

# On sandwiched agreement cases

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# Topics covered

- What is meant by sandwiched agreement
- Conjunct agreement in South Slavic
- Experimental investigation on conjunct agreement
- Theories of conjunct agreement
- Experimental investigation on sandwiched agreement
- Reevaluation

# SANDWICHED AGREEMENT

- Cases of multiple agreement probes on opposite sides of the coordination phrase

E.g.

- two elements of the verbal predicate – auxiliary and participle
- l-participle and n-participle (in periphrastic passives)
- adjective inside the subject and verb
- *Wh*-element inside the subject
- main predicate and secondary predicate
- Complementizer and main verb

# SANDWICHED AGREEMENT

When agreement can be with different parts of &P:

Ich dink **de-s** [ toow en Marie] kump. (Dutch)  
I think **that-3SG** you<sub>3SG</sub> and Marie come<sub>PL</sub>.  
'I think that you and Marie will come.' (Haegeman & van Koppen 2012)

*Complementizer shows CCA;*

main verb shows **resolved** agreement

Včeraj so **bile** [krave in teleta] prodana.  
yesterday aux been<sub>F.PL</sub> [cow<sub>F.PL</sub> and calf<sub>N.PL</sub>] sold<sub>N.PL</sub>.  
'Yesterday cows and calves were sold.'

*Leftward participle shows CCA with NP1;*

*Rightward participle shows CCA with NP2*

# SANDWICHED AGREEMENT

## Quantifiers and *wh*-elements

[Katera [mesta in vasi]] so tekmovale?  
which-N towns-N and villages-F aux.pl compete.F

[Sve [varošice i sela]] su bila evakuisana.  
all-F towns-F and villages-N were-N evacuated-N

*NP-internal element shows CCA with NP1;*

*Participle shows CCA with NP2*

# SANDWICHED AGREEMENT

## Collective adjectives

[Skupaj ležeča [vabila in reklame]] so pristale v smeteh.  
together lying<sub>N.PL</sub> [ invites<sub>N.PL</sub> and advert<sub>F.PL</sub> aux<sub>PL</sub> landed<sub>F.PL</sub> in trash

[Jedne na druge nabacane [testere i svrdla ]] su ležala  
[one above other thrown<sub>F.PL</sub> [saws<sub>F.PL</sub> and drills<sub>N.PL</sub> ]] were lying<sub>N.PL</sub>  
na gomili usred radionice.  
on heap middle workshop

*Adjective shows CCA with NP1;*

*Participle shows CCA with NP2*

Such examples favor a particular analysis of  
conjunct agreement

# CONJUNCT AGREEMENT



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# CONJUNCT AGREEMENT

**Corbett 1983:** South Slavic languages show cases of agreement based on linear order: when two noun-phrases are conjoined, the verb can sometimes agree with the linearly closest one

**Bock & Miller 1991:** English speakers show cases of agreement based on linear order, called ‘attraction’, with the plural complement of noun phrases (e.g. *the key to the cabinets are*)

*How experimentally robust is linear conjunct agreement in South Slavic morphosyntax? Is it distinct from attraction?*



# CONJUNCT AGREEMENT

A number of analyses proposed to model the variability in agreement strategies:

Bošković 2009, Franks and Willer Gold 2014, Puškar & Murphy 2015, Marušič *et al* 2007/2015

Many questions remain open

- What exactly are the facts we need to model?
- Is there variation among South Slavic languages?

These questions were addressed by the EMSS project.  
Some project findings published in Willer-Gold *et al* (2016)

# WG.et.al\_16: METHODOLOGY: ELICITED PRODUCTION (M.et.al 2015)

Participant sees model sentence

Prevod je ovjeren pečatom.  
translation.M.SG. AUX.SG authenticated.M.SG. by.seal

Participant sees replacement noun phrase (&P) displayed onscreen

Molbe i rješenja  
requests.F.PL. and decisions.N.PL.

*Production latency  
measured*

Participant produces new sentence aloud and then clicks mouse

Molbe i rješenja su ovjeren-i/-a/-e pečatom  
requests.F.PL. and decisions.N.PL. AUX.PL

*Responses recorded, classified, tabulated*

# WG.et.al\_16: Methods and Materials

Nine &P combinations of two genders; 6 items per condition

All NPs inanimate and plural; dependent variable = gender agreement on participle

54 distractor items (18 RCs, 18 QNPs, 18 epicene nouns)

Exp 1a: SV configurations (preverbal subjects),  $n=30 * 6$  sites

Exp 1b: VS configurations (postverbal subjects),  $n=30 * 6$  sites

Design and methodology identical across sites with local adaptation of vocabulary and morphosyntax

Participants 18-22y, not linguistics students; native speakers who grew up in region tested (1\*Slo, 1\*Bos, 2\*Cro, 2\* Srb)

# Choosing the Agreement strategy

The 'default' or 'resolution' value for conjuncts with mixed genders is masculine

When a &P has M+F, N+M, etc, and we see masculine agreement, we can't tell if it's default agreement or closest-conjunct agreement

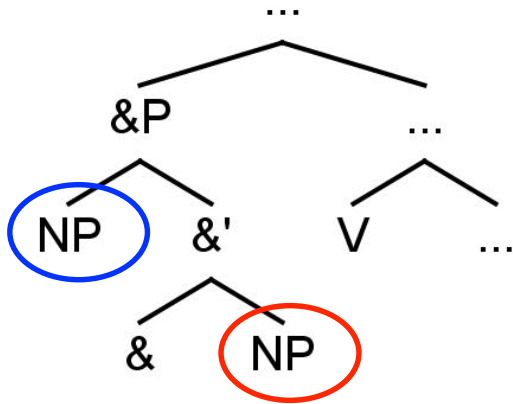
However, in the combinations N+F and F+N, there are three distinct options: first-conjunct agreement (hierarchical), closest-conjunct agreement (linear), and default agreement (resolution/prescriptive)

(In VS contexts, the first-conjunct *is* the closest conjunct)

# Given a Hierarchical &P

SV

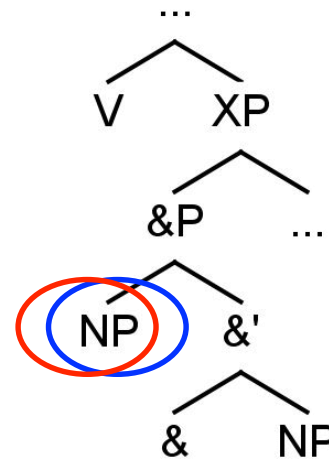
*Linearly closest conjunct*



*Distal conjunct still hierarchically higher*

VS

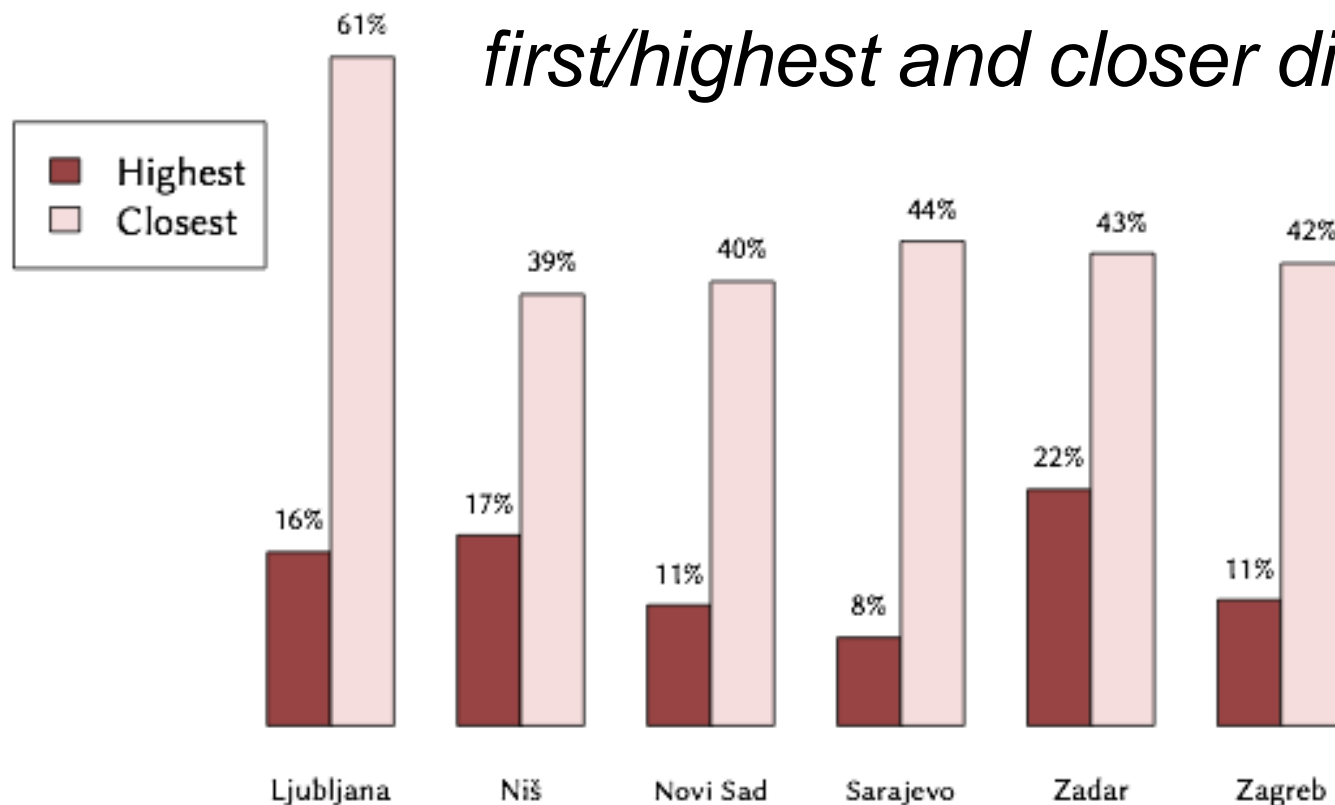
*Linearly closest conjunct*



*Distal conjunct hierarchically lowest*

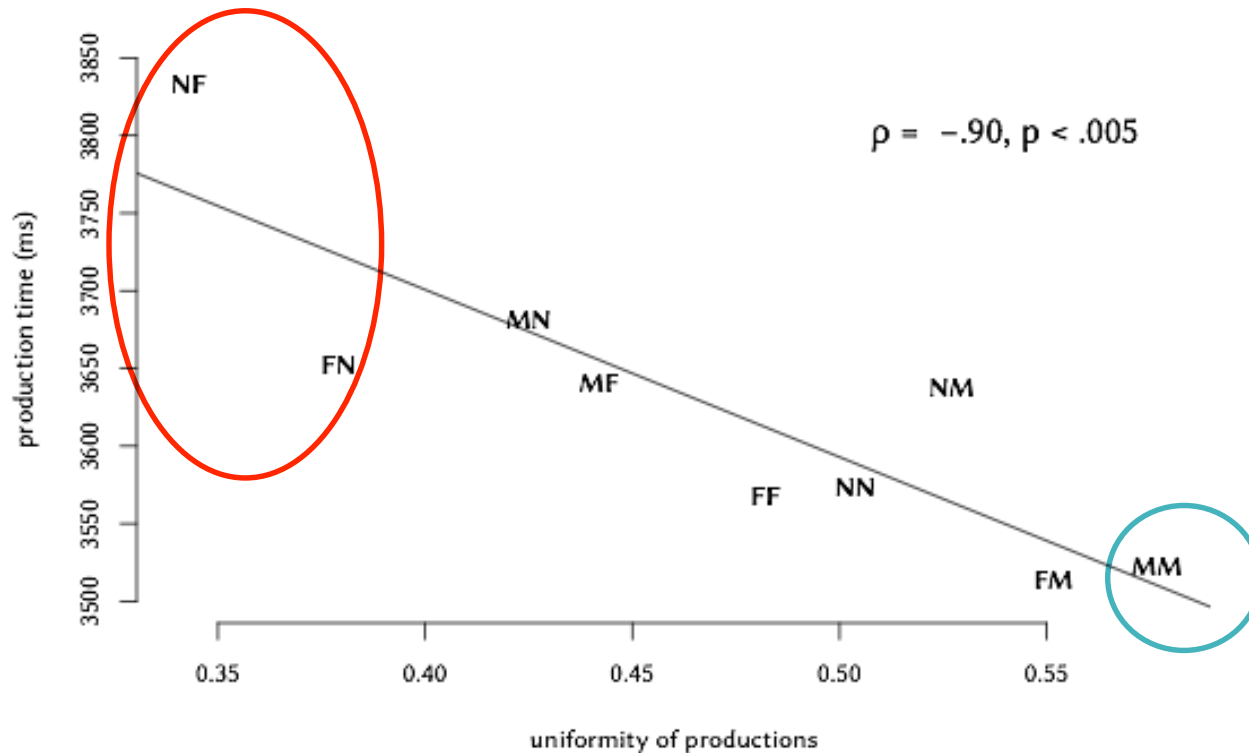
# WG.et.al\_16: LINEAR AGREEMENT IS ROBUST GIVEN &Ps (FN/NF)

*Results for SV condition (where first/highest and closer diverge)*



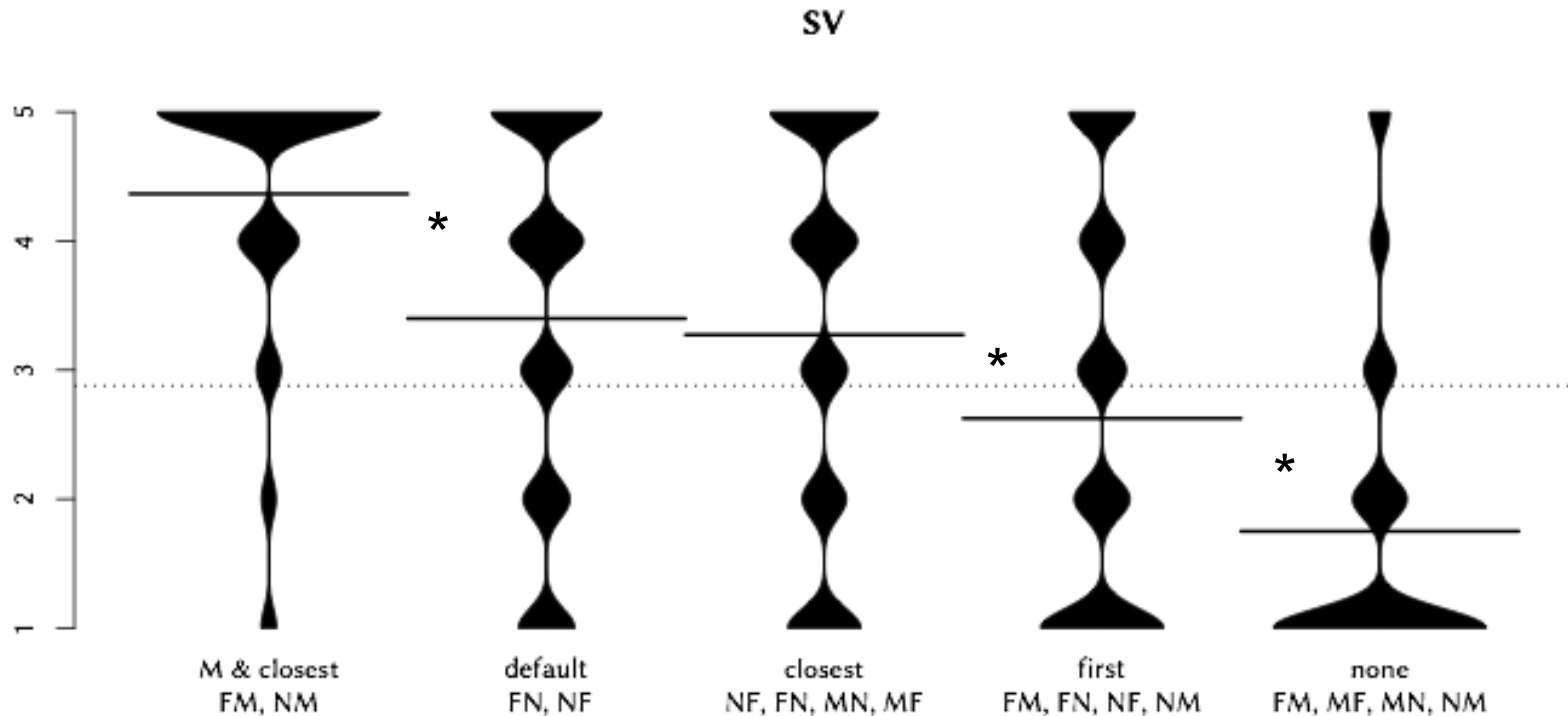
# CHOOSING BETWEEN OPTIONS TAKES TIME

Results for SV condition (where first and closer diverge)



# EXP 2: Acceptability JUDGEMENT of EXP1 STIMULI

Presented with IBEX software;  $n = 20 * 6$  sites





# Interim Conclusions

Linear agreement trumps hierarchical agreement at least three times to one, across all six sites

The rate of linear agreement obtained is much higher than that usually found in attraction studies, suggesting it is a distinct phenomenon

It was judged as equally good as resolved agreement (and resolved agreement cannot be attraction)

We contend that the crucial factor is that the first conjunct in a &P is not the *head* of the &P

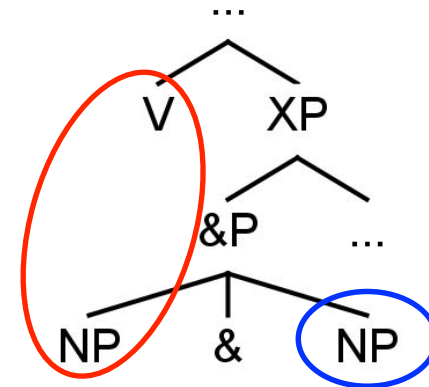
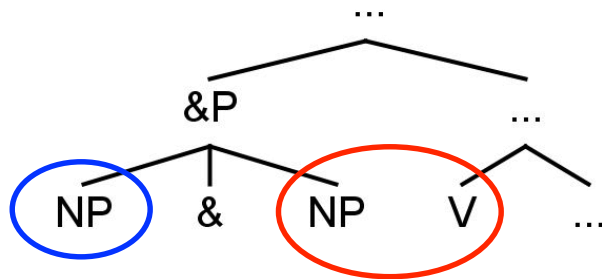
# IF &Ps were flat...

SV

VS

*Linearly closest conjunct preferred*

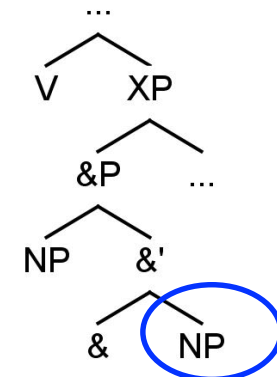
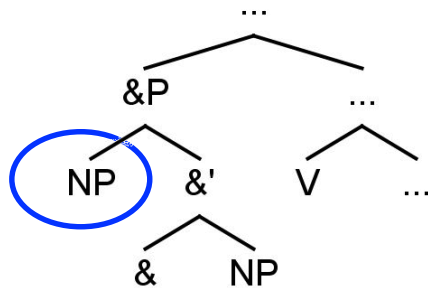
*Linearly closest conjunct preferred*



*Distal conjunct "three nodes away"*

*Distal conjunct "three nodes away"*

## BUT IF HIERARCHICAL...

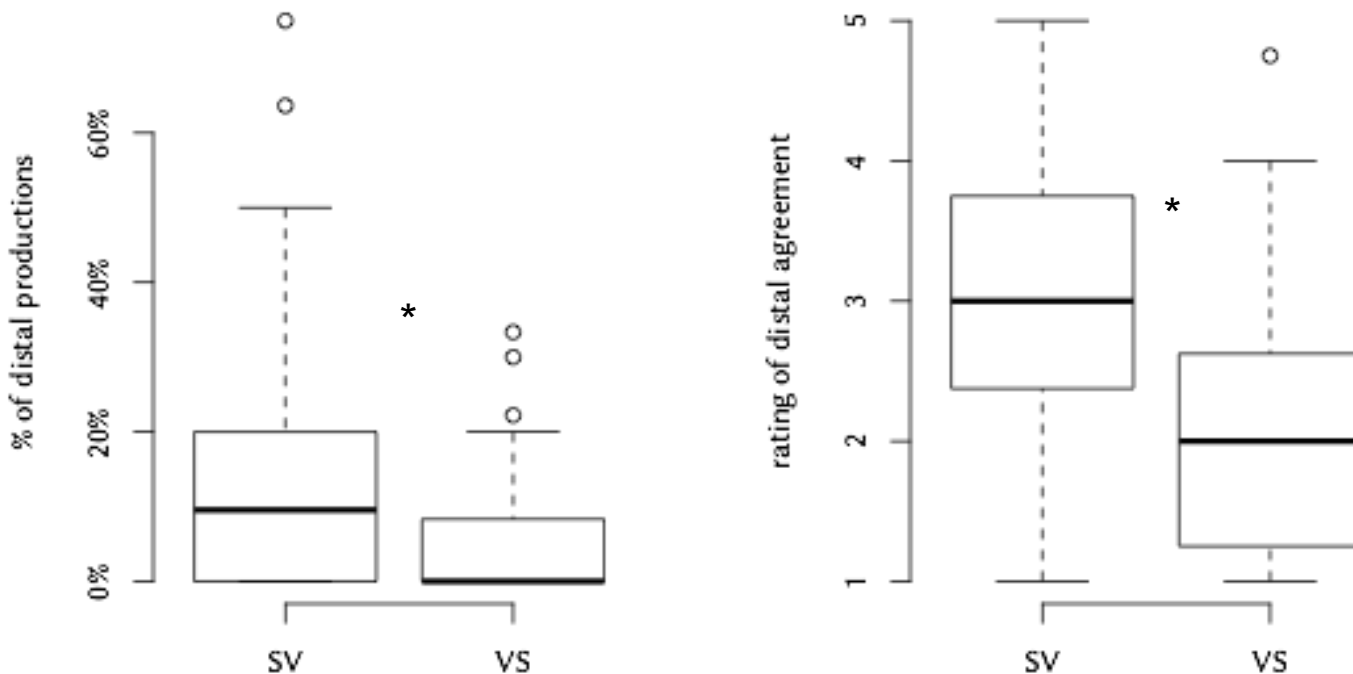


*Distal conjunct still hierarchically higher*

*Distal conjunct hierarchically lowest*

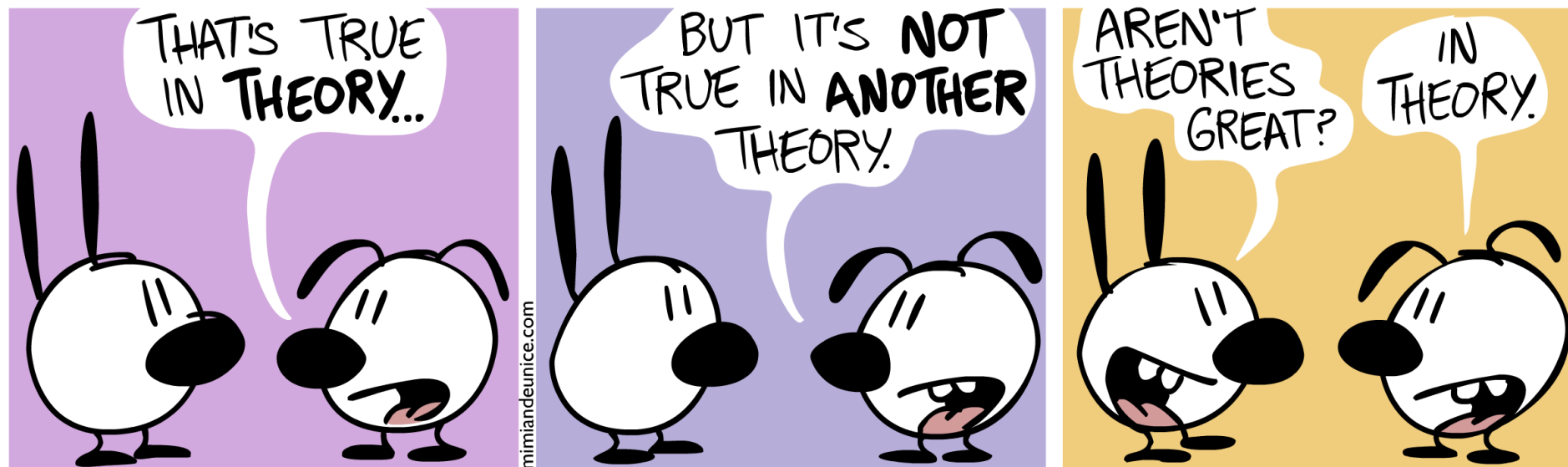
# &PS aren't just flat: DISTAL CONJUNCT AGREEMENT

*If &Ps were just flat, then the distal conjunct in both SV and VS conditions should be equally produced/judged*



*&Ps have internal hierarchical structure*

# THEORY

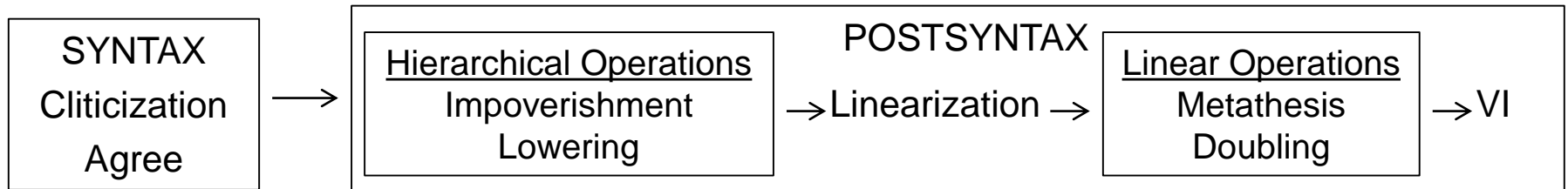


# ESTABLISHMENT OF AGREE

**Agree-Link:** the purely syntactic establishment of a relation between a Probe and Goal(s); Case Licensing of arguments; Potential LF consequences of Agreement

**Agree-Copy:** enacts the valuation of features on the Probe

# the *MORPHOTACTICS* MODEL



Agree-Link within the Syntax  
constrained by Hierarchy, Minimality,  
Boundedness

Postsyntactic Operations include Lowering, Impoverishment,  
Linearization, and Vocabulary Insertion

Hypothesis: The order of these is fixed, but Agree-Copy may  
variably intercalate among them

# Theories of conjunct agreement: Marušič et al (2007/2015)

Key idea: ConjP doesn't have its own gender

Two-step Agree: Agree-Link vs Agree-Copy

A Probe may establish a relation with a Goal, but the actual copying takes place post-syntactically (see also Bhatt & Walkow 2013)

Participles enact Agree-Link with ConjP, but depending on how and when Agree-Copy takes place, different parts of ConjP may be targeted

# Marušič et al (2007/2015): Agree-Copy CHOICE

ConjP has its own Number, but not its own Gender

Speakers who wish to avoid *default* Gender must therefore open up the lid on the ConjP and choose one of the individual conjuncts during Agree-Copy

Key idea: linearization is post-syntactic

If Agree-Copy happens before linearization, HCA results

If Agree-Copy happens after linearization, CCA results

(There's no way to choose a medial conjunct if there are 3)



# Theories of conjunct agreement: Clausal coordination

Simple idea (Aoun, Benmamoun, and Sportiche 1994)

[Krave in teleta] so prodana.

[cow<sub>F.PL</sub> and calf<sub>N.PL</sub>] aux sold<sub>N.PL</sub>

‘Cows and calves are sold.’

Comes from:

[Krave so prodane ] in [teleta so prodana.]

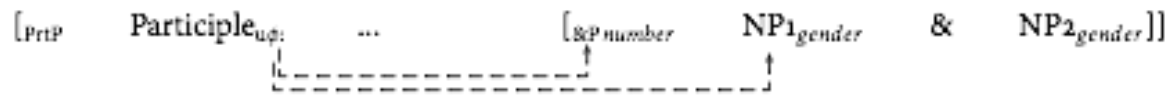
[cow<sub>F.PL</sub> aux sold<sub>F.PL</sub> ] and [calf<sub>N.PL</sub> aux sold<sub>N.PL</sub>]

‘Cows are sold and calves are sold.’

- Munn (1999) shows certain problems with this approach
- Schein (2016) resurrects this approach

# Theories of conjunct agreement: Bošković (2009)

## Multiple Agree



if Probe has EPP: Pied-Piping ambiguity;  
can't move either

Solution: do Agree again, this time with NP2:



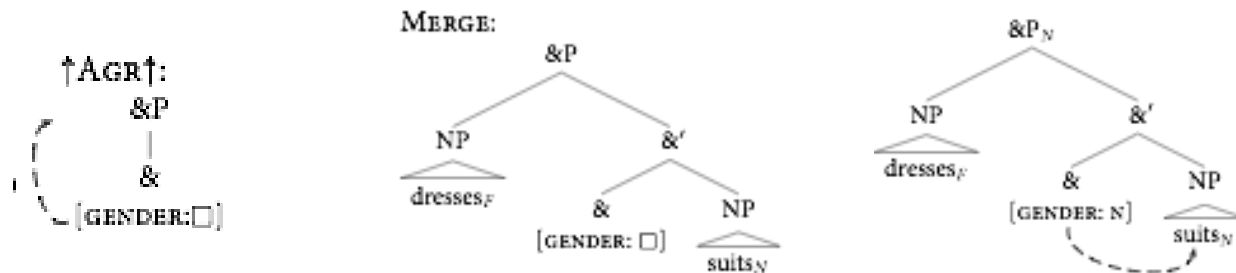
This time, only &P can move; yielding preverbal CCA

- **Disadvantage: predicts preverbal HCA to be impossible, counter to fact**

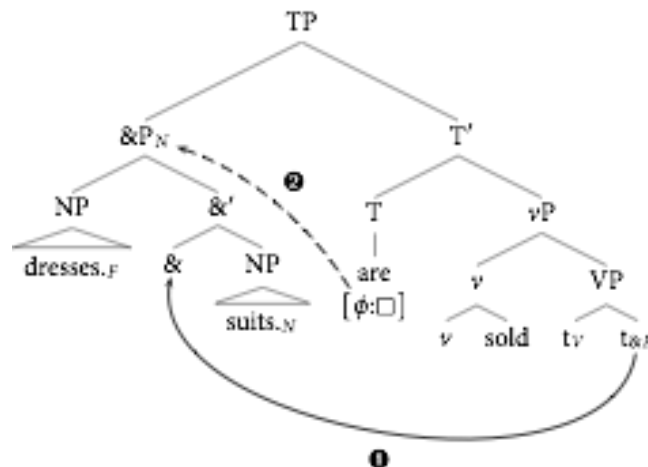
# Theories of conjunct agreement: Puškar & Murphy 2015

## DERIVING PREVERBAL CCA SYNTACTICALLY

(MOVE) > ↑AGR↑ > MERGE > ↓AGR↓



*Uniform order of operations within a derivation:*



Move feeds  
upward Agree;  
T agrees with  $\&P$   
(and hence NP2)

# EVALUATING Puškar & Murphy 2015

- Correctly Rules in Preverbal HCA & Rules out Postverbal DCA
- Even rules out impossibility of Medial Conjunct Agreement in 3-conjunct coordinations
- Disadvantage:
  - as all the action is internal to &P, faces difficulty when different agreement targets pick different parts of the conjunction...
  - default is predicted to exist with Post verbal subjects

# Experimental design: sandwiching



# Experimental design: sandwiching

PARTICIP1 [C1 & C2] PARTICIP2

***Split Agreement:*** Participle 1 agrees with C1 and Participle 2 agrees with C2

***Double HCA:*** Both participles agree with C1

***Double LCA:*** Both participles agree with C2

Three different experiments

# Experimental design: sandwiching

Exp3a: Double CCA vs Double HCA vs Double LCA vs PostV

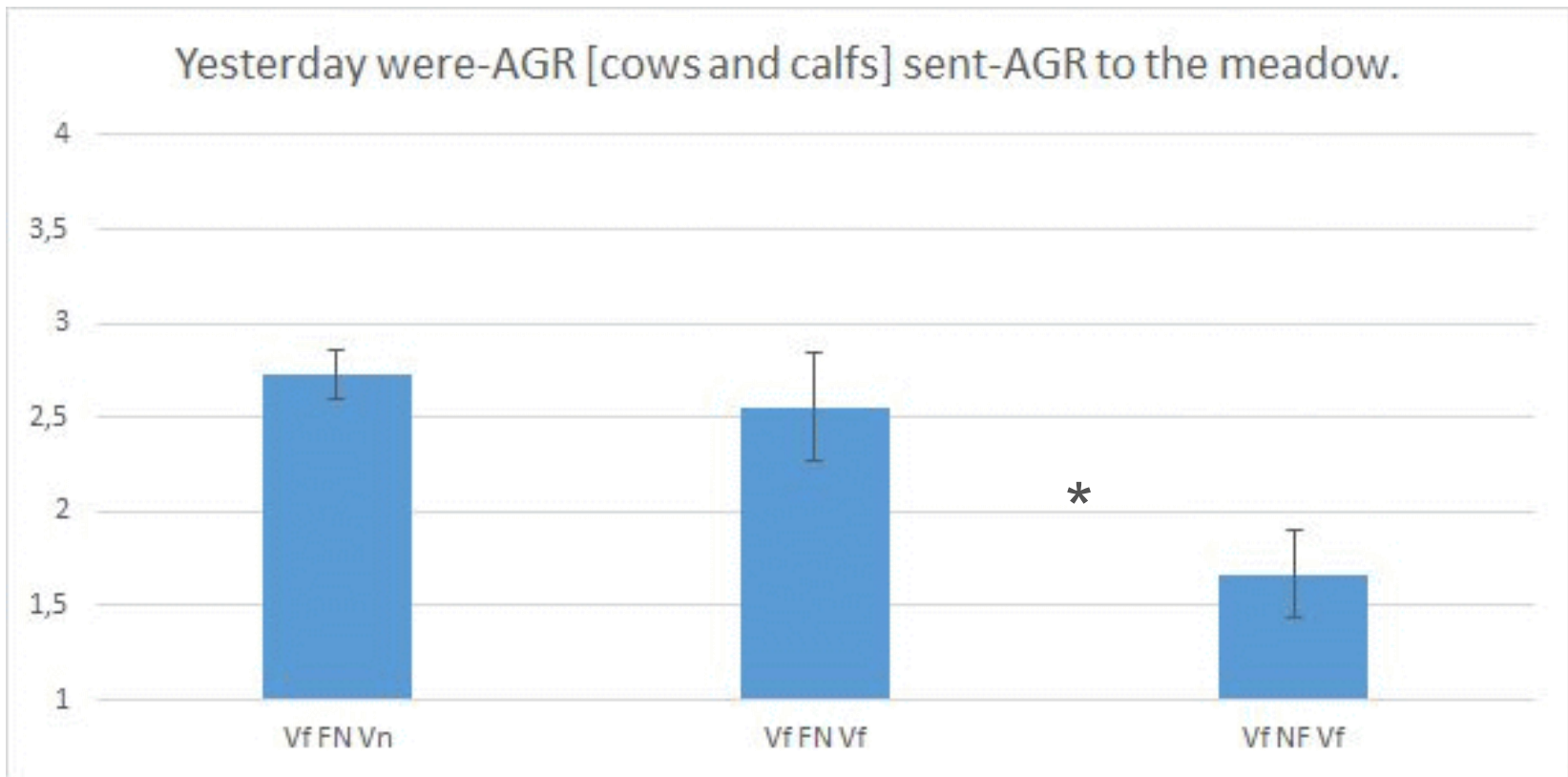
Exp3b: Double CCA vs Double HCA vs Double LCA vs Double DEF vs PostV HCA/DEF

Exp3c: Double CCA vs Double HCA vs Double LCA vs Double DEF vs HCA+DEF vs PostV HCA/DEF

Grammaticality judgment tasks with 30 to 40 test items and an equal number of fillers

30 to 40 subjects were tested in each experiment

# Exp3a RESULTS: Double CCA is OK, and so is Double HCA



Double CCA

Double HCA

Double LCA



# Sandwiched Agreement

a) **double CCA** (also HCA + CCA): **Vf FN Vn**

V hribih so bile [gobe in zelišča] zaščitena  
In hills aux were.F fungi.F and herbs.N protected.N

b) **double HCA** (also CCA + HCA): **Vf FN Vf**

V hribih so bile [gobe in zelišča] zaščitene.  
In hills aux were.F fungi.F and herbs.N protected.N

c) ?? **double default**: **Vm FN Vm**

V hribih so bili [gobe in zelišča] zaščiteni.

# SANDWICHED AGREEMENT

d) **Double LCA**: furthest + CCA: **Vn FN Vn**

e) CCA + default (also CCA + default): **Vf FN Vm**

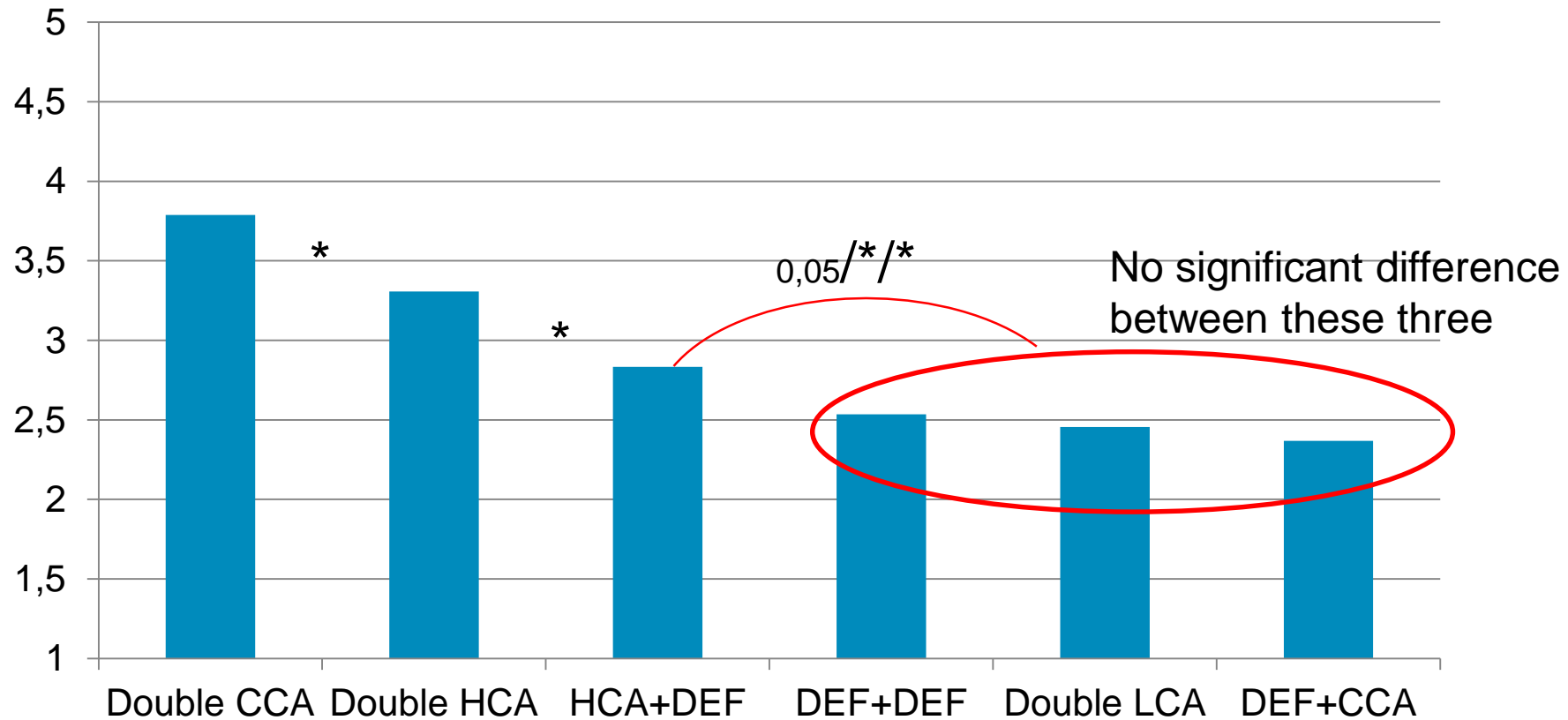
i) default + CCA: **Vm FN Vn**

# Availability of double default

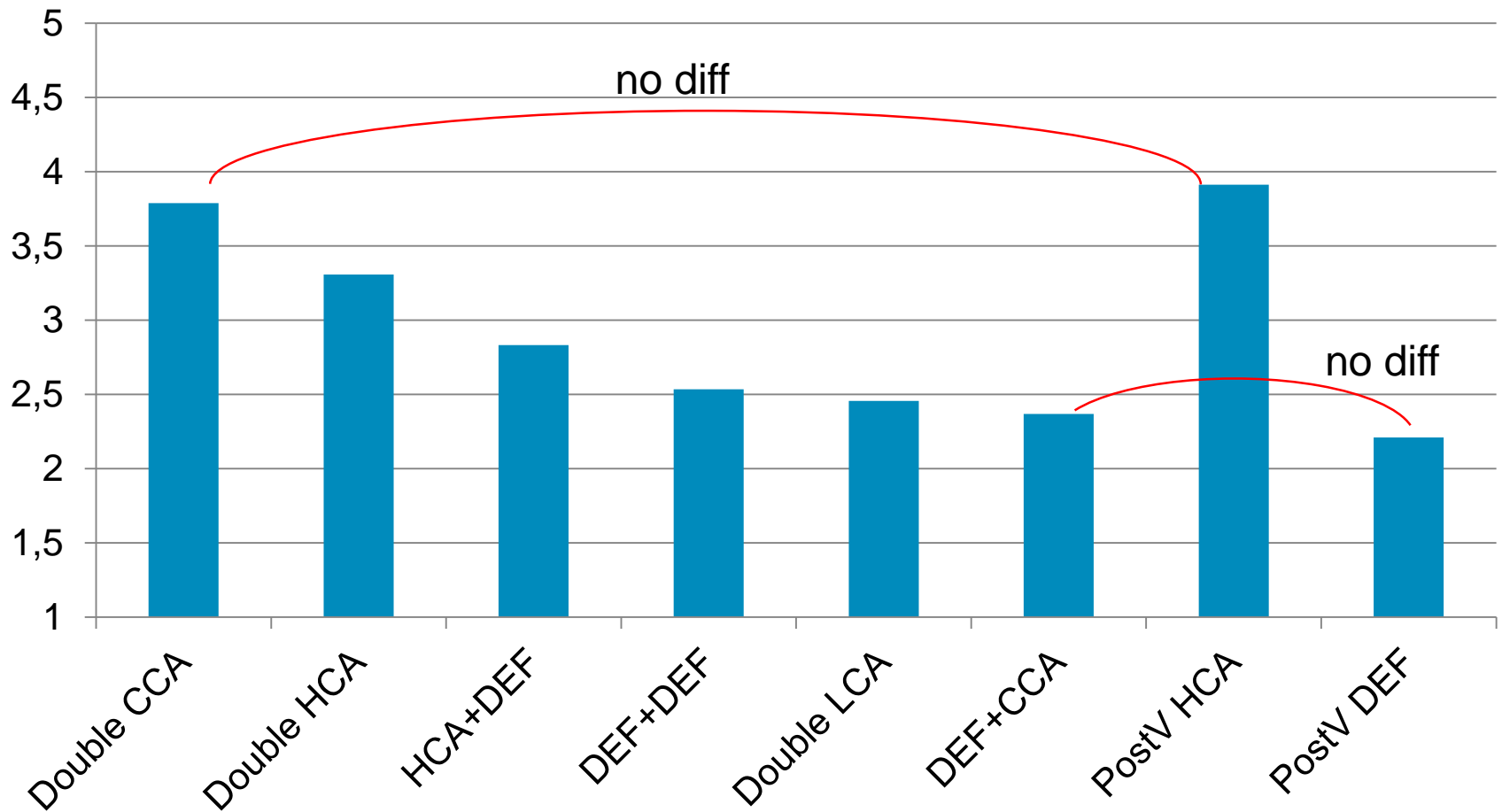
- Default in VS is not as frequent and is not judged as good as default in SV
- Exp1:
  - FN --- 18% of MPL in SV vs. 1% in VS
  - NF --- 27% of MPL in SV vs. 1% in VS
- Exp2:
  - FN with  $M = 2.98$  in SV vs. 2.04 in VS
  - NF with  $M = 2.48$  in SV vs. 2.00 in VS

MPL agreement with FN/NF is index agreement on &P  
Smith (2014): index agreement requires that the controller surface c-command the target

# SANDWICHED AGREEMENT



# COMPARISON WITH PostV



# SANDWICHED AGREEMENT

Vf FN Vn	HCA+LCA	3,789
Vf FN Vf	Double HCA	3,307
Vf FN Vm	HCA+DEF	2,833
Vm FN Vm	DEF+DEF	2,535
Vn FN Vn	Double LCA	2,456
Vm FN Vn	DEF+LCA	2,368
Vm FN Vf	DEF+HCA	Not tested
Vn FN Vm	LCA+DEF	Not tested
Vn FN Vf	LCA+HCA	Not tested

# SANDWICHED AGREEMENT

- Agreement on the 1<sup>st</sup> participle mirrors the options available with **postverbal** subjects
- Agreement on the 2<sup>nd</sup> participle mirrors the options available with **preverbal** subjects
- The two agreement processes seem to be somewhat independent
- Would this be like that also in production?

# SANDWICHED AGREEMENT

- Bošković – Preverbal HCA is predicted not to exist → Double HCA is impossible to derive
- equally impossible is the double CCA pattern: CCA is made possible by the deletion of the gender features on the first conjunct.
- but if the first conjunct has no gender features it cannot agree with the higher participle.



# SANDWICHED AGREEMENT

- Double CCA could also be derived via clausal ellipsis.

–  $[V_{FPL} NP_{FPL}]$  &  $[NP_{NPL} V_{NPL}]$

- But not Double HCA.

–  $* [NP_{NPL} V_{FPL}]$

- Or HCA + DEF

–  $* [V_{MPL} NP_{NPL} V_{MPL}]$

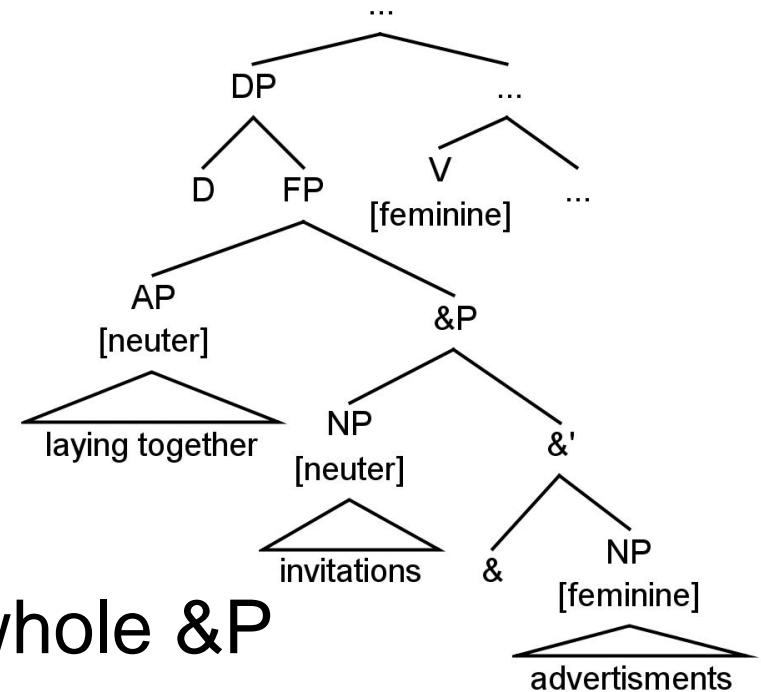
# SANDWICHED AGREEMENT

- In order for the lower Participle to get CCA, ConjP needs to be linearized.
- Only CCA is available after ConjP has been linearized
- Only CCA/HCA is available with PostVerbal subjects

**THANK YOU**

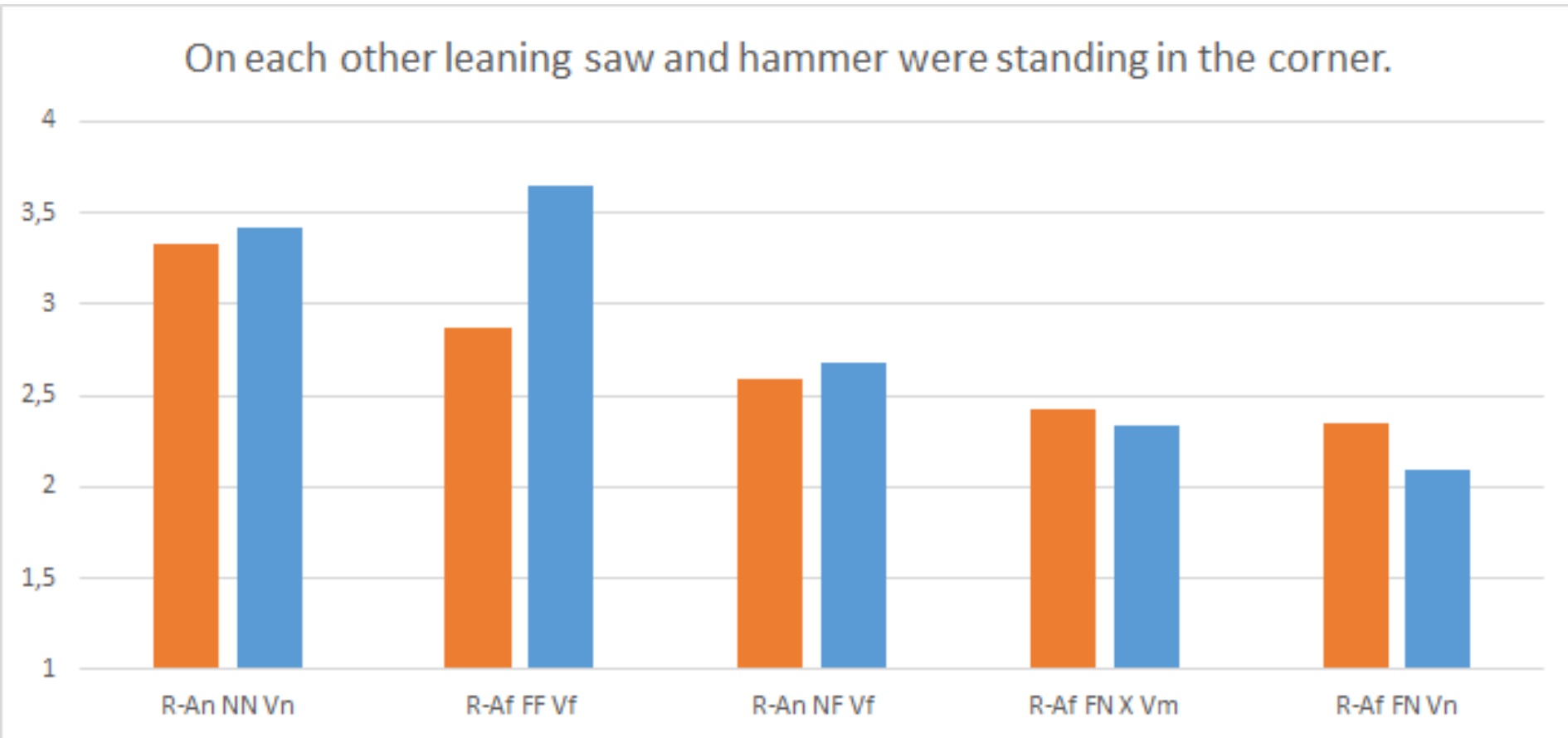
# Collective ADJECTIVES: INSIDE DP & OUTSIDE &P

- Collective adjectives:
- Scope over the entire &P
- Show number agr. with the whole &P (Dual or Plural, depending)
- But gender agreement on these Adj is independent of the CCA on the following verb.



# Collective ADJECTIVES: PILOT RESULTS

On each other leaning saw and hammer were standing in the corner.



Split agreement

# COMPARISON WITH ATTRACTION CONFIGURATIONS

## Participant sees model sentence

Reklama je emitovana na radiju.  
advert.F.SG. AUX.SG broadcasted.F.SG. on the.radio

## Participant sees replacement noun phrase (&P) displayed onscreen

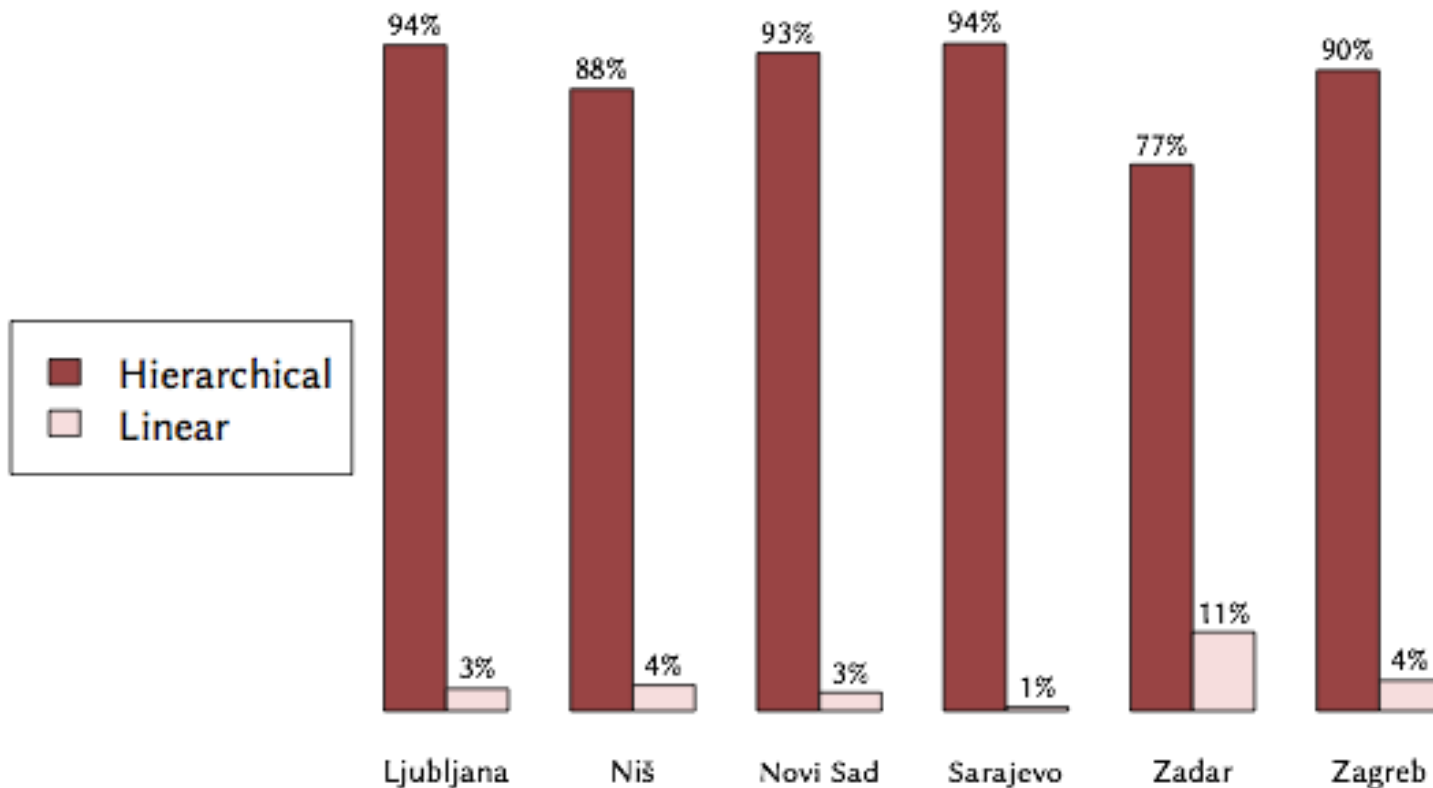
Pitanje koje su postavili slušaoci  
question.NOM.N.SG. that had asked.M.PL listeners.NOM.M.PL.

## Participant produces new sentence aloud and then clicks mouse

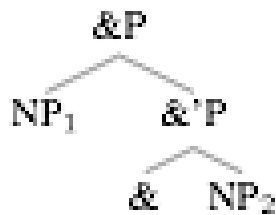
Pitanje koje su postavili slušaoci je/su emitovan-o/-i  
question.NOM.N.SG. that had asked.M.PL listeners.NOM.M.PL.

*Responses recorded, classified, tabulated*

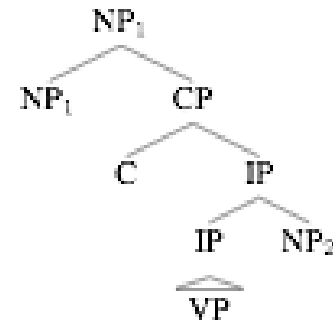
# HIERARCHY IS THE NORM (Attraction RCs)



# COMPARING THE TWO STRUCTURES



The higher NP is not the head of the whole phrase; no reason for agreement to respect hierarchy



The higher NP *is* the head of the whole phrase; agreement is forced to respect hierarchy

*Wait, so how do we know &Ps have any structure at all?*



# More ADJECTIVAL combinations

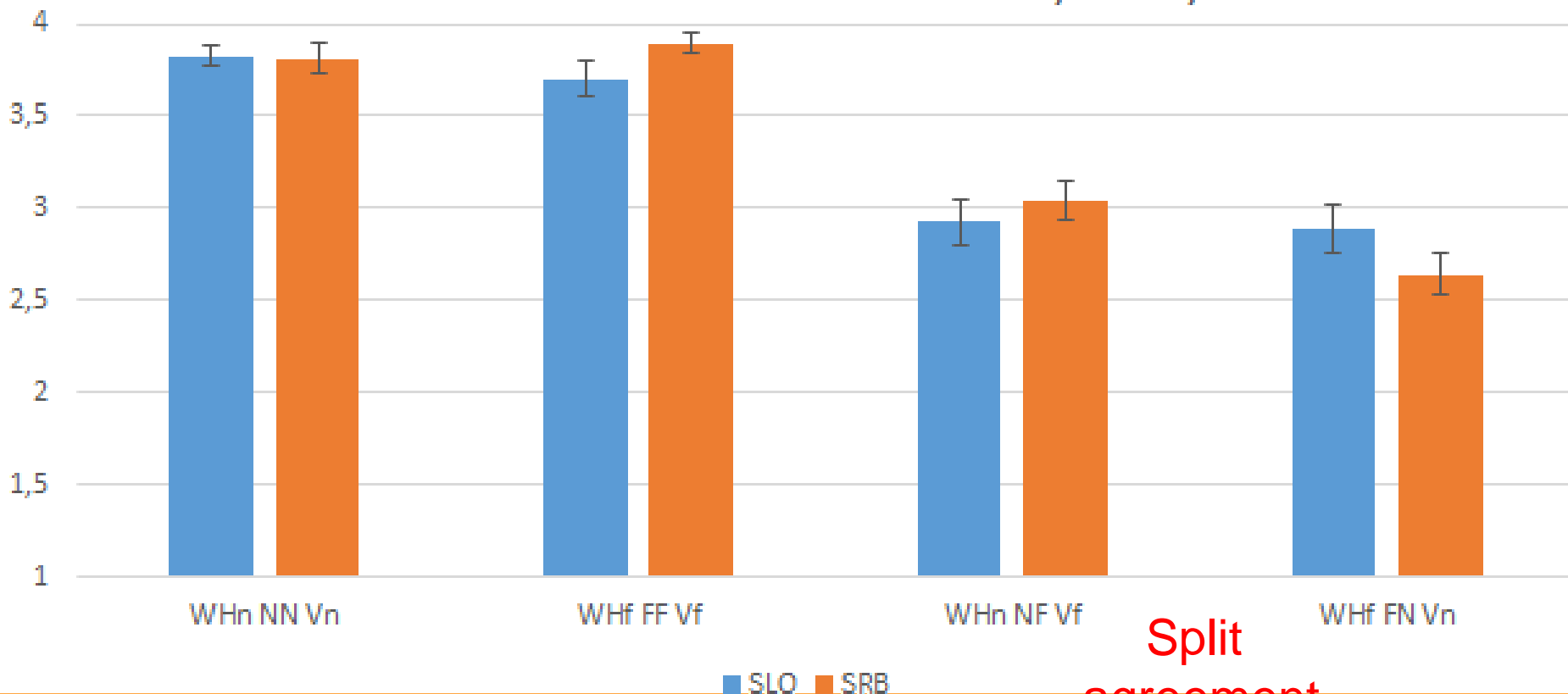
- Wh word scoping over both conjuncts as in
  - *Which pen and pencil did you buy?*
- Wh-word shows agreement in gender, number and case (just like adjectives)
- [Katera [mesta in vasi]] so tekmovale?  
which<sub>N.PL</sub> towns<sub>N.PL</sub> and villages<sub>F.PL</sub> aux<sub>PL</sub> compete<sub>F.PL</sub>

# More ADJECTIVAL combinations

Koje diskusije i predavanja su održana u utorak?

Which discussions and lectures were held on Tuesday

Which table and chair did you buy?



Split  
agreement

■ SLO ■ SRB