Merge (Late and Parallel) and Agree (Closest and Multiple): A View from Relative Clauses with Coordinated Heads

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Goal

- To examine agreement in relative clauses with coordinated heads ('hydras') with an eye towards answering the following questions:
  - What do such relative clauses tell us about the structure of coordination and the derivation of relative clauses?
  - What determines when Agree between a single Probe and Multiple Goals yields Resolved Agreement *vs*. Agreement with a Single Goal?

Empirical Question

- What happens when the coordinated subject is postverbal ***and*** is modified by a relative clause?

$$\mathbf{VERB_{AGR?}\ [_{DP}\ [DP_1\ and\ DP_2]\ [_{CP}\ REL_{AGR?}\ VERB_{AGR}]\ ]}$$

coordinated subject = coordinated heads

- What happens when the coordinated heads 'share' a single determiner?

$$\mathbf{VERB_{AGR?}\ \ [_{DP}\ [_{DP}\ D_{AGR?}\ NP_1\ and\ NP_2]\ [_{CP}\ REL_{AGR?}\ VERB_{AGR}\ ]\ ]}$$

Preview

- What we find:

  $VERB_{SG/PL}$ [$_{DP}$ [$_{DP}$ $D_{SG/*PL}$ NP_{SG} and NP_{SG}] [$_{CP}$ $REL_{PL/*SG}$ VERB]]

  - The matrix verb can be singular (FCA) or plural (RA);
  - The determiner has to be singular (FCA);
  - The relative pronoun has to be plural (RA).

FCA: First Conjunct Agreement

RA: Resolved Agreement

Preview

- Polish relative clauses with coordinated heads involve **Head Promotion**, irrespective of the relativization strategy (*co* vs. *który*);

- Conjunction head in coordinate structures can be merged **VERY** late (**Late Merge**).

1) a. $[_{\alpha}$ Conj $[_{\beta}$ XP YP]]

b. $[_{\gamma}$ XP $[_{\alpha}$ Conj $[_{\beta}$ ~~XP~~ YP]]] (Chomsky 2013: 46)

c. $[_{\alpha}$ Conj $[_{DP}$ $[_{CP}$ ….. $[_{\beta}$ XP YP]]

Preview

- ***What determines the choice between Single Conjunct and Resolved Agreement?***

- When a single Probe undergoes Agree with two Goals ***across two distinct derivations***, the result is ***agreement with a single Goal***.

- When a single Probe agrees with two Goals ***within the same derivation***, the result can be either ***resolved agreement or agreement with a single Goal.***

Types of Relative Clauses in Polish (Fisiak, Lipińska-Grzegorek & Zabrocki 1978, Pesetsky 1998 , Broihier 1995, Hladnik 2015, Guz 2017, among many, many others)

- Relative Pronoun

2) ten samochód, **który** Janek widział wczoraj
this car.m.sg which.m.sg Janek saw yesterday

- Complementizer

3) ten samochód, **co** Janek widział wczoraj
this car comp Janek saw yesterday

- Complementizer + Resumptive Pronoun

4) ten samochód, **co** **go** Janek widział wczoraj
this car comp RP Janek saw yesterday

(3 and 4 examples from Hladnik 2015: 67)

Structures for Headed Relative Clauses

- The Head Promotion vs. External Head/Matching structure differ with respect to their predictions with respect to reconstruction effects (Vergnaud 1974, Kayne 1994, Bhatt 2000, Bianchi 1999, 2000, Hladnik 2015, De Vries 2002, Hulsey and Sauerland 2006 , Citko 2001, among many many others)

- Head Promotion structure predicts reconstruction effects;
- External Head structure doesn't predict reconstruction effects;

Structures for Headed Relative Clauses

- Standard reconstruction diagnostics involve idiom interpretation, variable binding, binding, scope.

the headway that John made ~~headway~~

a picture of their idol that every teenager cherishes ~~picture of their idol~~

a picture of herself that Mary liked ~~picture of herself~~

two patients that every doctor examined ~~two patients~~

Reconstruction in Slavic Relative Clauses

- Views on reconstruction/structure of relative clauses in Polish (Slavic more generally) differ.
  - Szczegielniak 2004 on Polish: *co*-relatives allow reconstruction, *który*-relatives do not.
  - Hladnik 2015 on Polish, Slovenian (among other Slavic languages): All three types of relatives involve movement: only *co*-relatives involve promotion/allow reconstruction.
  - Giltner 2018 on Russian: *čto* vs. *kotoryj* relatives in Russian; reconstruction behavior not consistent with promotion vs. matching derivation.
  - Gračanin Yuksek 2013 on Croatian: some *što*-relatives are derived by movement and others not: even *što*- relatives with no resumption involve a matching derivation.

Reconstruction in Polish Relative Clauses

- Both *co* and *który*-relatives in Polish allow reconstruction, which calls for a Head Promotion analysis.

- Coordination of relative heads does not affect reconstruction possibilities.

Variable Binding

5) a. Te zdjęcia **swoich** dzieci, **które** **każdy rodzic** trzyma na biurku,
these pictures self's children which every parent keeps on desk
podnoszą go na duchu.
lift him on spirit

b. Te zdjęcia **swoich** dzieci, **co** **każdy rodzic** trzyma na biurku,
these pictures self's children comp every parent keeps on desk
podnoszą go na duchu.
lift him on spirit
'These pictures of their children that every parent keeps on their desk always lift their spirits.'

Principle A Reconstruction

6) a. Ten blog o **swoich podróżach**, **który** **Jan** zaczął dwa lata temu,
this blog about self's travels which Jan started two years ago
zrobił się bardzo popularny.
become self very popular

b. Ten blog o **swoich podróżach**, **co** **Jan** zaczął dwa lata temu,
this blog about self's travels comp Jan started two years ago
się zrobił bardzo popularny.
sefl became very popular
'This blog about his travels which Jan started two years ago,
became very popular.'

Principle B Reconstruction

7) a. *?Ten blog o **jego**$_i$ **p**odróżach, **który** **Jan**$_i$ zaczął dwa lata temu,
this blog about his travels which Jan started two years ago
zrobił się bardzo popularny.
became sefl very

b. *?Ten blog o **jego**$_i$ podróżach, **co** **Jan**$_i$ zaczął dwa lata temu,
this blog about his travels C Jan started two years ago
zrobił się bardzo popularny.
became sefl very popular
'This blog about his travels that/which Jan started two years ago,
became very popular.'

Idiom Interpretation

- *rzucać słowa na wiatr/throw words to the wind/make empty promises*

8) a. **słów** **co** on nie **rzucał na wiatr**
words that he not throw on wind
'empty promises that he did not make.

b. ??**słów** **których** on nie **rzucał na wiatr**
words which he not throw on wind
'empty promises that he did not make' (Szczegielniak 2004: 24)

c. Żałosne są tylko puste **słowa, które** **rzucasz na wiatr**!!!
pityful are only empty words which throw on wind
'Empty promises you make are pitiful.'

d. Słowa i znów **słowa, które rzucasz na wiatr**
words and again words which throw on wind
'Empty promises and again empty promises you make'
(Google search)

Idiom Interpretation

- *mieć węża w kieszeni/lit. to have a snake in a pocket/to be very stingy*

9) Był do tego stopnia skąpy, że zamorzył głodem **węża, którego miał w kieszeni**.
was to this degree stingy that starved hunger snake which had in pocket
Lit.'He was so stingy that he starved a snake in his pocket.' *(Google search)*

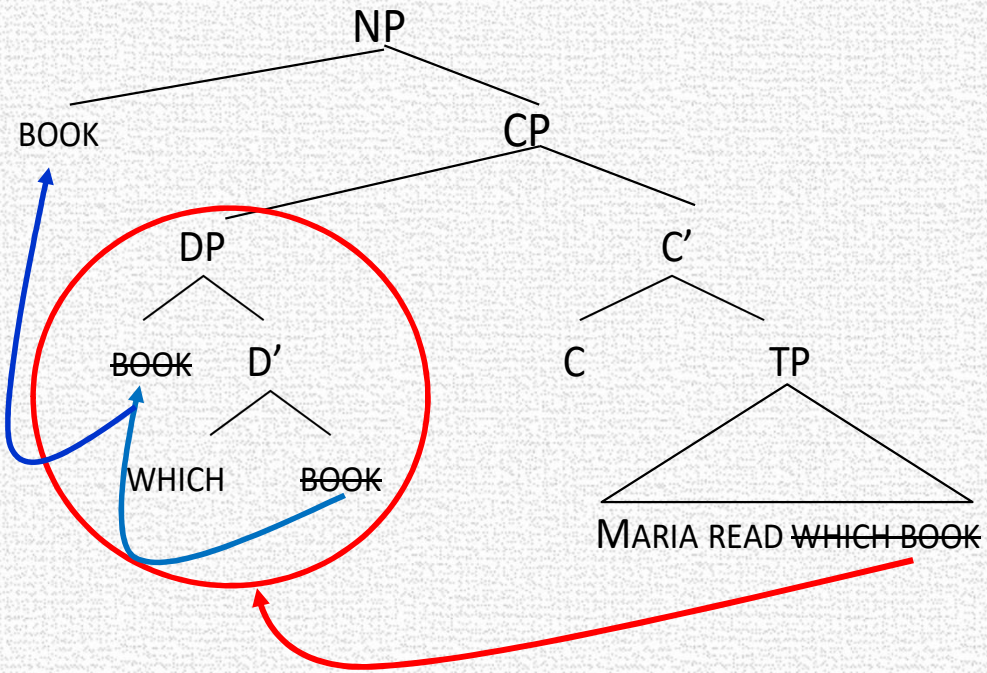
- *ręka rękę myje/lit. a hand washes a hand/*you scratch my back and I scratch yours

10) Państwo nie dostarczyło im żadnych narzędzi, więc posłużyli się tym, co mieli:
state not provided them any tools so used refl this C had:
instynktem przetrwania, twardą dupą i **ręką, która rękę myje**.
instinct survival, hard ass and hand which hand washes
'The state provided them with no tools so they used what they had: survival instinct, badass (attitude) and mutual favors' *(Google search)*

Head Promotion Analysis

książka,	którą	Maria	przeczytała
book	which	Maria	read

‘the/a book which Maria read’



Reconstruction in Relative Clauses with Coordinated Heads: Variable Binding

11) To zdjęcie **swojej** żony i list od **swoich** dzieci, **które** **każdy żołnierz**
this picture self wife and letter from self's children, which every soldier
trzymał w kieszeni munduru, na nic mu się nie przydały.
kept tin pocket uniform for nothing him refl not were.useful
'This picture of his wife and letter from his wife, which every soldier kept in his uniform pocket were good for nothing.'

12) To zdjęcie **swojej** żony i list od **swoich** dzieci, **co** **każdy żołnierz**
this picture self wife and letter from self's children comp every soldier
trzymał w kieszeni munduru, na nic mu się nie przydały.
kept in pocket uniform for nothing him refl not were.useful
'This picture of his wife and letter from his wife, which every soldier kept in his uniform pocket were good for nothing.'

Reconstruction in Relative Clauses with Coordinated Heads: Principle A Reconstruction

13) Ten blog o **swoich** podróżach i album **swoich** zdjęć, **które** **Jan**
this blog about self's travels and album self's pictures which Jan
opublikował dwa lata temu, zrobiły się bardzo popularne.
published two years ago made refl very popular

14) Ten blog o **swoich** podróżach i album **swoich** zdjęć, **co** **Jan**
this blog about self's travels and album self's pictures comp Jan
opublikował dwa lata temu, zrobiły się bardzo popularne.
published two years ago made refl very popular
'This blog about his travels and album of his photos that Jan published two years ago became very popular.'

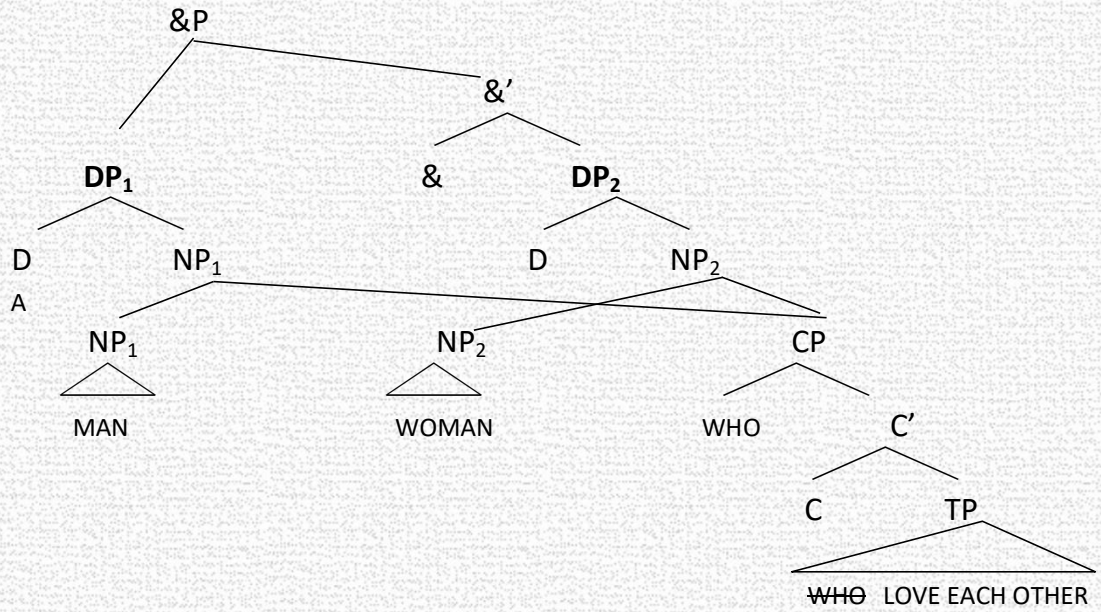
Interim Summary

- Both **co** and **który** relatives in Polish allow reconstruction;
  - Both ***co*** and **który** relatives involve Head Promotion
- Coordination of relative heads does not affect reconstruction
  - Relative heads with coordinated heads also have to involve Head Promotion
- How to get Head Promotion with coordinated relative heads (Conrod and Woo 2018)?
  - DPs not only NPs can be coordinated
  - NPs not DPs undergoes promotion

A Note on Hydras

a man and **a woman** who love each other

(Conrod and Woo 2018)



A Note on Split Antecedents

- Related issues arise with so-called relative clauses with split antecedents (Perlmutter and Ross 1970, McCawley 1982, Link 1984, Zhang 2007, McKinney-Bock 2013, Fox and Johnson 2016, Conrod and Woo 2018)

15) **Every man** and **every woman** who met at the party have left.
(Fox and Johnson 2016: 1)

16) **A man** entered the room and **a woman** went out who were quite similar. (Perlmutter and Ross 1970: 350)

Agreement in Relative Clauses

$VERB_{AGR?}$ $[_{DP}\ D_{AGR?}\ [NP_1$ and $NP_2]\ [_{CP}\ REL_{AGR?}\ VERB]\ ]$

- Agreement on the Matrix Verb
- Agreement on the Relative Pronoun
- Agreement on the Determiner

Matrix Verb Agreement

17) Na konferencję **przyjechały** **doktorantka** **z** **Warszawy**
for conference arrived.**f.pl** PhD.candidate.**f.sg** from Warsaw
i **studentka** **z** **Krakowa**, które spotkały się na lotnisku.
and student**f.sg** from Cracow, which met refl at airport

18) Na konferencję **przyjechała** **doktorantka** **z** **Warszawy**
for conference arrived.**f.sg** PhD.candidate.**f.sg** from Warsaw
i **studentka** **z** **Krakowa**, które spotkały się na lotnisku.
and student**f.sg** from Cracow, which met refl at airport
'For a conference arrived a PhD candidate from Warsaw and a a student from Cracow, who met at the airport.'

$$\mathbf{VERB_{SG/PL}\ [_{DP}\ [DP_{SG}\ and\ DP_{SG}]\ [_{CP}\ REL_{AGR}\ VERB]\ ]}$$

Relative Pronoun Agreement

19) Na konferencję przyjechała **doktorantka** **z** **Warszawy**
for conference arrived.f.sg PhD.candidate.**f.sg** from Warsaw
i **studentka** **z** **Krakowa**, **które** spotkały się na lotnisku.
and student**f.sg** from Cracow, which**.f.pl** met refl at airport

20) *Na konferencje przyjechała [**doktorantka** **z** **Warszawy**]
for conference arrived.f.sg PhD.candidate.**f.sg** from Warsaw
i [**studentka z** **Krakowa,** **która** **spotkała się na lotnisku**].
and student from Cracow, which**.f.sg** met.f.sg relf at airport
'For a conference arrived a PhD candidate from Warsaw and a a student from Cracow, who met at the airport.'

$$\mathbf{VERB_{SG/PL}\ [_{DP}\ [DP_{SG}\ and\ DP_{SG}]\ [_{CP}\ REL_{PL/*SG}\ VERB]\ ]}$$

DP Internal Agreement

21) Na stole leżała/ leżały **ta** **książka** i **gazeta**,
on table lay.f.sg/f.pl this.**f.sg** book**f.sg** and paper.**f.sg**
które Maria przeczytała.
which.f.pl Maria read

22) *Na stole leżała/ leżały **te** **książka** i **gazeta**,
on table lay.f.sg/f.pl these.**f.pl** book.**f.sg** and paper.**f.sg**
które Maria przeczytała.
which.f.pl Maria read
'On the table lay this book and newspaper which Maria read.'

$VERB_{SG/PL}$ [$_{DP}$ $D_{SG/*PL}$ [NP_{SG} and NP_{SG}] [$_{CP}$ $REL_{*SG/PL}$ VERB]]

23) Przed nami **były** **tamten** **brzeg, rzeka** i – **most**.
before us were that bank, river and bridge
'Before us were that riverbank, river and bridge.'
(Kallas 1993: 63, citing Pruszynski)

DP Internal Agreement

- A single prenominal modifier applying to coordinate NPs is *typically* singular (Kallas 1993, Willim 2012, Zbróg 2003: 128, among others)

24) **gorąca/*gorące** kawa i herbata
hot.f.sg/*f.pl coffee.f.sg and tea.f.sg
'hot coffee and tea'

25) **ten/*ci** pan i pani
this.m.sg/*these.m.pl man and woman
'this man and woman'

26) **czyja/*czyje** koszula i krawat
whose.f.sg/*pl shirt.f.sg and tie.m.sg
'whose shirt and tie'

(Willim 2012: 233-234)

DP Internal Agreement

- Plural modifiers are allowed *under certain circumstances* ('when the coordinated nouns form a tight conceptual unit' or 'when the modifier is participial or is an adjective with complex argument structure') (Zbróg 2003).

27) a. **sympatyczni** dziewczyna i chłopak (Zbróg 2003: 116)
nice.m.pl girl and boy

b. **ganiające się/*ganiający** się kot i mysz
chasing.pl refl chasing.m.sg refl cat and mouse

c. **mili/*miły** **dla siebie** mężczyzna i dziadek
nice.m.pl/nice.m.sg for self guy.sg and old.man.sg

DP Internal Agreement

- Heycock and Zamparelli (2005) distinguish between so called *joint* readings (one person) and *split* readings (two people) (see also King and Dalrymple 2004 , Shen 2019 and the references therein)

28) a. [$_{DP}$ My [$_{NP}$ friend and colleague]] is writing a paper.
b. [$_{DP}$ That [$_{NP}$ liar and cheat]] is not to be trusted.

(Heycock and Zamparelli 2005)

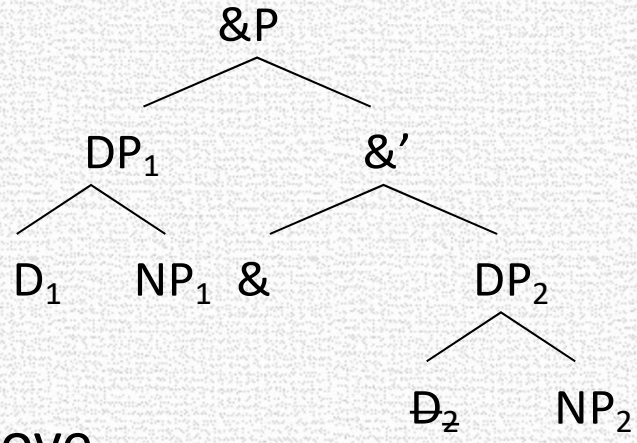
29) a. [$_{DP}$ This [$_{NP}$ man and woman]] are in love.
b. [$_{DP}$ This [$_{NP}$ soldier and sailor]] are inseparable.

(Heycock and Zamparelli 2005: 204)

DP Internal Agreement

- Against Ellipsis (see also Shen 2019)

30) ta kawa i ~~ta~~herbata
this coffee and ~~this~~ tea



31) This man and ~~this~~ woman are in love.

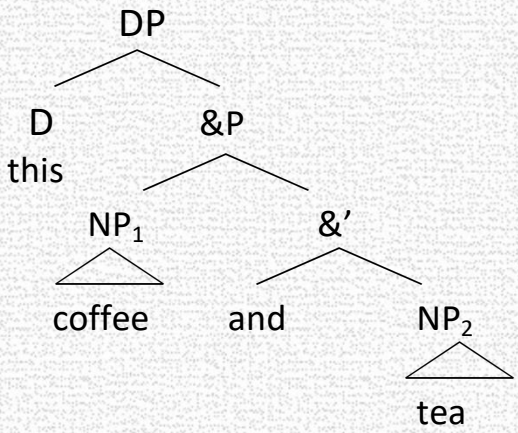
- Determiner ellipsis (sharing) is quite restricted (McCawley 1993, Johnson 2000, Lin 2000, Citko 2006)

32) a. Few men drink coffee and ~~few~~ women ~~drink~~ tea.
b. *This man drinks coffee and ~~this~~ woman ~~drinks~~ tea.
c.*Few men drink coffee and ~~few~~ women drink tea.

DP Internal Agreement

- Single D above the coordination level

33) ta kawa i herbata
this coffee and tea

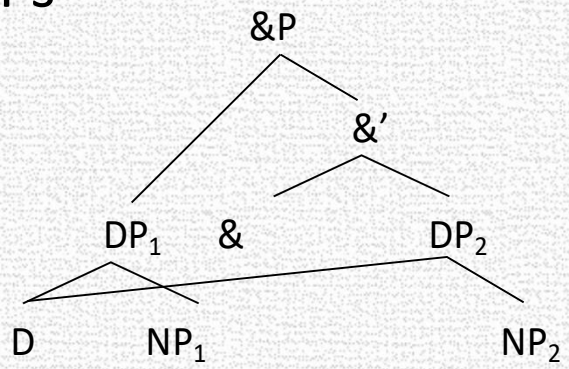


- Plausible for joint readings, less so for split readings

DP Internal Agreement

- Parallel Merge of a single D with two NPs

34) ta kawa i herbata
this coffee and tea



- The presence of two DPs more intuitively captures split readings
  - Two DPs → two individuals
  - ***How to capture single agreement?***

DP Internal Agreement

- D sharing does *not* give rise to plural agreement (see also Shen 2019 for nominal Right Node Raising)

$$[_{DP}\ D_{SG}\ [NP_{SG}\ \textbf{and}\ NP_{SG}]]$$

vs

$$[_{DP}\ [D_{SG}\ (Adj)\ \textbf{and}\ D_{SG}\ (Adj)\ ]\ NP_{SG}\ ]$$

35) **This** tall and **that** short **student/*students** are a couple.

(Shen 2019: 2)

Multivaluation and Derivations

- A single Probe can undergo Agree with Multiple Goals.
  - ***When a single Probe agrees with multiple Goals across multiple derivations, the result is agreement with a single Goal.***
  - ***When a single Probe agrees with multiple Goals within the same derivation, the result can be either resolved agreement or agreement with a single Goal.***

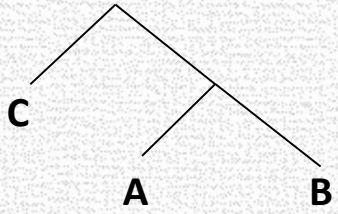
Derivations (Citko and Gračanin-Yuksek 2021)

- A **derivation** D is a sequence of stages $\langle S_0, S_1, S_2, \ldots S_n \rangle$ in a Workspace W, such that for every *i*, $0 \leq i \leq (n\text{-}1)$, S_{i+1} is created from S_i by an application of Merge, and the number of sets that are members of W at S_{i+1} does not exceed the number of sets that are members of W at S_i.

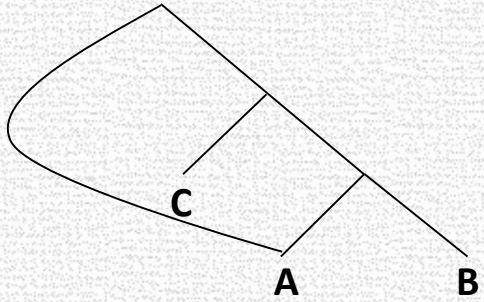
- *If the number of sets that are members of the Workspace at S_{i+1} exceeds the number of sets that are members of the Workspace at S_i, then at S_{i+1} a distinct derivation, D' is initiated.*

Derivations (Citko and Gračanin-Yuksek 2021)

- External Merge of **C** with **{A, B}** → **{C, {A, B}}**

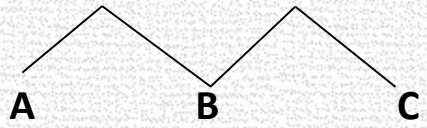


- Internal Merge of **A** with **{C, {A, B}}** → **{A, {C, {A, B}}}**

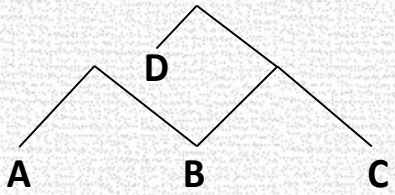


Derivations (Citko and Gračanin-Yuksek 2021)

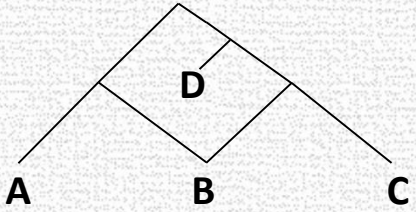
- Parallel Merge C with B → {B, C}



- Merge of **{B, C}** with D → {D, **{B, C}**}



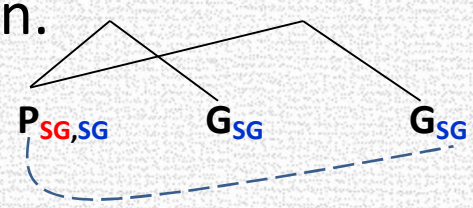
- Merge **{A, B}** with **{D, {B, C}}** → {**{A, B}**, **{D, {B, C}}**}



Multivaluation and Derivations

- Probe merges with $Goal_1$ inside one derivation, agrees with it:

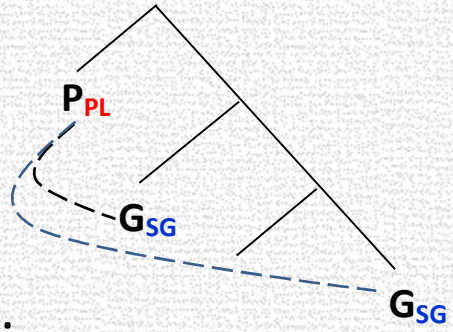
- Probe merges with $Goal_2$ inside a distint derivation, agrees with it in this derivation.



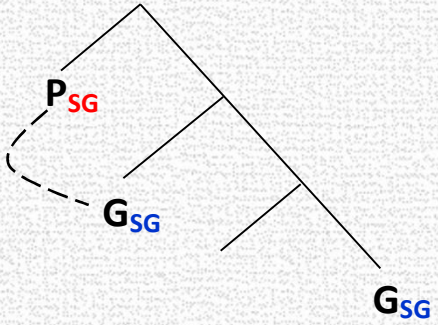
- This gets realized as agreement with a single DP/NP.
  - Closest Conjunct Agreement

Multivaluation and Derivations

- A single Probe can also agree with two Goals simultaneously within the same derivation (Multiple Agree of Hiraiwa 2001)
  - This yields Resolved Agreement.



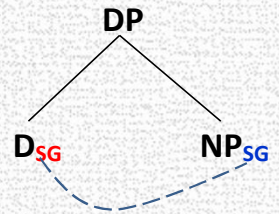
- Agree Closest is also possible.
  - This yields agreement with the closest Goal.



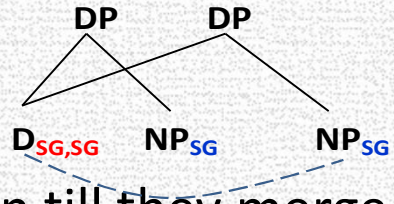
DP Internal Agreement

36) this man and woman

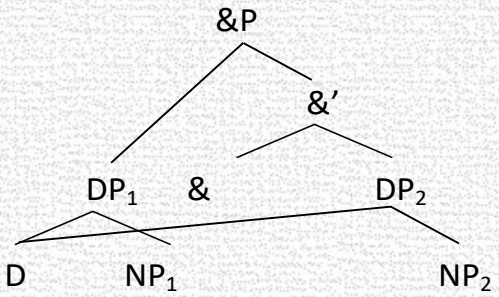
37) ten aktor i gwiazda
this.M.SG actor.M.SG and star.F.SG
'this actor and star'



- D first merges with one NP, and undergoes Agree with it
- D next parallel merges with the other NP *in a separate derivation*



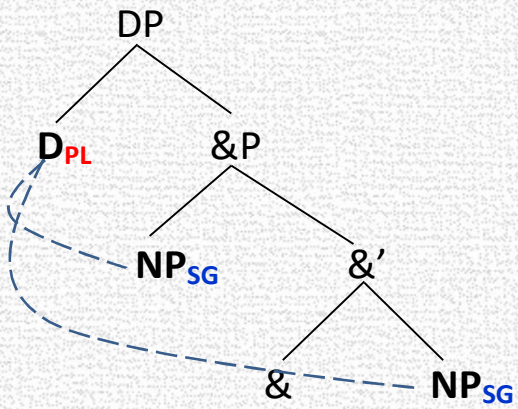
- The two DPs do not become part of a single derivation till they merge with a conjunction phrase.

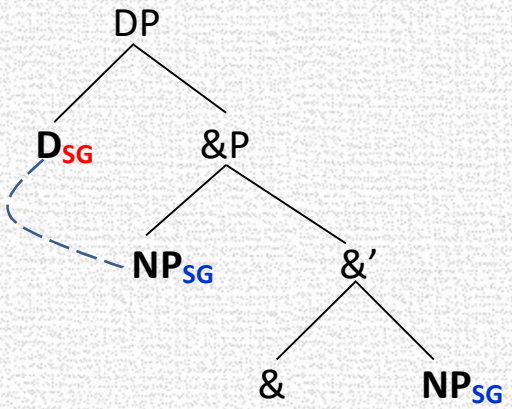


DP Internal Agreement

38) ***these** friend and neighbor

39) **this** friend and neighbor





- semantic considerations?

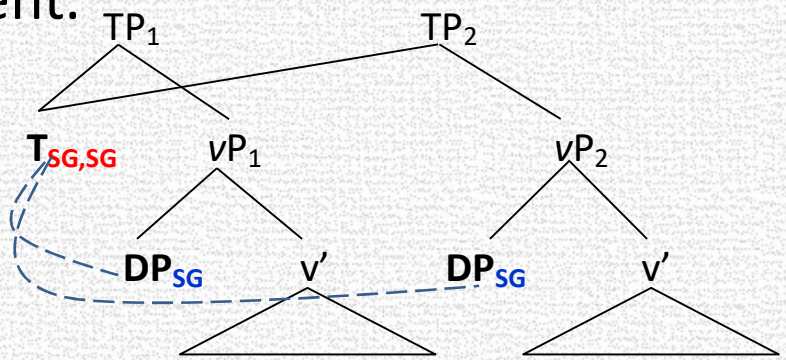
Multivaluation in the Clausal Domain

- If T agrees with two singular DPs ***across two distinct derivations***, only **agreement with a single DP** should be possible.

- If T agrees with two singular DPs ***within the same derivation***, ***either resolved or agreement with a single DP*** should be possible.

Multivaluation in the Clausal Domain

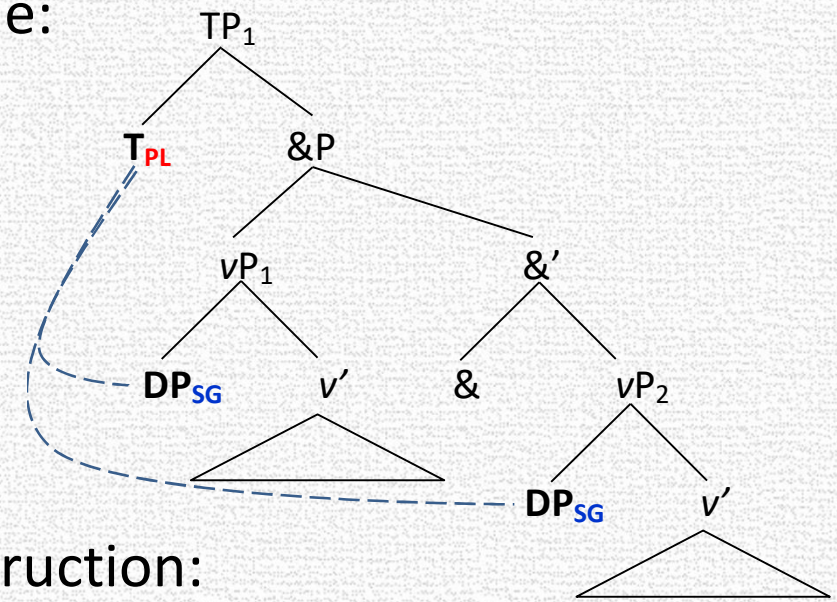
- T agrees with DP_1 within one derivation
- T agrees with DP_2 within another derivation
- The result is singular agreement.



40) Mary **hasn't/*haven't** eaten the cake and John, drunk the beer.

Multidomination in the Clausal Domain

- If T agrees with two singular DPs within the same derivation, resolved agreement is possible:



Kazenin's (2002): pair-list construction:

40) Zwiedzili: Maria Kraków, a Jan Warszawę.
visited.pl Maria Cracow and Jan Warsaw
'Maria visited Cracow and Jan Warsaw.'

Back to Relative Clauses/Putting it All Together

$VERB_{SG/PL}$ $[_{DP}$ $[_{DP}$ D $_{SG/*PL}$ NP_{SG} and NP_{SG} $]$ $[_{CP}$ REL $_{*SG/PL}$ VERB$]$ $]$

- a derivation of relative clauses with coordinated DPs/NPs that allows reconstruction: **HEAD PROMOTION AND LATE MERGE OF THE CONJUNCTION HEAD**

- a derivation of relative clauses with coordinated DPs/NPs that disallows a single determiner with plural agreement: **PARALLEL MERGE OF D WITH TWO NPs**

- a derivation of relative clauses that allows both singular and plural agreement on the matrix verb: **AGREE CLOSEST vs. MULTIPLE AGREE**

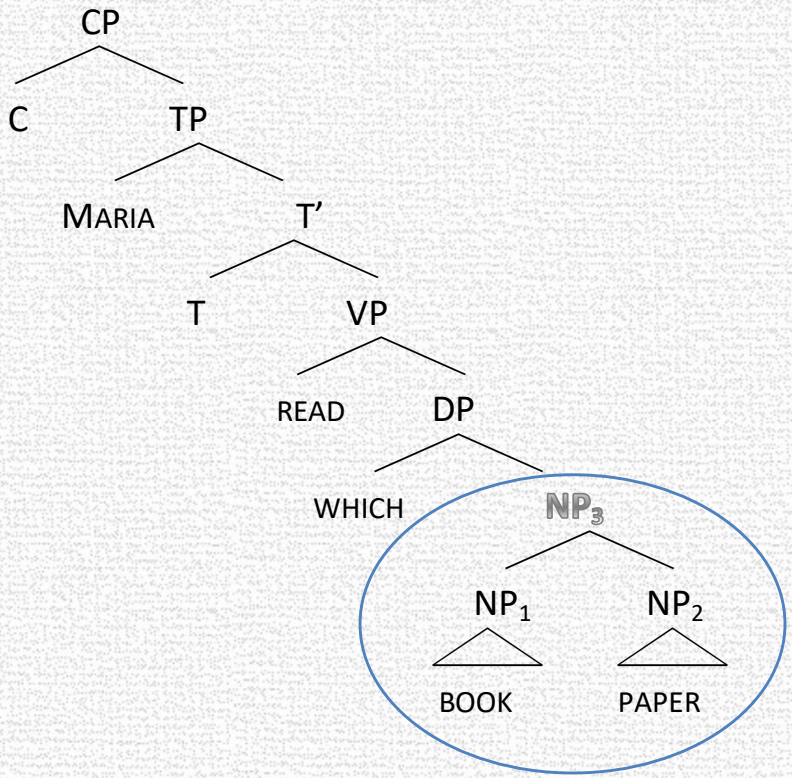
Back to Relative Clauses/Putting it All Together

41) Na stole **leżała/leżały** **ta/*te** książka i gazeta,
on table lay.f.sg/f.pl this.f.sg/*f.pl book.f.sg and paper.f.sg
które/*którą Maria przeczytała.
which.f.pl/*f.sg Maria read
'On the table lay this book and paper which Maria read.'

42) **ta** książka i gazeta, **które** Maria przeczytała
this.f.sg book.f.sg and paper.f.sg which.f.pl Maria read
'this book and paper which Maria read'

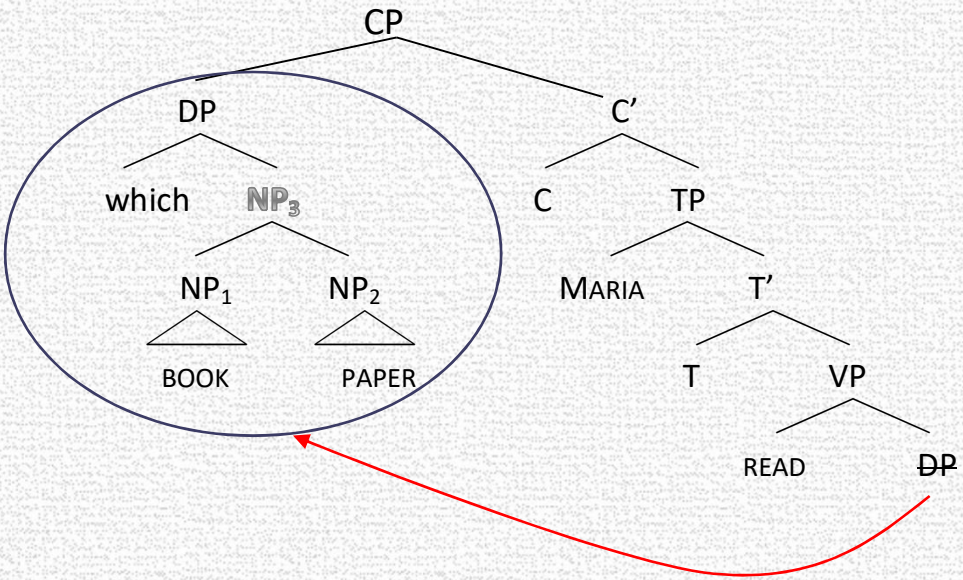
Back to Relative Clauses/Putting it All Together

[$_{DP}$ which [$_{NP}$ [$_{NP}$ book] [$_{NP}$ paper]] starts inside the relative CP; [$_{NP}$ [$_{NP}$ book] [$_{NP}$ paper] starts as an unstable/unlinearizable/unlabelable constituent



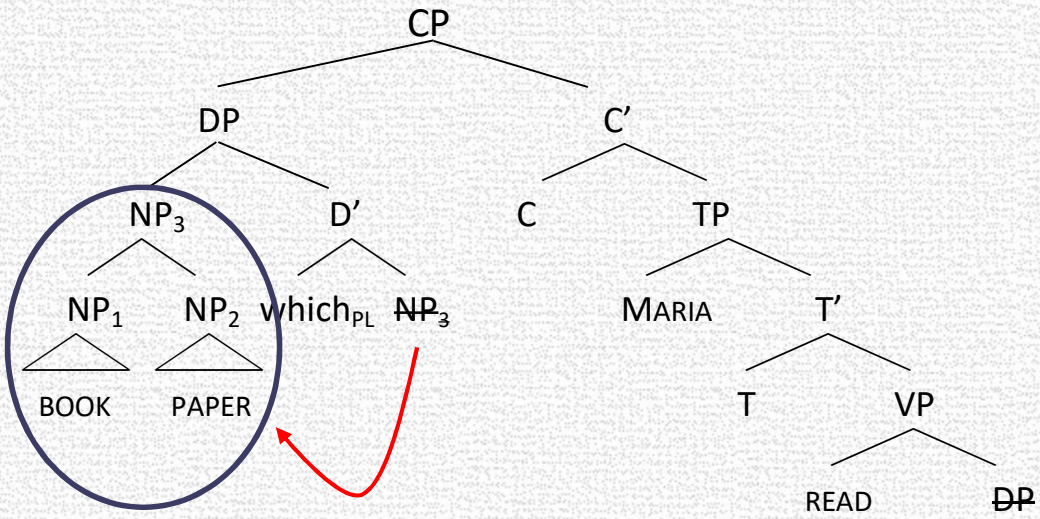
Back to Relative Clauses/Putting it All Together

$[_{DP}$ which $[_{NP}$ $[_{NP}$ book] $[_{NP}$ newspaper]] moves to Spec, CP



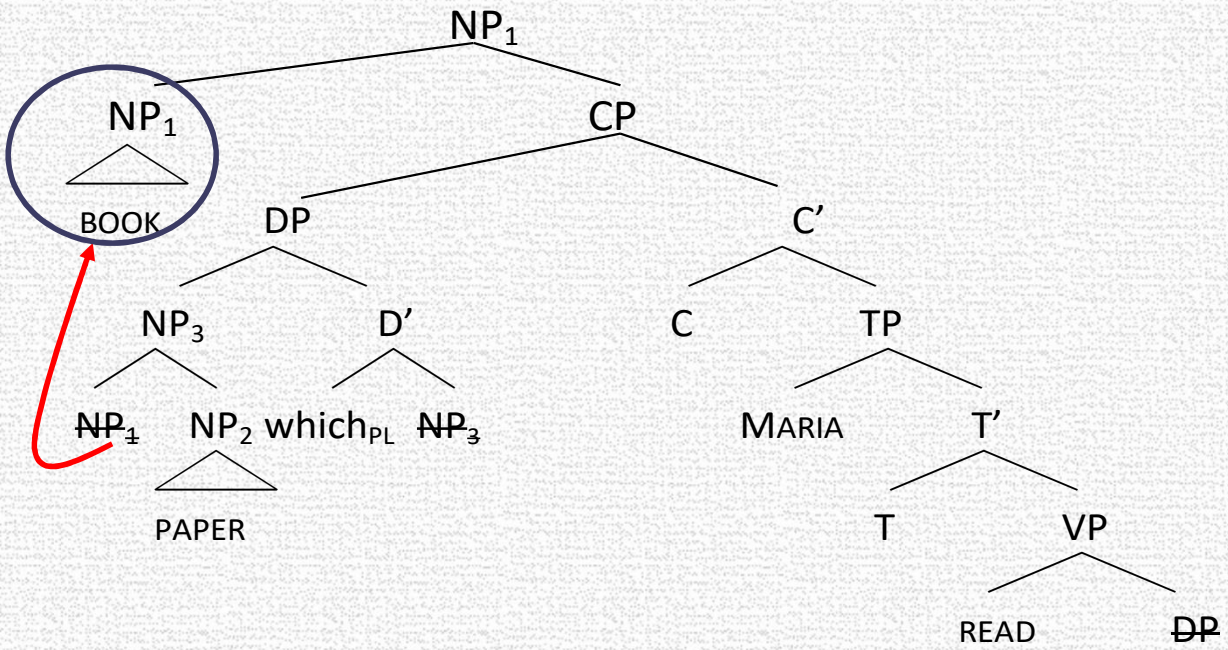
Back to Relative Clauses/Putting it All Together

$[_{NP}\ [_{NP}$ book$]\ [_{NP}$ newspaper$]\ ]$ moves to Spec, DP



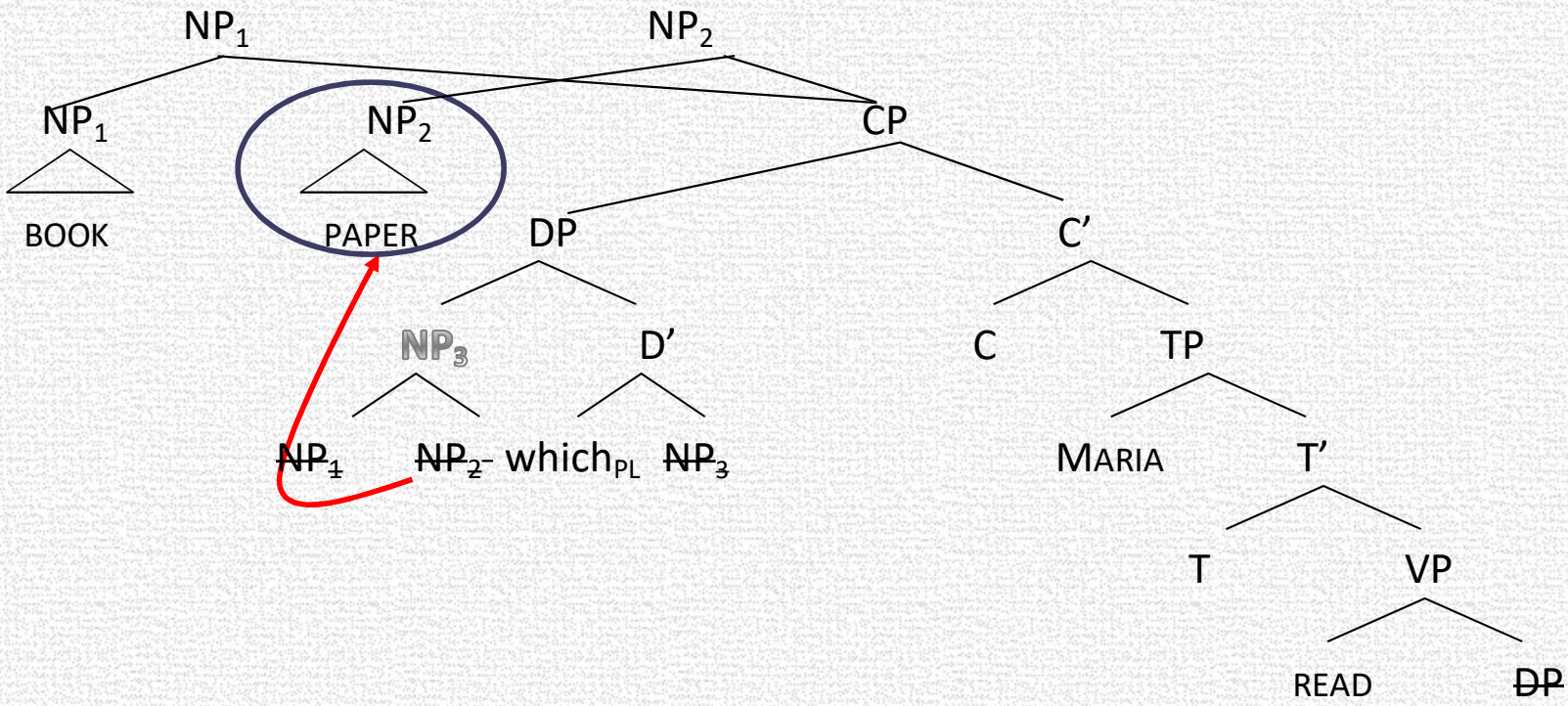
Back to Relative Clauses/Putting it All Together

- NP_1 moves and projects



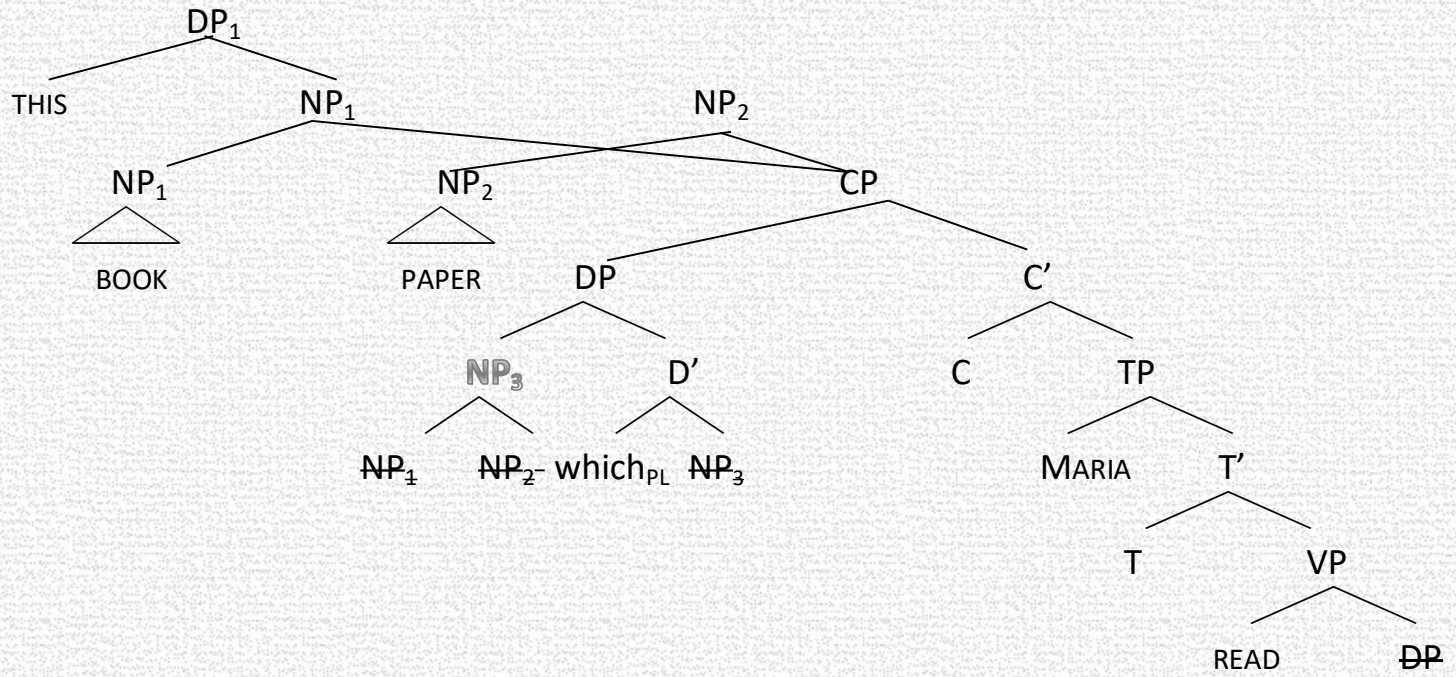
Back to Relative Clauses/Putting it All Together

- NP_2 moves and projects



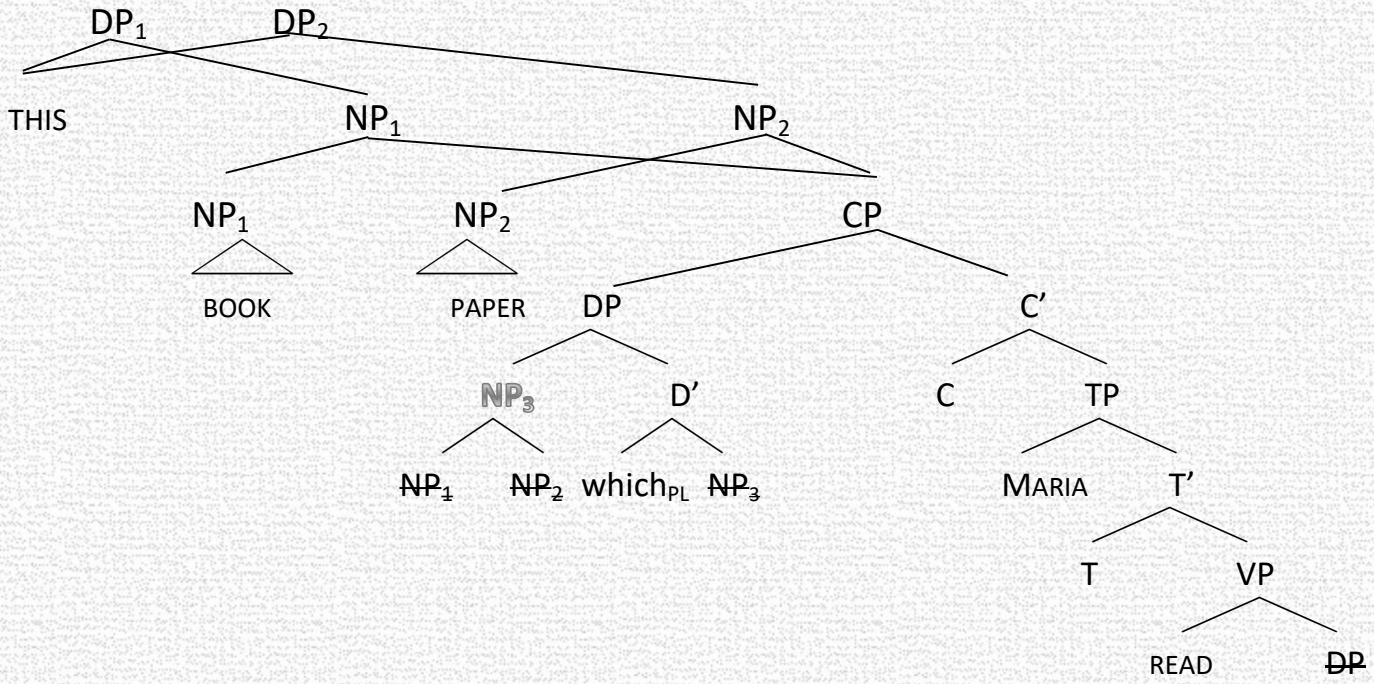
Back to Relative Clauses/Putting it All Together

- D ‘this’ merges with NP_1



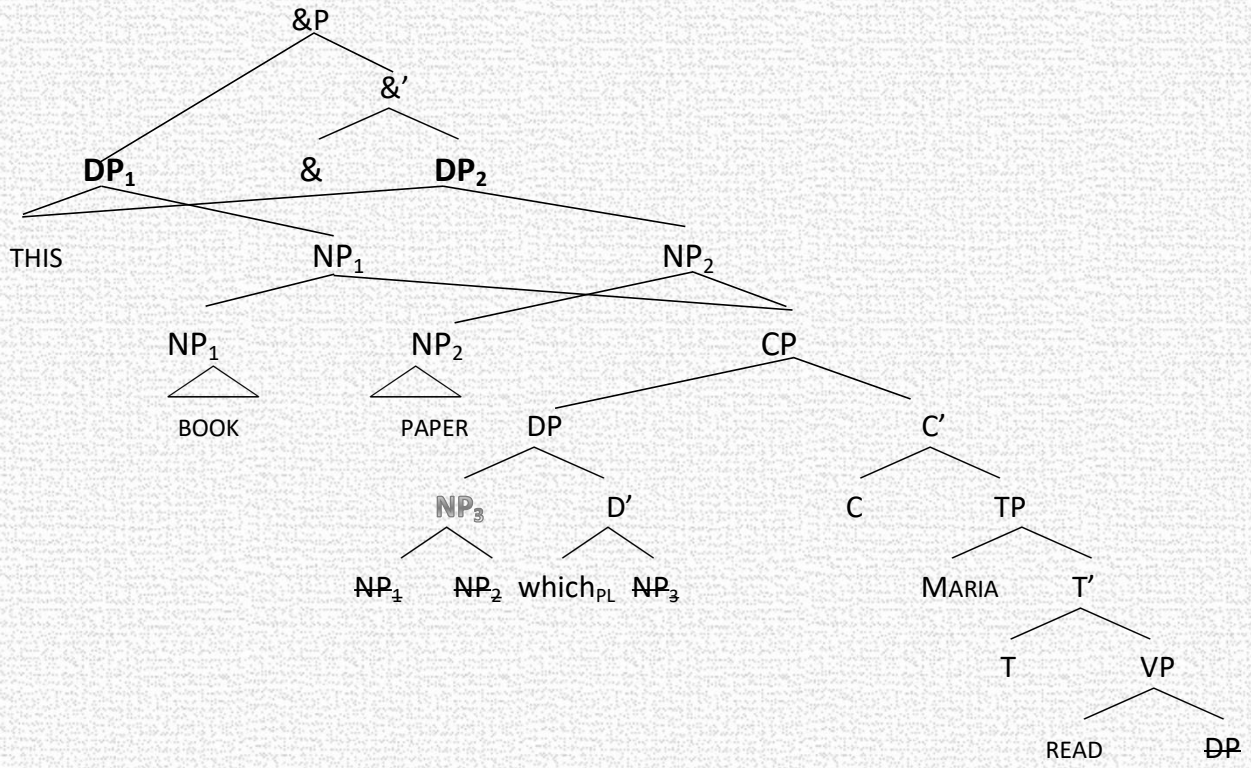
Back to Relative Clauses/Putting it All Together

- D parallel merges with NP_2

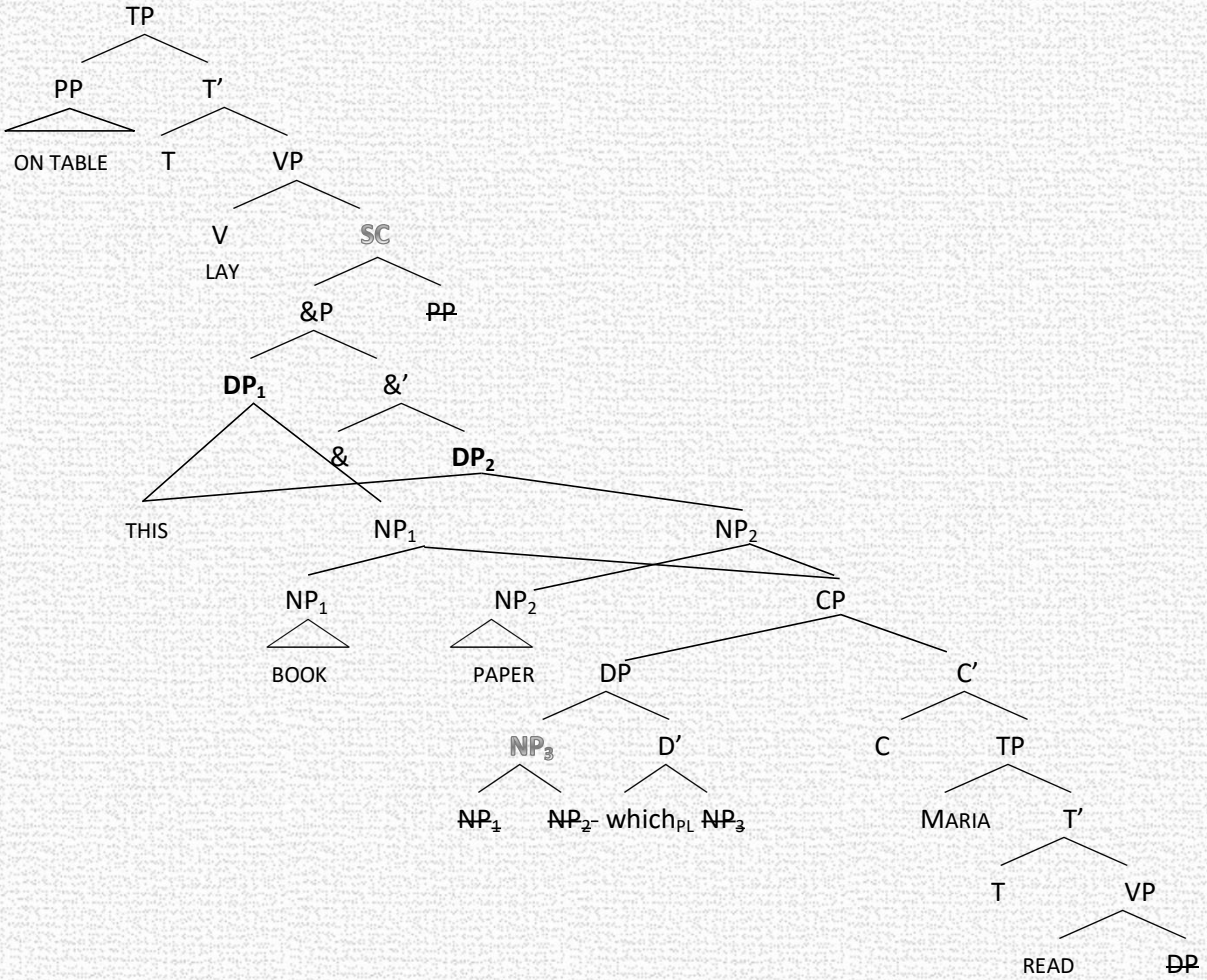


Back to Relative Clauses/Putting it All Together

- DP_1 and DP_2 merge with a conjunction



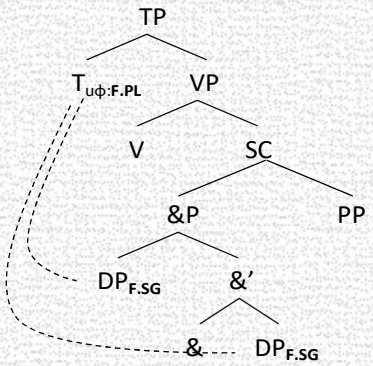
Back to Relative Clauses/Putting it All Together



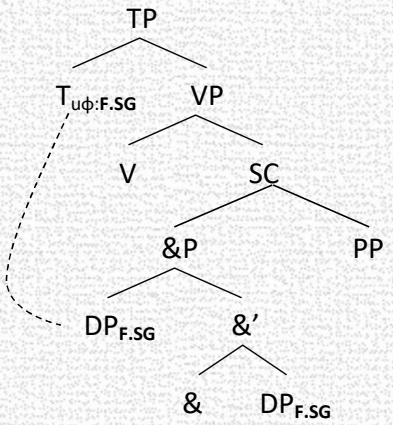
Back to Relative Clauses/Putting it All Together

- The last thing to explain is how it is possible to get both Singular (First Conjunct) and Plural (Resolved) agreement on the matrix verb.
- T can either Agree with both conjuncts or the Closest/Highest one.

Resolved Agreement



First Conjunct Agreement



Conclusions

- Relative Clauses with coordinated heads involve Head Promotion;
- The conjunction is merged late/after Head Promotion.
  - Parallel Merge of a single determiner with two NPs captures singular agreement on D;
  - Agree Closest vs. Multiple Agree captures both singular and plural agreement on the matrix verb.

Conclusions

- Multivaluation can in principle yield either resolved agreement or agreement with a single DP/NP.
  - If a single Probe agrees with multiple Goals across multiple derivations, the result is agreement with a single Goal.
  - If a single Probe agrees with multiple Goals within the same derivation, the result can be either resolved agreement or agreement with a single Goal.

Thank you!

References available on request.

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