
$$[DP \text{ which}^{\min/\max}] > [DP \text{ what}_{\varphi}] > [DP \text{ which picture of herself}]$$

Therefore, the unacceptability of this sentence does not depend on whether there is reconstruction or not inside the adjunct: DP^3 could be either a pronoun or a full DP.

(44) Alternatives for DP³ in (39b)
$$\underbrace{ \begin{bmatrix} \text{DP which}^{\min/\max} \end{bmatrix}}_{*} > \underbrace{ \begin{bmatrix} \text{DP what}_{\varphi} \end{bmatrix}}_{OK} > \underbrace{ \begin{bmatrix} \text{DP which picture of herself} \end{bmatrix}}_{ALLOWS \ BINDING} \ herself$$

The representation in (45) shows that no occurrence of the anaphor herself in the chain $CH = \{DP^1, DP^2\}$ finds an antecedent according to Condition A. On the contrary, the chain $CH = \{DP^1, DP^3\}$ has an occurrence of herself within DP^3 that is bound.

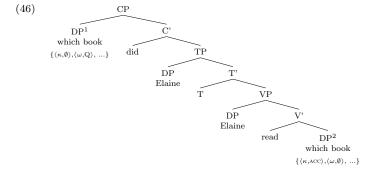
 $^{^{10}{}m I}$ assume that the ω -features of whose percolate to the DP projection.



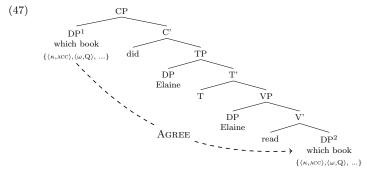
In sum, the proposed system allows to account for puzzling reconstruction and anti-reconstruction patterns in parasitic gaps.

4 What about Ingredient B?

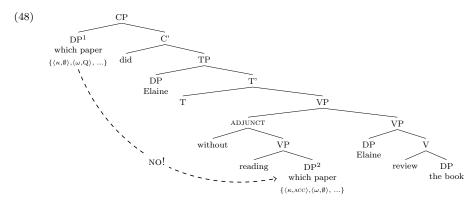
A system that forms chains from base-generated constituents must explain why island restrictions exist at all. At least for adjunct islands, it may be proposed that their encapsulated nature follows from the locality of Agree. That is, when base-generated, a wh-phrase in the specifier of an interrogative complementizer satisfies its ω -feature, but its κ -feature remains unvalued.



The κ -feature of DP¹ in may be satisfied through Agree with DP², as in (47). This way, both DPs satisfy their activity-features.



However, if DP^2 is inside an island, the Probe DP^1 cannot reach it. Therefore, a sentence like the one exemplified in (28a) is unacceptable due to an unvalued κ -feature in DP^1 .



Notice, however, that this kind of restriction applies only to A'-dependencies. Independent restrictions are required to account for A-movement, for instance (see appendix).

5 Concluding remarks

- An inclusion relation between feature-values allows to distinguish between elements forming a chain and unrelated repetitions of a constituent.
- By adopting this view and abandoning the Copy operation, it is possible to account
 for many anti-reconstruction effects. The patterns follow from the interaction of
 representational economy and interpretability requirements.
- However, the proposed system only derives movement restrictions for A'-dependencies.
 Additional assumptions are required to account for other constraints on syntactic displacement.

6 A loose end

Kayne (1983) notices that parasitic gaps within islands inside islands produce unacceptable results.

(49) a. ? [DP The books]ⁱ you should read tⁱ [before it becomes difficult to talk about PGⁱ].
 b. * [DP The books]ⁱ you read tⁱ [before [talking about PGⁱ] becomes difficult].

While an approach to parasitic gaps based on the copy operation can account for this restriction (Nunes 2004), the system advanced here has nothing to say about this contrast.

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