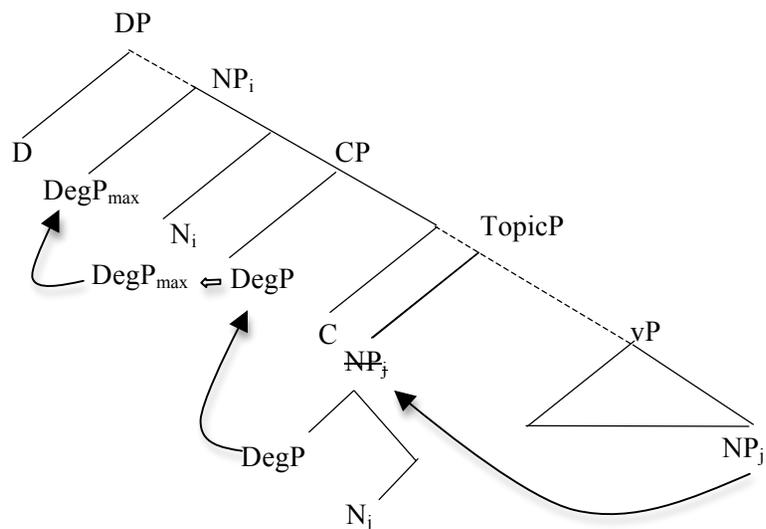


Relativizing two types of degrees¹

I. The proposal

1. It would take us all year to drink the Champagne that you spilled at the party

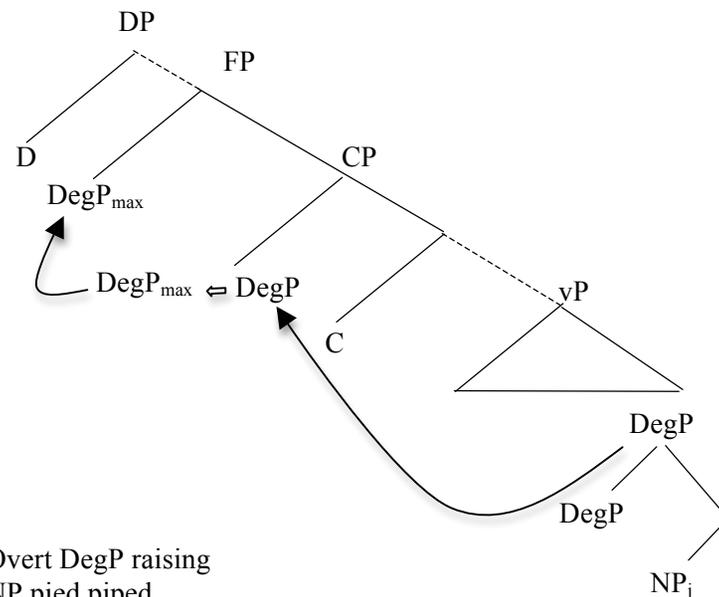


A combined Matching+ Raising derivation:

- NP matching
- **Overt DegP raising**

¹ The research leading to these results has received funding from the European Community's Seventh Framework Program (FP7/2007-2013) under ERC grant agreement n° 224943.

2. John took the books that there were on the table

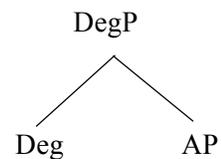


- Overt DegP raising
- NP pied piped

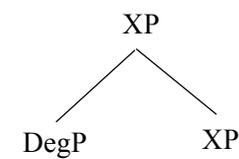
Why? Different type of DegP.

Two types of DegP, Neelman, van de Koot and Doetjes (2004) (NKD):

3. Class-1



- Class-2



II. Background

DegP assumed to modify AP

4. a. He is [DegP too [AP famous]] to leave town.
b. The door is [DegP very [AP red]].
c. He is [DegP as [AP intelligent]] as Bill.
d. I wonder [DegP how [AP rich]] he really is t.
e. I didn't know he was [DegP that [AP impatient]].

DegP taking AP complement

5. a. He is [AP more [AP famous]] than I thought.
b. His paper is [AP less [AP interesting]] than I thought.
c. He is [AP [AP funny] enough] to be my buddy.
d. He is [AP a little [AP impatient]].
e. He is [AP a good deal [AP indebted to his colleagues]].

Why do 1,2 involve DegP?

Carlson (1977, Heim 1987, Grosu and Landman 1998, Herdan 2008)

- Semantics

Truth conditions met when referring to amount (1), not so obvious for (2) (McNally 2008)

- 1 = amount of Champagne spilled
2. = amount of books on the table.

- Complementizer restrictions (Heim 1987)

6. *a. It would take us all year to drink the Champagne which you spilled at the party
*b. John took the books which there were on the table

that compatible with degree trace, *wh*-pronoun requires individual variable = strong NP = definiteness effect in (2). Supported by Polish equatives:

7. W domu jest tyle piwa co/*które wina jest w pracy
At home is as-much beer that/*which is wine at work
'At home there is as much beer as there is wine at work'

- Determiner restrictions (Carlson 1977), Class I OK, Class II bad.

8. a. Class I: The, All, What, That, Any, Every
b. Class II: Five, Most, Several, Many; Some, each, A.

Grosu and Landman 1998:146) "The only determiners that preserve max into the quantification are the universals like *every* and definites like *the*. Hence, these are the only determiners that can head a DP with a degree relative"

- Ability to stack:

9. *a. The one sailor that there was on the boat that there had been on the island died in the explosion.
b. The one sailor who was on the boat who had been on the island died in the explosion.

III. Major assumptions Grosu and Landman (1998).

10. complex notion of degree

$d = \{ |x|, P, x \}$

$|x|$ - value/cardinality

P measure domain, 1 = x: CHMPGN.SPILLED (x),

x - item measured, 1 = CHPGN, 2 = BOOK

11. Maximization of DegP

Takes sets of degrees and chooses one with Max degree.

Let CP be a set of degrees of the form $\langle |y|, P, y \rangle$,

max (CP), the maximal element in CP, is defined by:

$\max (CP) = \langle |\cup \{ y: \langle |y|, P, y \rangle \in CP \}|, P, \langle |\cup \{ y: \langle |y|, P, y \rangle \in CP \}| \rangle$

$\text{MAX}(CP) = \{ \max(CP) \}$ if $\max(CP) \in CP$ undefined otherwise

Maximalization restricts the set of degrees to the singleton set containing the maximal degree

12. Substance Operation

SUBSTANCE takes a set of degree triples and gives you the set of third elements of these triples, the substances:

$\text{SUBSTANCE}(CP) = \{ x: \langle |x|, P, x \rangle \in CP \}$

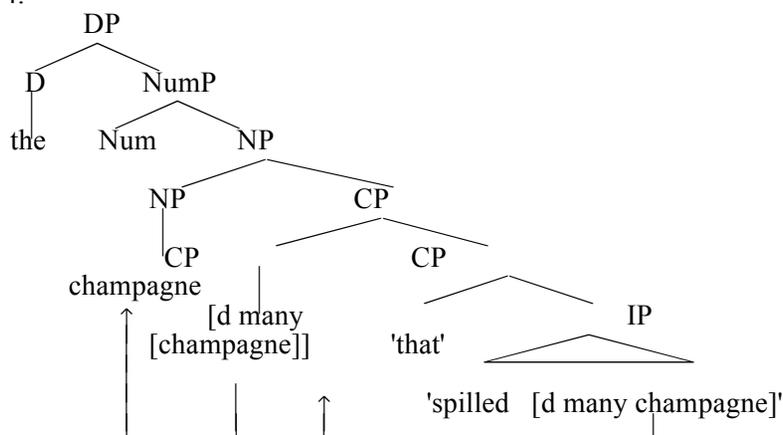
13. Example 2 = CP = $\{ \langle |\cup \{ x \in \text{BOOK}: O(x) \}|, \text{BOOKS}, \cup \{ x \in \text{BOOK}: O(x) \} \rangle \}$

$\{ \cup \{ x \in \text{BOOK}: O(x) \} \}$, where $|\cup \{ x \in \text{BOOK}: O(x) \}| = \max$

This is the singleton set consisting of the sum of the books on the table (whose cardinality is identified inside the CP as max).

Needed for (2), but not (1) repeated here as (14) – ad hoc.

14.



$\{ \langle \sqcup \{x \in \text{CHMPGN:SPILL}(x)\}, \text{CHMPGN}, \sqcup \{x \in \text{CHMPGN:SPILL}(x)\} \rangle \}$

To get comparative:

$\{d: \exists n \exists x [d \leq n, \text{CHMPG}, x] \text{ and } n \geq \sqcup \{x \in \text{CHMPGN:SPILL}(x)\} \}$

IV. Comparison of current proposal with G&L

- Head noun reconstruction does not work for (1)

Idioms:

- 15a. At the morgue, it would take us just a day to get the creeps that a cemetery gives in a year
 A. Literal meaning: creeps are items
 #B. Idiom reading involving the degree of the amount of creeps

- b. At the morgue, it took us just a day to get the creeps that a cemetery gives in a year²

Condition-A

- 16a. It would take us all year to paint the portraits of himself_i that John_i burned in a fit of paranoia
 #A. Type of portrait
 B. painting the actual burned canvas
 #C. paint the amount of portraits.

- b. It would take us all year to paint the portraits of Roger that John_i burned in a fit of paranoia
 #A. Type of portrait
 B. painting the actual burned canvas
 C. paint the amount of portraits

- But forced for (2) (Sauerland 2003),

Condition-C

17. *a. It would have taken us all year to read the letters for John_i that he_i expected there would be
 b. It would have taken us all year to read the letters for John_i that he_i had burned after his girlfriend left

I assume in (1) DegP overtly raises via CP to external NP, internal NP deleted is deleted under identity. In (2) I assume DegP takes NP as its complement, it raises like in (1) but takes NP with it.

Answer: Class-1 DegP no pied piping, Class-2 Forced Pied piping. Compared to G&L the proposal here gives correct predictions as to reconstruction facts.

- Scope differences between comparatives and degree relatives

² It has to be noted that this idiom does lend itself to be relativized with give/get (Svenonius 2005).

(i) At the morgue I get the creeps that only a cemetery gives

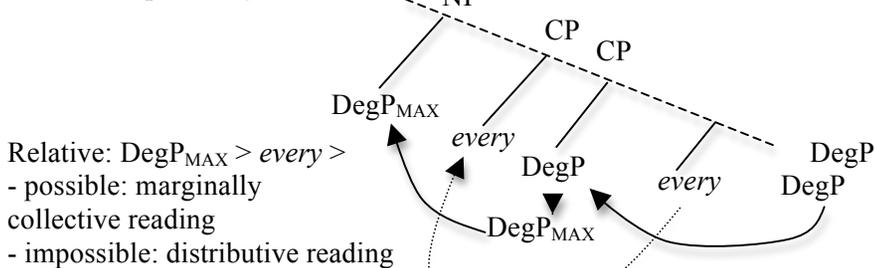
- (18) It would take me all year to drink the champagne that every guest spilled at the party
- A. Amount of champagne drank = sum of the amount of spilled champagne by each individual guest
- #B. Amount of champagne drank= amount of spilled champagne by the guest who spilled the most
- C. Amount of champagne drank= amount of spilled champagne by any of the guests provided everyone spilled equal amounts

- (19) It would take me all year to drink as much champagne as every guest spilled beer at the party
- #A. Amount of champagne drank = sum of the amount of spilled beer by each individual guest
- B. Amount of champagne drank= amount of spilled beer by the guest who spilled the most
- C. Amount of champagne drank= amount of spilled beer by any of the guests provided everyone spilled equal amounts

In G&L this scope asymmetry remains a mystery. In the system adopted here DegP raises overtly in relative clauses, but covertly in comparatives. QR of every will never outscope overt DegP raising out of CP.

In relative clauses DegP raises out of CP overtly, at no point in the derivation does the quantifier scope over every instance of DegP.

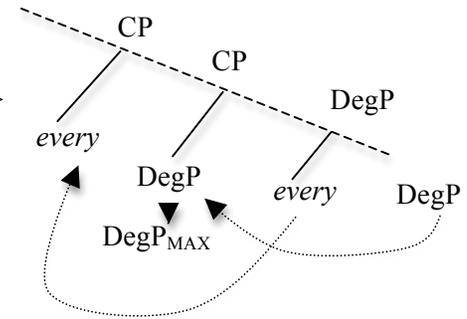
20. (18) scope configuration:



Why no reading $DegP_{MAX} > every$ Kennedy-Heim constraint, only possible: $every > DegP$ = collective reading.

21. (19) Scope configuration.

Comparative: $every > DegP_{MAX} >$
 - possible: distributive reading
 - impossible: collective reading



V. Other Issues:

- Stacking:

One DegP per NP, thus no stacking, this is not necessarily linked to CP internal/external semantics.

Polish restrictive relative clauses do not allow stacking:

- *22. *Lubię tę zupę, co/którą przyniosłeś, co/którą twój chłopak ugotował*
 Like that soup that/which bought that/which your boyfriend cooked
 'I like the soup that you bought that your boyfriend cooked'

- Why does internal NP have to be deleted? LBE violation in (1):

Following Merchant (2001), it is known that ellipsis alleviates LBE violations as indicated in the examples below (strikethrough indicates ellipsis).

- *23. He wants a detailed list, but I don't know [how detailed]₁ he wants a _{t₁} list
24. He wants a detailed list, but I don't know [how detailed]₁ ~~he wants a _{t₁} list~~
- *25. It would take us all year to drink the champagne that you spilled beer at the party
26. It would take us all year to drink as much champagne as you drank beer at the party

VI. Gradability

- why modal blocks G&L's Substance:

27. #a. It took us all year to drink the Champagne that you spilled at the party
b. It would take us all year to drink the Champagne that you spilled at the party

DegP_{MAX} > *Modal* ?

Possible worlds, Kratzer(1981, 1986)

d_{w1} =amount spilled and d_{w2} = amount drunk, and have a mapping where (1) is true iff $d_{w1} = d_{w2}$

but in order to have d_{w1} and d_{w2} there needs to be DegP_{MAX} and *Modal*. To be in a scope relation. In order for that we need them in one CP.

We need to differentiate between **comparative degree relatives**, and just **degree relatives**.

"- Gradable adjectives are type $\langle e; \langle d; t \rangle \rangle$, functions from individuals to sets of degrees (sets of degrees are also called 'scales')

- Scales are triples $\langle D, \langle \mathcal{A}, \psi \rangle \rangle$ with D a set of points, $\rangle R$ a total ordering on D, and ψ a dimension (e.g. 'height')

- Degrees d are therefore shorthand for triples $\langle d, \langle \mathcal{A}, \psi \rangle \rangle$ with d a point on a scale D, $\rangle R$ a total ordering on D, and ψ a dimension. "(Rett 2008)

28. It would take us all year to drink the Champagne that you spilled at the party

4- way ambiguity, **CP is like a gradable adjective:**

A. Amount ~ champagne spilled = amount drunk

ψ (Dimension) = CP

$\langle \mathcal{A}$ Ordering function) = NP = Champagne

B. Type ~ champagne spilled = amount drunk

ψ (Dimension) = CP

$\langle \mathcal{A}$ Ordering function) = NP = Champagne

Plurality is like gradable adjective.

C. Amount/plurality of champagne

ψ (Dimension) = NumP

$\langle \mathcal{A}$ Ordering function) = NP = Champagne

D. Substance identity, champagne from the carpet.

NO DegP.

When CP does not have to be treated as an AP, but NP is gradable.head noun, pied piping by DegP is possible (Morzycki 2009):

29. It would take us all year to make the headway that you did in a week

Only A, B need modal because the reading is comparative need to compare d_1 with d_2 . Reading C is just degree of amount, one instance of d. Just like in:

30. John took the books that there were on the table

As well as in Counterexamples (McNally 2008) to (1) - modal requirement no longer a mystery:

31. We were astonished at the beer they spilled that evening.

32. We lost the battle because we lacked the soldiers our enemy had.

How do we distinguish A, B vs C.?

In comparative readings $d_2 \geq d_1$

33. a. It would take us all year to drink as much champagne as you spilled beer.

b. It would take us all year to drink the Champagne that you spilled at the party

- same amount *or more* vs. readings where there is no comparison:

34. It took us all year to drink the Champagne that you spilled at the party

29, 31, 32

Equatives (Rett (2010:6)). Assuming the semantic value of [as] is

$$[[as]] = \lambda D' \lambda D \lambda d [d = \text{Max}(D) \wedge d \in D']$$

Where: D^C = complement of the set D.

$\underline{D}' =_{\text{def}}$ The smallest D' such that $D^C \subseteq D'$ and D' is a closed set.

35. Context: Hector is 6 feet tall, Natasha is 5 feet tall, Gunnar is 4 feet tall

Hector is as tall as Natasha \rightarrow Hector is as tall as Gunnar *is true iff*

We have:

$$\text{Max}((0,6]) \in (0,5) \rightarrow \text{Max}((0,6]) \in (0,4] \text{ is true iff}$$

$$6 \in [5, \infty] \rightarrow 6 \in [4, \infty] \checkmark$$

36. Gunnar drank as much milk as Hector wine

We have

$$\text{Max}((0, n]) \in (0, k) \text{ is true iff}$$

$$n \in [k, \infty]$$

Meaning iff $k \geq n$ the sentence is true.

Non-comparative degree readings are exhaustive (Herdan 2008), same for Spanish degree relative:

37. Juan no entendi3 lo hermosa que era la

Juan not understood the-neut. beautiful-fem.sg. that was the-fem.sg.

novella

novel- fem.sg.

'Juan did not understand how beautiful the novel was' = extent of the beauty

That is why (2) needs plural or superlative:

38. It would take us a year to read the letters/the only letter/*the letter that he knew there would be in the safe

Either we have a modal in order to trigger comparison or we have exhaustive degree reading triggered by Max on NumP.

VII. CP as AP. Partial labels.

Why cant we have DegP generated in Spec-CP for restrictive relative clauses. Quine (1960) CP = AP in relative clauses.

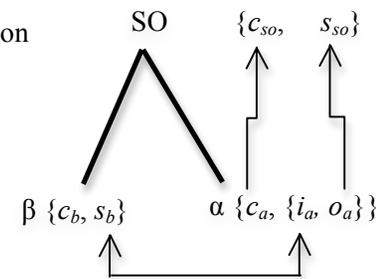
Labels, inspired by Bach (1979) label two membered set:

$$39. l = \{c, s\}$$

Labeling: Donati, C. & Cecchetto, C. (2011):

40. Probing Algorithm: The label of a syntactic object $\{\alpha, \beta\}$ is the feature(s) which act(s) as a Probe of the merging operation creating $\{\alpha, \beta\}$.

41. Full label application



42. Conditions for partially labeled structures:

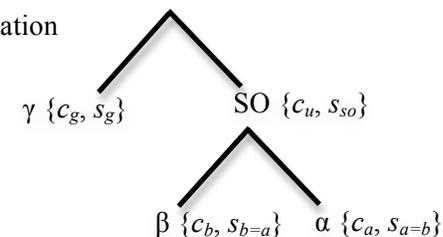
For a given $\{SO\} = \{\alpha, \beta\}$ to be Merged with $\{\gamma\}$ all the following conditions have to be met in order for $\{SO\}$ to receive a partial label $l' = \{c_u, s\}$, where c_u underspecified as either the category $\{\alpha\}$ or $\{\beta\}$, the following conditions have to be met:

A. The semantic type of $\{\alpha\}$ has to equal the semantic type of $\{\beta\}$: $\langle s_\alpha \rangle = \langle s_\beta \rangle$

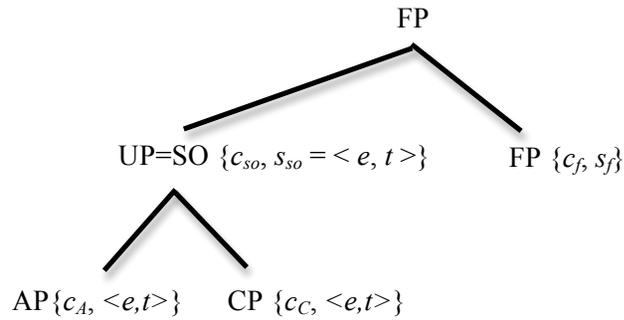
B. For a given $\{\gamma\}$ that is merged with $\{SO\}$, the sub-categorization frame of $\{\gamma\}$ has to be compatible with the category of both $\{\alpha\}$ and of $\{\beta\}$. $\{c_a\} \in \{\text{Subcat } \gamma\}$, and $\{c_b\} \in \{\text{Subcat } \gamma\}$

C. $\{\gamma\}$ has to have a full label, cannot be a phase head, or its projection.

43. Partial label application

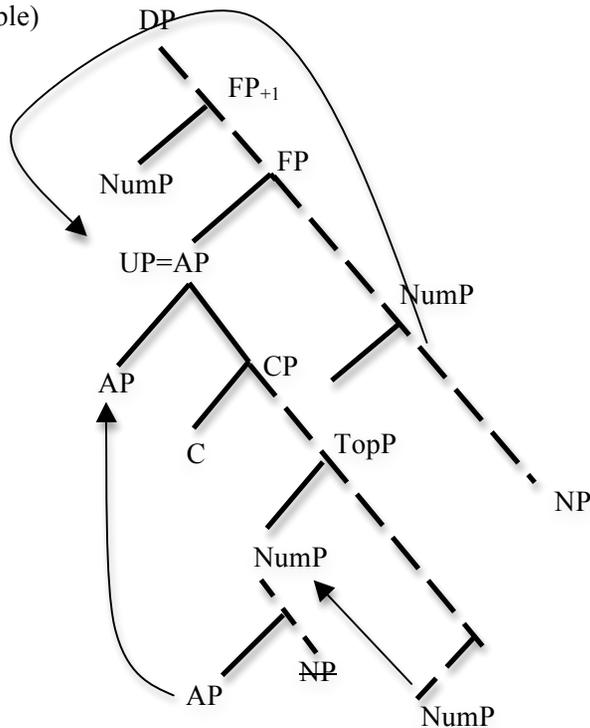


44. Structure of a clausal modifier has been Merged with FP in the functional domain of the modified NP. $C_{SO} = C_{AV} C_C$

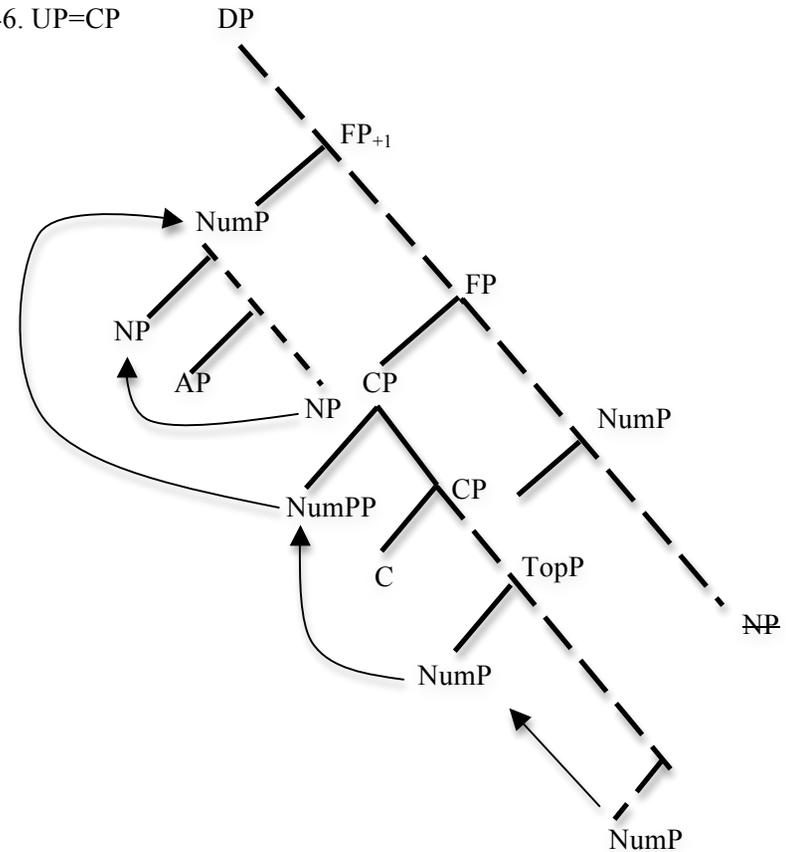


Where FP part of extended projection of external NP, following Cinque (2008). This gives us two derivations

45. UP=AP (non gradable)



46. UP=CP



Identity of ellipsis:

- 47. a. Janek wziął zieloną piłkę i kopnął czerwoną
John took green ball and kicked red
John took a green ball and kicked the red one'
- *b. Janek wziął piłkę i kopnął czerwoną
John took ball and kicked red
'John took a ball and kicked the red one'

VIII. Conclusions

- Degree readings and comparative Degree readings in relative clauses are obtained via raising overtly DegP out of CP.
- There are two types of DegP, two types of DegP relativization.
- CP can be gradable.
- Possible derivation of RC's in line with Cinque (2008), (2010) if we assume null AP.

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