

Problems of Projection in Language Change

Elly van Gelderen

Arizona State University

DiGS 18, Gent, 30 June 2016

Outline

- Problems of Projection and PoP Extensions (Chomsky 2013; 2015) argue that labelling is done at the interfaces.
- XP, YP merge is frequent and a problem.
- Ways to get out of labeling paradoxes: move, share features, and roots, and I argue: Phrase to Head (aka Spec to Head).
- Nine cases studies of Spec to Head
- Larger questions, e.g. Feature sharing vs search and the nature of expletives

X'-theory

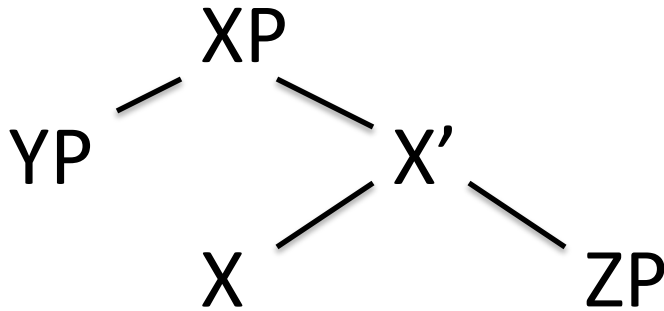
Labelling a phrase as VP or DP was a core component of phrase structure in the generative framework.

Phrases were headed and expanded to a maximal projection with a specifier, head, and complement.

The X'-schema is seen by many as perhaps one of the greatest generative insights into syntactic structure.

Movement was by heads to head positions and by phrases to specifier positions.

XP: lexical and functional



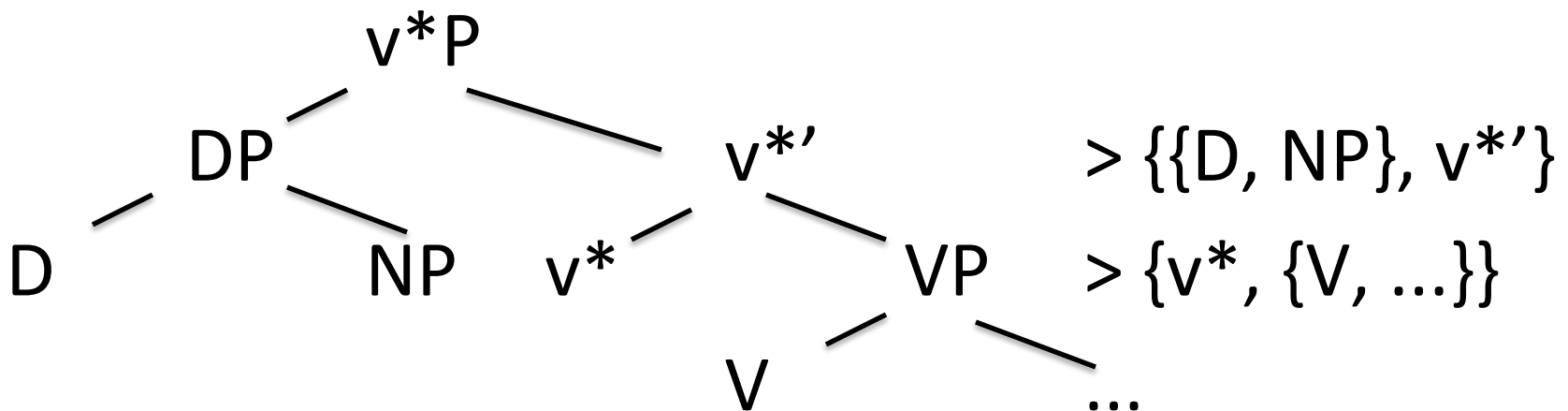
X'-theory was part of UG and is now replaced by Merge without labeling.

Towards simpler computations

The spirit of the current Minimalist Program from Chomsky (1995) through Problems of Projection (PoPE) in Chomsky (2015), however, is to attribute as little as possible to the computation, restricting it to simple merge with a labeling algorithm as the derivation is transferred to the interfaces.

PoP and labelling

All Syntax does: it takes objects and yields unordered sets $\{X, Y\}$ without a label (Chomsky 2013: 42)



Labeling the set is not part of Merge and should be left to a requirement of the interface.

Slightly different definitions:

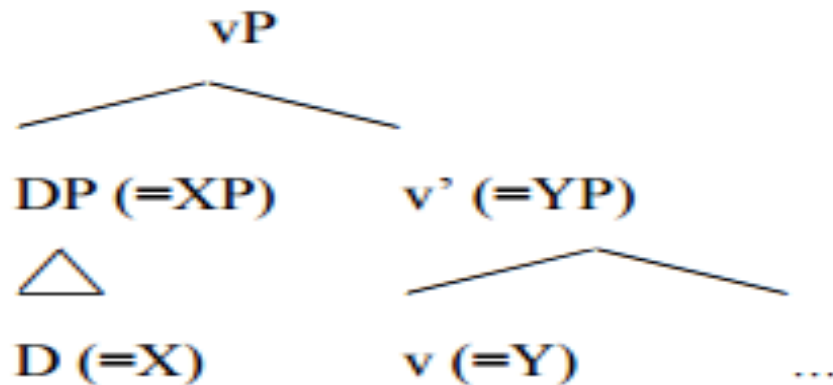
- a. The Labeling Algorithm is “a special case of minimal search” seeking “heads H within its search domain ... it must take place at the phase level, as part of the Transfer operation” (Chomsky 2015: 6).
- b. Labeling Algorithm: The category created by Merge receives the label of the closest head.
Labelling must be complete at the interfaces. (Rizzi 2014: 12)

$\{X, YP\}$, $\{XP, YP\}$, and $\{X, Y\}$

- $\{X, YP\}$ is unproblematic: take X
- $\{XP, YP\}$ is problematic: no obvious label

Several cases, e.g. first merge in Spec vP/PredP

(1)



and

(2) copula $\{XP YP\}$

Solution 1: move

Solution à la Moro: **move** one of the maximal projections. Chomsky: "modify SO so that there is only one visible head". (2013: 43)

But: movement creates new {XP, YP}:

(3) $\alpha[\text{Tom } T' [\text{~~Tom~~ } v^* \text{ read a book}]]$
(adapted from Chomsky 2015: 10)

where α cannot be labeled.

Solution 2: Share features and use these as label

Chomsky (2013: 43): “X and Y are identical in a relevant respect, providing the same label, which can be taken as the label of the SO”.

What are they? ϕ , Q

What counts as the label?

“LA simply determines a **property** of X for externalization and CI” (Chomsky 2015: 6)

“LA **selects H**” (Chomsky 2015: 7)

In the case of {XP, YP}, “the label is the **pair of agreeing elements**” (Chomsky 2015: 7)

Good about this approach is that:

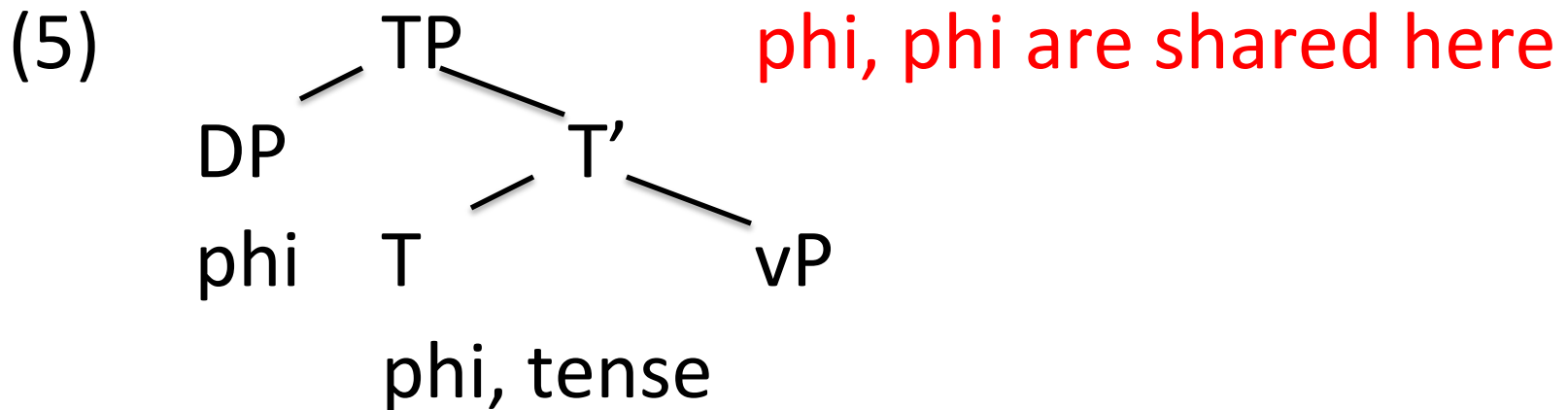
“IM is driven by labeling failures” (Chomsky 2015: 7)

The 'subject' position in detail

(4) α [Tom T [~~Tom~~ v* read a book]]

Note that Chomsky doesn't allow *Tom* to be a head in subject position or else we'd have no 'trouble' with the label: it would be D.

Hence the features. Take a look at (5).



Other applications of feature sharing
are “the interrogative feature Q, a feature of C and
the head of α ” in (6). (Chomsky 2013: 45; 2015: 8)

(6) a. They wondered [α in which Texas city [C [JFK
was assassinated]]]

b. *In which city did they wonder JFK was
assassinated.

This is the freezing/halting effect: moving further, as
in (6b), you’d lose the labeling.

and *that*-trace

If *who* moves out of α in (7a), α cannot be labeled because $\{t, T\}$ do not share $\langle \phi, \phi \rangle$, unlike $\{who, T\}$. If the phase-head *C* deletes in (7b), it transfers phase-hood to *T* and *who* remains in α until the next phase.

(7) a. * [γ Who do you v^* [ϵ think [δ C that [α t T read the book]]]]

b. [γ Who do you v^* [ϵ think [δ C [α t T read the book]]]]

Note that α in (7a) could be labelled TP; see Takita et al (2016) for a suggestion re trace/copy.

A third solution to the Labeling Paradox

Chomsky (2013: 47) says that this applies when one of the heads is a root (*veat*) and the other a functional element determining its category. If roots don't count as labels, no problem arises.

Chomsky (2015: 12) mentions another case of head-movement, namely to T and here “T [is] affixed to V. More generally, the conventional theory of head-raising seems to have the story backwards: the host should be affixed to the raised element” so these are not cases of {X, Y} because “the affix is invisible to the labeling algorithm”.

What's good about PoP?

Principled reason behind movement

Solution to the Freezing problem

Provides the reason why uninterpretable features are in certain places of the structure:
TP/CP and v^*P /VP.

Challenges:

More precision about features, properties, ...

Reassembly of the structure after transfer

Now to language change

Spec/phrase to head is frequent:

Full (subject) pronoun to agreement on T
and (object) pronoun to agreement on v*

Demonstrative pronoun to article

Demonstrative pronoun to complementizer

Demonstrative to copula

Wh-phrase to *Yes/No* head in C

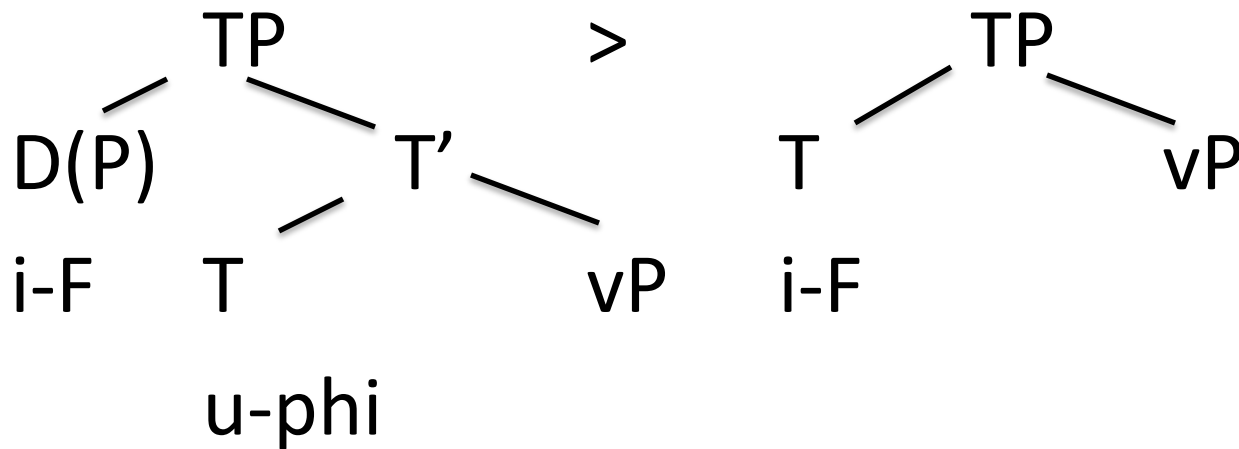
PP in Spec CP > C

Negative adverb to negation marker

Adverb to aspect marker

Spec to Head is labeling solution 4

The Spec could also be reanalyzed as Head:



(van Gelderen 2004; 2011).

So from feature-sharing in {XP, YP} to minimal search in {X, YP}

Chomsky 2016

IM of the subject to Spec TP and then IM of C:

(a) C {DP, TP}
 [u-phi] [i-3S]

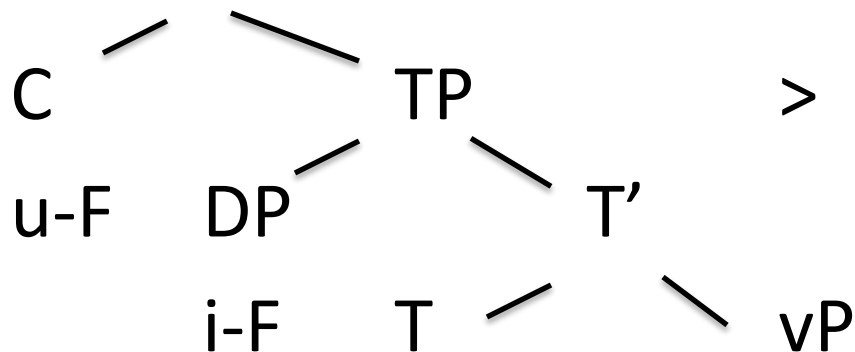
C values its features:

(b) C {DP, TP}
 [u-phi: 3S] [i-3S]

C transfers features to T and <phi, phi> labeling of {DP, TP} occurs:

(c) C {DP, TP}
 [u-phi: 3S] [i-3S] [u-phi: 3S]

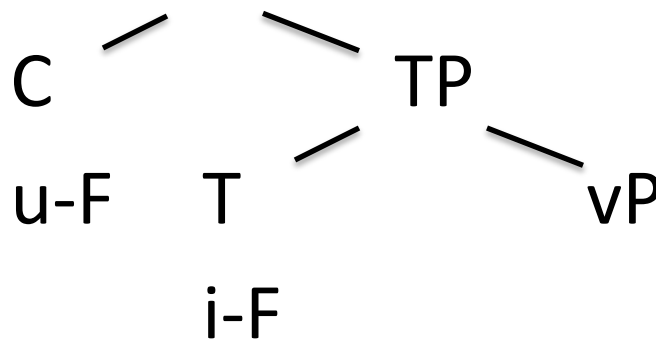
Spec-to-head under this new scenario



valuation of u-F on C

and transfer to T >

labeling due to feature
transfer



just valuation

labeling is search

Case 1: Full pronoun to agreement in T, from Old to Modern French

(1) *Si con **tu** meismes le preuves*

If when you self it prove

‘If you prove it yourself.’ (

<http://romandelarose.org>, Selden Supra 57, 40v)

(2) *Renars respond: “**Jou, je** n’irai”*

‘R answers “I, I won’t go”.’

(Coronnement Renart, A. Foulet (ed.) 1929: 598,
from Roberts 1993: 112)

- (3) **Je heureusement ai vu ça*
I probably have seen that
'I've probably seen that.'
- (4) *Moi, je + V*
- (5) ***Eux, ils** sont de gauche.*
them 3PM are of left
'They are left-wing'. (Cd'ES)
- (6) ***Les tomates, i** sont encore vertes*
'The tomatoes, they are still green.'
(Lambrecht 1981 : 40)
- (7) ***Tout chacun il** avait son carnet*
all everyone 3SM had his carnet
'Everyone had his carnet.' (Cd'ES)

Just a few more examples

The Basque verbal prefixes *n-*, *g-*, *z-* are identical to the pronouns *ni* 'I', *gu* 'we', and *zu* 'you.' (Gavel & Henri-Lacombe 1929-37),

As early as the 19th century, Proto Indo-European verbal endings *-mi*, *si*, *-ti* are considered to arise from pronouns (e.g. Bopp 1816).

Hale (1973: 340): in Pama-Nyungan inflectional markers are derived from independent pronouns: “the source of pronominal clitics in Walbiri is in fact independent pronouns”.

Mithun (1991): Iroquoian agreement markers derive from Proto-Iroquoian pronouns

Haugen (2004: 319): Nahuatl agreement markers derive from pronouns.

The stages

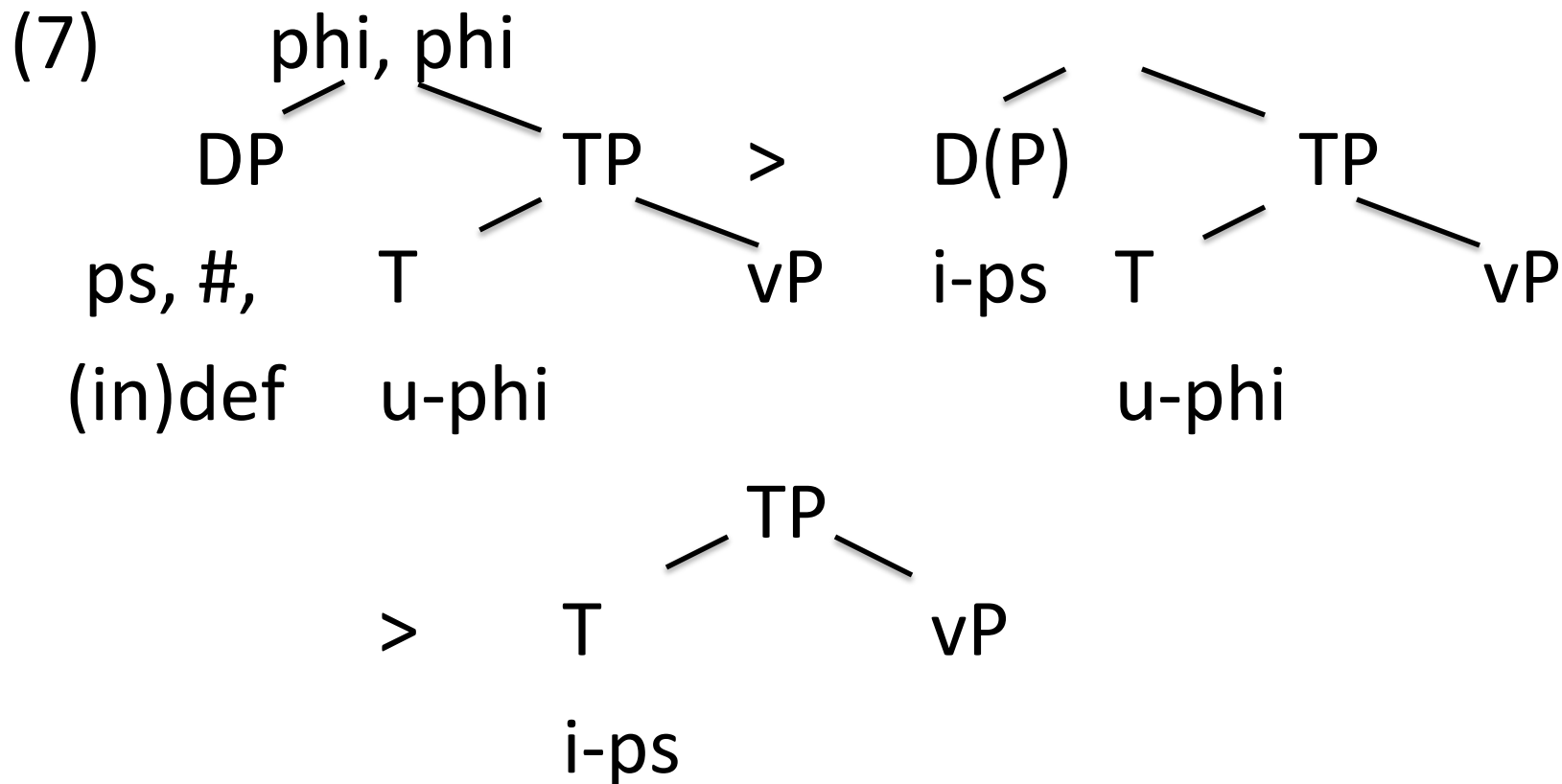
Pronoun: They (often) eat lasagna.

Clitic/ambiguous: They'eat lasagna.

Emphatic and agreement: Them th'eat lasagna.

Pronoun: Them (often) eat lasagna.

Sharing versus {X, YP}



The change in terms of features

emphatic/

demonstrative >

[i-phi]

[i-deixis]

ille

personal > agreement

[i-phi]

[u-phi]

[u-Case]

il

il +V

Scandinavian, Dutch etc: T is skipped

(8) *hariuha* ***haitika*** *farawisa* Old Norse

Hariuha named.1S danger.knowing
'I am called Hariuha, the one who knows danger.'
(*Sjælland bracteate* 2, Krause 1971).

(9) *da kank nie doen* Dutch variety
that can.1S not do 'I can't do that.'

(10) *Sestow this people?* Middle English
'See you these people?'
(*Piers Plowman* 468)

(12) *ni* *wane theih* *thir gelbo* Old High German
NEG think that.1S you deceive
'Don't think that I deceive you.'
(*Otfrid* I 23, 64, Somers Wicka 2007)

(13) *hätt-er gseit* Alemannic
has-he said (Giacalone Ramat 1998: 117)

Case 2: Full pronoun to v*/R

N. Athabaskan > S

Complementary distribution:

(1) ***meganehtan*** Kaska

me-ga-ne-0-h-tan

3S-at-ASP-3S-CL-look

`He looks at her`.

(2) ***ayudeni*** *ganehtan* Kaska

girl at-ASP-3S-CL-look

He looks at the girl(s).

to Navajo object agreement

(3) '*atoo*' *yí-ní-dlaa'-ísh*

soup 3S-2S-eat-Q

`Did you eat the soup?'

(4) *yí-ní-dlaa'-ísh*

3S-2S-eat-Q,

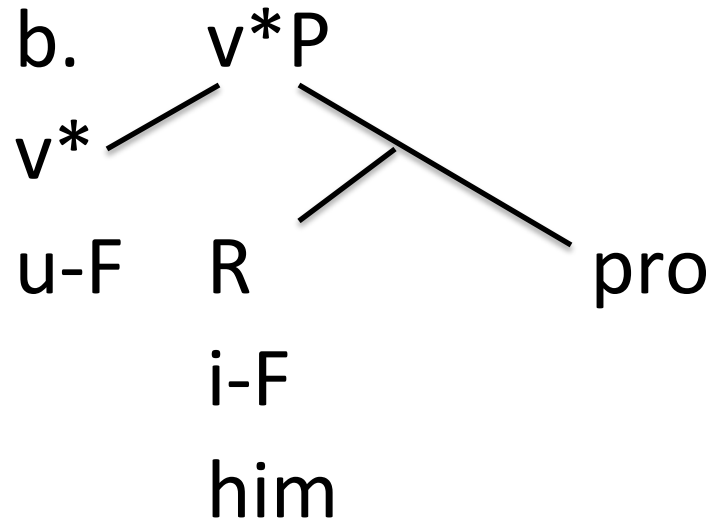
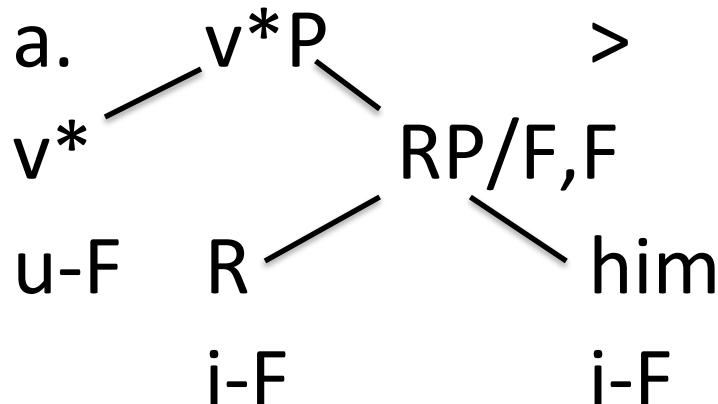
`Did you eat it?' (Jelinek 2001: 23)

Other object pronoun > agreement

- (1) *pursed-am-ash* Persian still CD
asked-1S-3S 'I asked him'
- (2) *fuft-ik ?inti* (some) Arabic
saw.1S-2S you 'I saw you.'
- (3) *Nga kihte-l sah* Kosraen
I feed-3S him
'I am feeding him' (Lee 1975: 61)

Reanalysis of objects is different

Unlike the subject, an object need not move because either R can label or v^* transfers features to R:



valuation and transfer to R just valuation

Case 3: Demonstrative to article

Old English-style in the Peterborough Chronicle.

(1) ***Brittene igland** is ehta hund mila lang. & twa hund
brad. & her sind on **þis iglande fif geþeode. Englisc. &
Brittisc. & Wilsc. & Scyttisc. & Pyhtisc. & Boc Leden.***

‘The island Britain is 800 miles long and 200 miles broad.
And there are in the island five nations; English, Welsh,
Scottish, Pictish, and Latin’.

1130

(2) ***Ðis** geares wæs **se** mynstre of cantwarabyri
halgod fram **þone** ærceb Willm **þes** dæies iiii No MAI*

‘This year was the monastery of Canterbury consecrated
by the Archbishop William, that fourth day before the
nones of May.’

To article

1137

(3) *Ðis gære for **þe** k Steph ofer sæ to normandi 7 ther wes underfangen forþi ð hi uuenden ð he sculde ben alsuic alse **the** eom wes.*

‘This year, (the) King Stephen crossed the sea to go to Normandy and was received there because they thought he was like the uncle .’

**se*

but ok in Old English:

(4) ***se** wæs Wine haten & **se** wæs in Gallia rice gehalgod.*

he was wine called and he was in Gaul consecrated
(from Bede)

The status of DP:

Is the DP a phase with a head D?

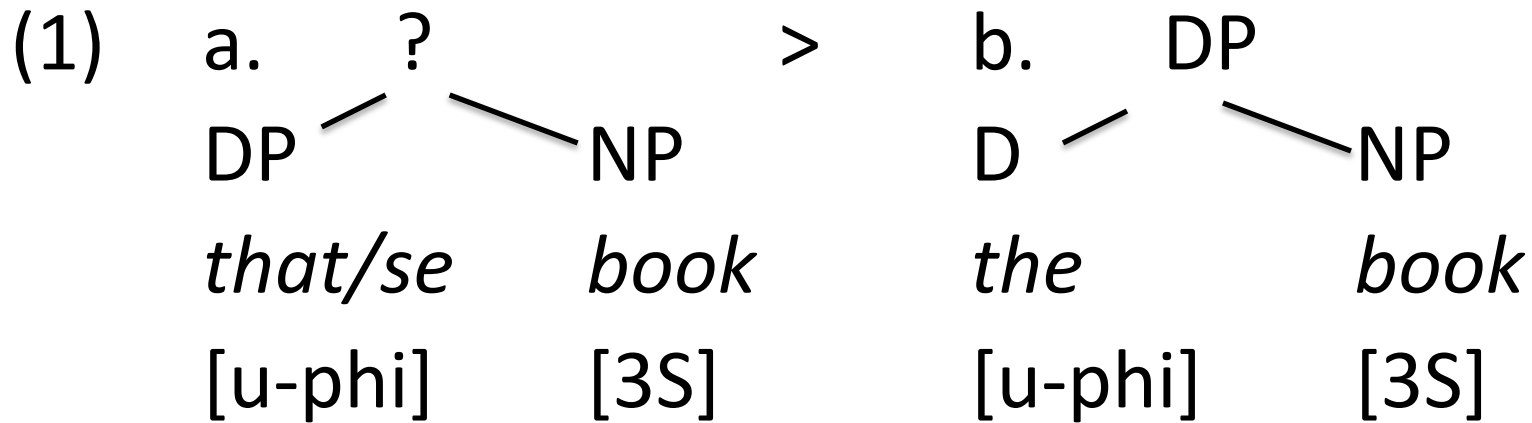
Chomsky has always been reluctant about the phasal status of the DP and currently sees D as an affix and the DP as headed by a noun.

What about demonstratives: concord as modifier?

Is Bošković right about the DP parameter?

Switch to D with u-phi?

Spec to head: some questions



Concord > Agreement

Labeling {DP, NP} can only | Regular search
happen if there is sharing.

Case 4: Demonstrative to C

(1) *Ic wat wytodlice ðæt ge secað ðone haeland **ðone**
ðe on rode ahangen waes.*

I know truly that you seek DEM-ACC savior DEM-ACC
REL on cross hung was

'I know that you seek the savior who was
crucified.' (*Matthew* 28.5, from Allen 1977: 87)

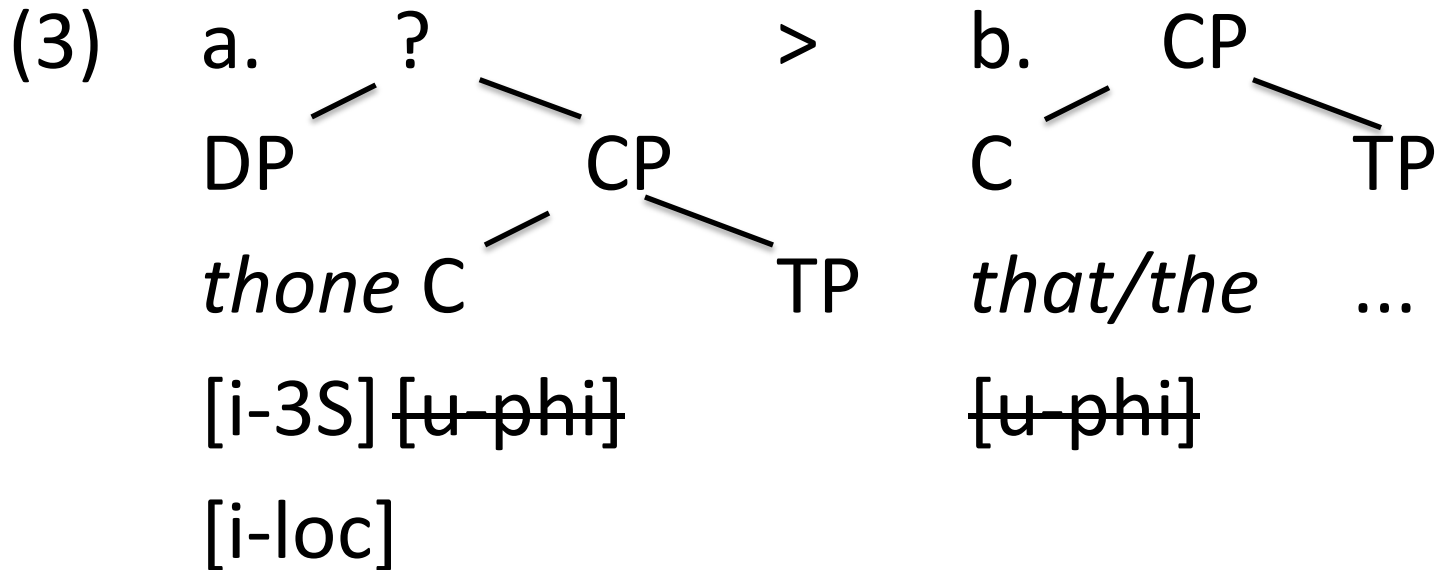
(2) *and suggeð feole þinges ... **þat** næuere nes i-wurðen*

and say many things REL never NEG.was happened

'and say many things that never happened.'

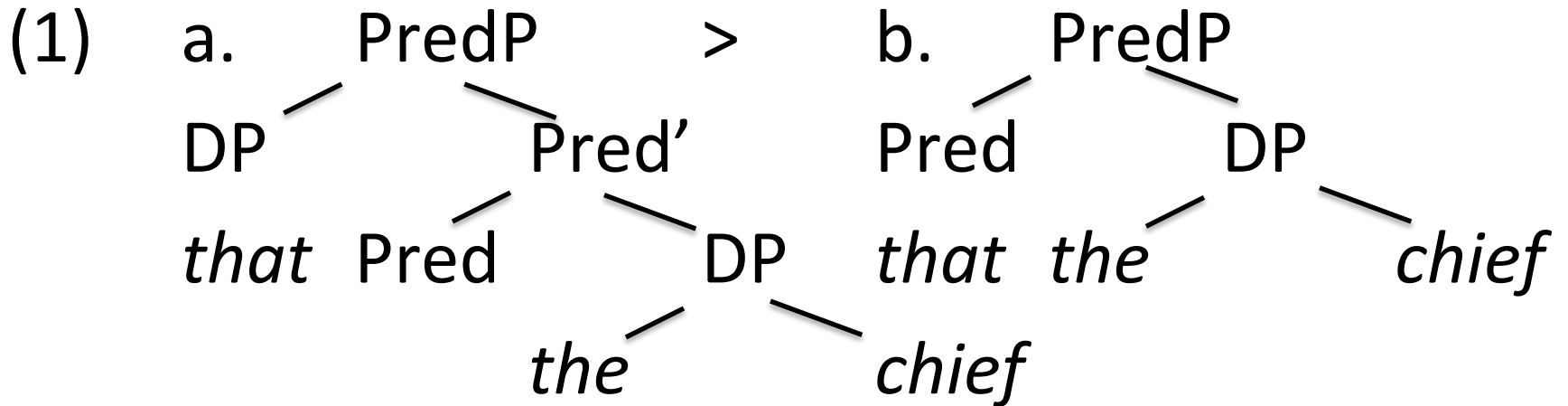
(Layamon, *Caligula* 11472-3, Brook & Leslie edition)

C's label: C or phi?



What is C sharing in (3a): REL as in Rizzi? The incentive for reanalysis to (3b) is obvious...

Case 5: Demonstrative to copula



Widely attested: Semitic, Egyptian, Creoles, Iranian, Slavic, Tibeto-Burman, Swahili, Indonesian, Zoque, Passamaquoddy, Maya, Chinese.

Old Egyptian (1) > Middle (2)

(1) *rmt* ***p-n*** *ntr-w* ***jp-w***
man MS-PROX god-P MP-PROX
'this man.' 'these gods.'

(2) *,tmj-t* ***pw*** *jmn-t*
city-F be west-F
'The West is a city.'

(Loprieno 1995: 68; 2001)

(3) *p* *-w* > *pw*
[i-3MS] [proximal] copula (pst/pr)

Structurally: Specifier to head

Classical to Standard Arabic (cf. Eid 1983)

Classical = pronoun

- (1) *allahu* ***huwa*** *'lhayyu*
 God 3MS the.living
 'God is the living.' (Benveniste 1966 [1971: 165])

Standard = copula

- (2) *Anta* ***huwa*** *D-Dakii*
 2MS COP the-smart
 'You are the smart one'
(Alsaeedi 31; newspaper 2012)

Hijazi Arabic (Alsaeedi 2015)

- (3) *ahmad ma hu(wa) ad-duktoor*
Ahmad NEG MS the-doctor
‘Ahmad is not the doctor.’ (Alsaeedi 39)

ma + huwa/hiya, etc = mu/mi

- (4) *ana mu ad-duktoor*
1S NEG-be the-doctor
‘I am not the doctor.’ (Alsaeedi 40)
- (5) *huda mi (ma hiya/mu) ad-duktoorah*
Huda NEG.be.F the-doctor-FS
‘Huda is not the (female) doctor.’ (Alsaeedi 41)

Egyptian Arabic

(Edwards 2006: 51-3)

(6) a. *`ana huwwa l-mas'u:l*
1S 3SM the-responsible

'I am the responsible.'

b. *il-mushkila hiyya T-Talaba*
the-problem(FS) 3SF the-students

'The problem is the students.'

(7) *faTma ma-hiyya:-sh il-mas'u:la*
Fatima NEG-be.3SF-NEG the-responsible

'Fatima is not the one responsible.'

Changes in Arabic

huwwa > *hu(wwa)*

i-3MS u-phi (gender/number)

i-pres

equative

Specifier to Head: Spec TP > T (but could be Spec
PredP > Pred)

Zoque (Mixe–Zoque)

Demonstrative and copula co-occur in:

- (1) *Te' tuwi kananbüde*
te' tuwi 0-kanan=pü=te
DET dog 3B-old=REL=PRED
'The dog is old' (Faarlund 2012: 141-2)
- (2) te xka'e che'bü te'
DET girl small she
'The girl, she is small.'

Labeling

{DP, AP}	EM
{Pred, {DP, AP}}	Merge of copula
(DP, {Pred, { DP , AP}})	IM of DP: unlabelable

Then T merge and IM again? Anti-locality rules this out? So reanalysis as head.

Case 6: *Wh*-phrase to *Yes/No* head (and C)

How, whether

Label is <Q, Q>:

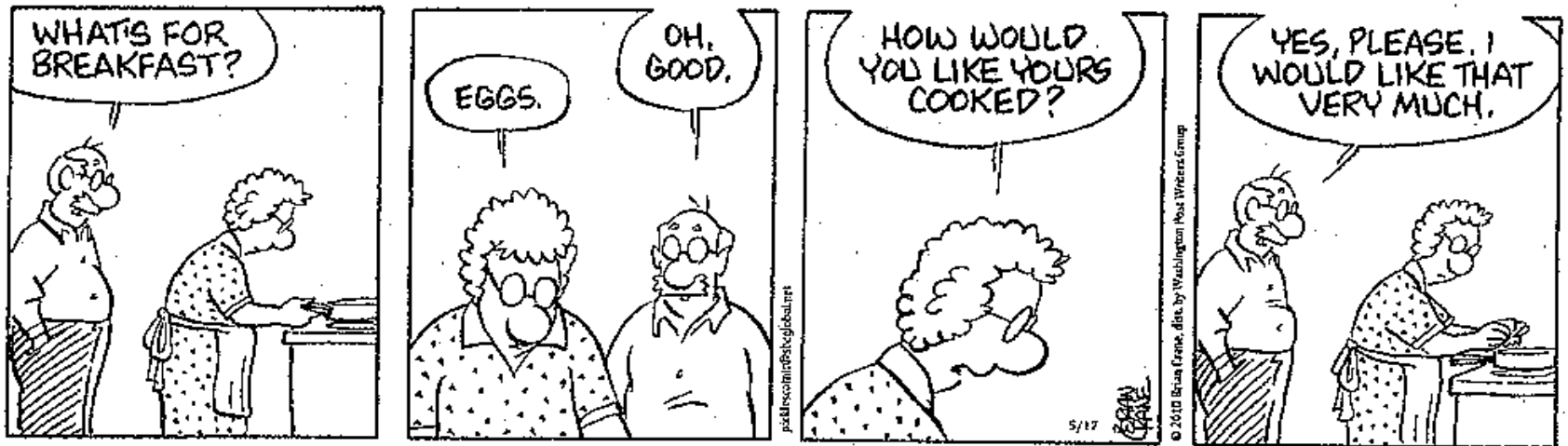
(1) I wonder [whether [C [he'll do it]]].

(2) the Congressmen who come in in January
and asking **whether if** one kind of affects the
other. (COCA Spoken 2010)

Doesn't change to head; same with *how*!

How, whether: remain Spec

PICKLES



Many featural changes:

How	C	[the skaters win how]?
[i-wh]	[u-Q:-wh]	
[manner]	did	

How	C	[you would how like to do this]?
[i-degree]	[u-Q:-degree]	
	would	

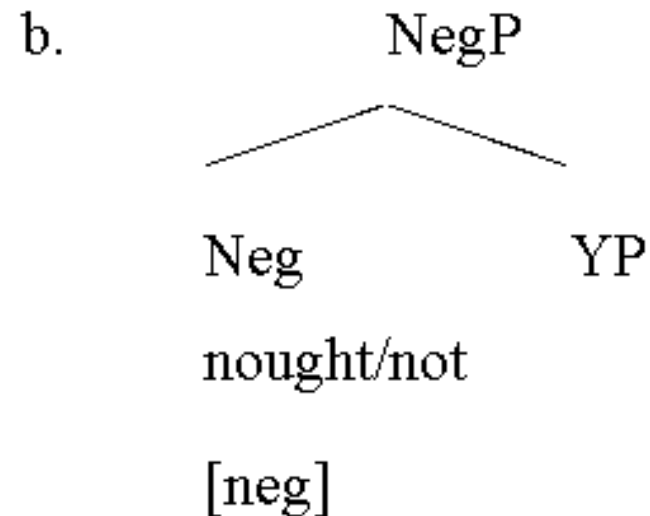
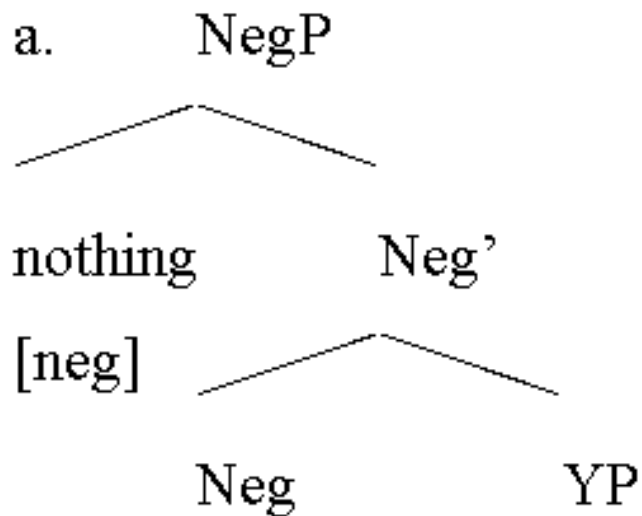
How	C	[you would like to go]?
[i-polar]	[u-Q:-y/n]	
	would	

Case 7: Negative adverb to head

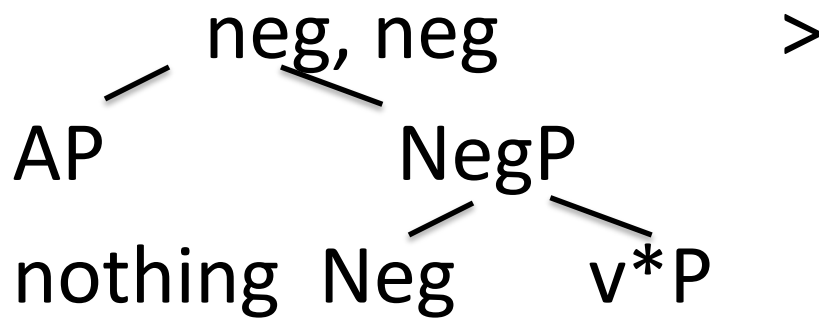
(1) earlyOE > OE/ME > earlyModE > ColloqEnglish

no/ne (ne) ... not -n't -n't ... nothing

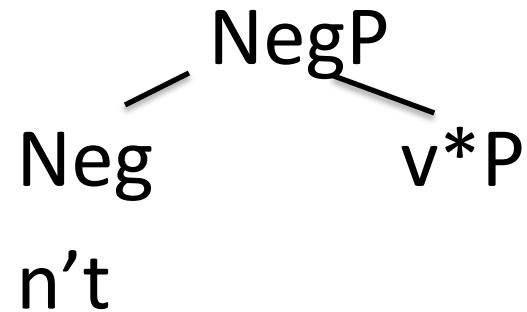
(2)



Labeling: search over sharing



labeling due to sharing



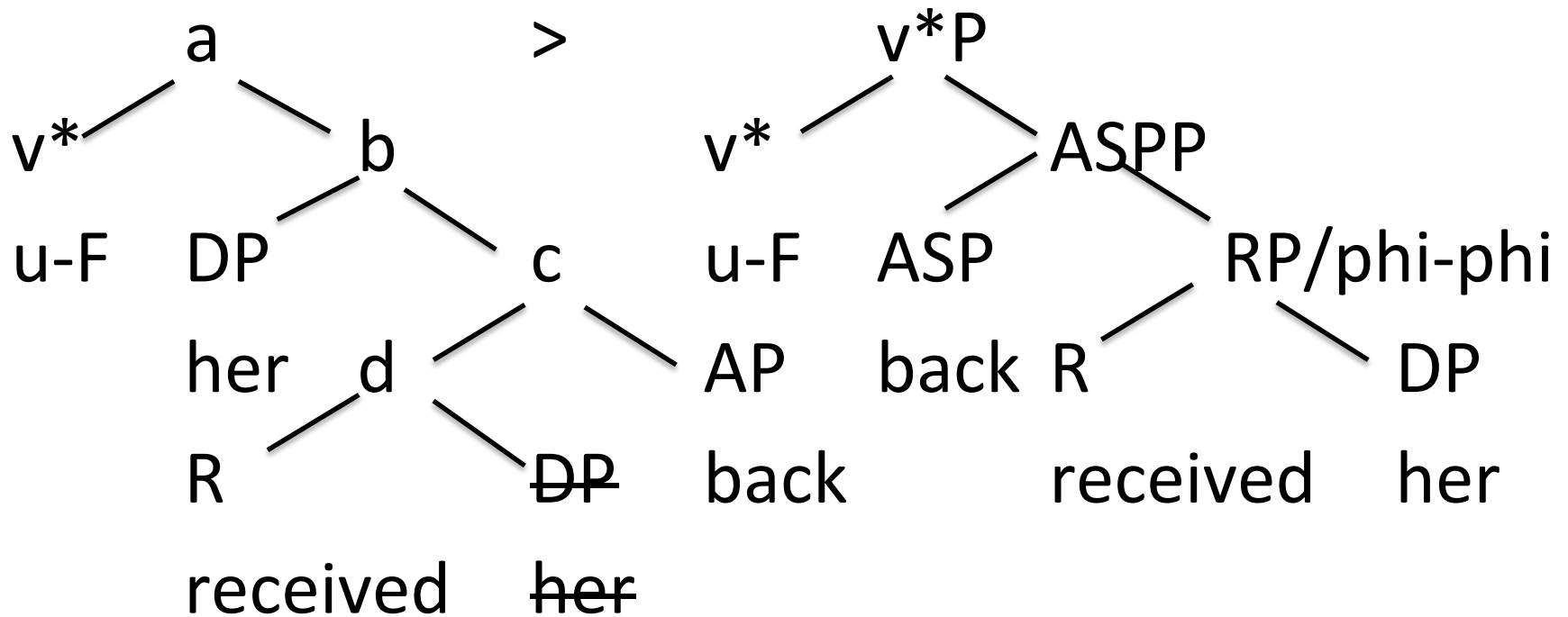
labeling is search

Case 8: Adverb Phrase to Aspect Head

- (1) They received the book right back >
- (2) They received (*right) back the book

This hasn't occurred a lot in English, the AP remains lexical/telic aspect, not grammatical perfective.

Labeling should 'want' the change



a = v*P; b = problematic fine labeling
because of c

Case 9: PP in Spec CP > C

- (1) Ercenberht rixode **æfter his fæder**
'E. ruled after/following his father.'
(Chron A, 640)
- (2) [**æfter him**] Stephanus feng to rice.
'after him Stephanus became pope'.
(*Chronicle A*, anno 814 [816])
- (3) [**æfter pissum gefeohte**] cuom micel
sumorlida.
'after this fight, there came a large
summer-force'
(*Chronicle A*, anno 871)

- (4) [**Æfter þysan**] com Thomas to Cantwarebyri
`After this, Thomas came to Canterbury'.
(*Chronicle A*, anno 1070)
- (5) [**æfter ðon**] uutedlice ic eftariso ic forlioro I
iowih in galileam
`after that, surely I arise-again I come
before you in Galilee'
(*Lindisfarne Gospel*, Matthew 26. 32).
- (6) **After that** the king hadde brent the volum
(Wyclif 1382 ,OED).
- (7) **Aftir** he hadde take þe hooli Goost (c1360
Wyclif *De Dot. Eccl.* 22).

Increase in PP-fronting and demonstrative objects

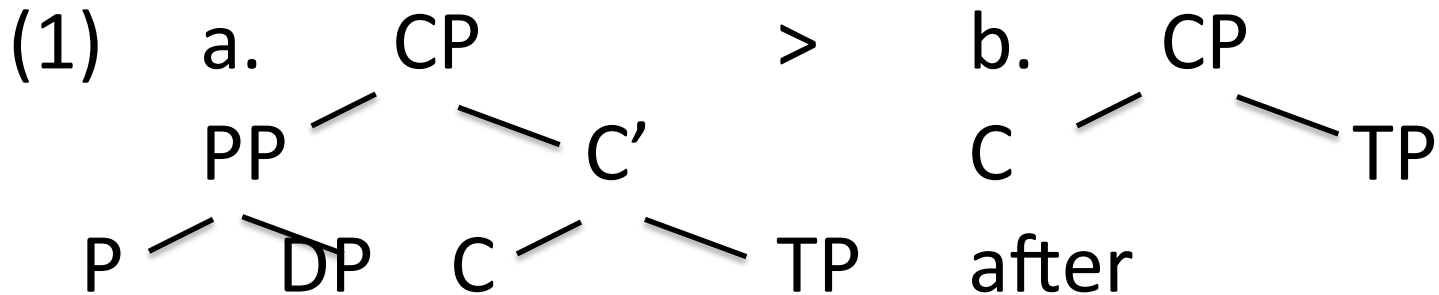
Parker Chronicle

	Before the year 892	After 893
Fronting	7/26 = 27%	12/22 = 55%
Dem	2/26 = 8%	17/22 = 77%

Changes

a.	PP	PP	900 (Chronicle A) - present
b.	PP (<i>that</i>)		950 (Lindisfarne)–1600 (OED 1587)
c.	P <i>that</i>		1220 (Lambeth)–1600 (OED 1611)
d.	C		1360 (Wycliff)–present

Structurally



Which features are shared: temporal features?
Same with *for*, cause, purpose.

And also with adverbs!

Recap of the nine cases: search over agree

Subject and object cycles: reanalysis of i-F and labeling as search

Demonstrative to D and to C: towards labeling as search

Demonstrative to Pred (or T): anti-locality

Wh- to head: no labeling need

Neg AP > Neg: reanalysis of i-F and labeling as search

AP > ASP: should be more frequent

PP > C: reanalysis of i-F and labeling as search

And the feature-sharing in turn provides evidence about the source of expletives:
not locatives but demonstratives:

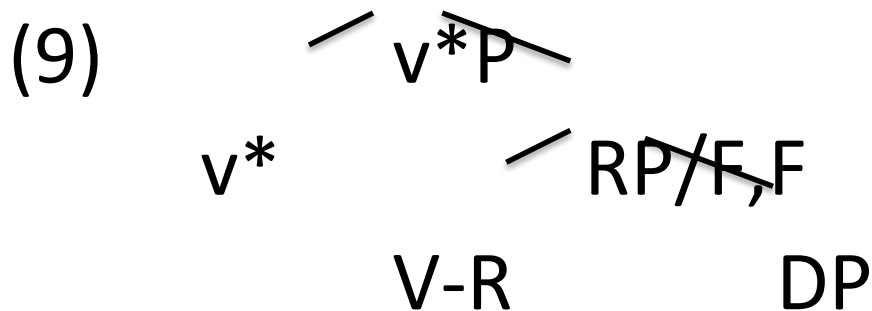
Jespersen (1937: 129): existential *there*
“originated as the” locative.

van Gelderen (1997: 91): source of expletive is
demonstrative via relative (which was either
singular or plural)

Synchronically, Kayne (2016): existential *there* is
base generated as deictic inside a DP.

Person: *there* with unaccusatives

Unaccusatives have a non phasal v^*P (in older work). One could say, no need to move DP in (9):



Expletive ‘solves’ weak T problem (since v^* can’t resolve it): only person is relevant

The “contradictory agreement” (Chomsky 2015: 10) is due to the nature of the expletive:

(10) There were ... three buildings.

Conclusions

PoP constitutes a paradigm-shift: attribute as little as possible to UG, e.g. labels.

IM is forced by interface conditions of PoP.

Now what becomes important is: solutions to labeling paradoxes.

Spec to head is one such solution: reanalysis and search over agree.

Expletives give us insight into Solution 2: phi seems person.

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Thanks to:

Haroon AlSager

Mariana Bahtchevanova

Annette Hornung

Daniela Kostadinovska

William Kruger (also for notes on Chomsky 2016)

Sayantan Mukherjee

Some issues with the “amalgam $[R, v^*]$ ”

Roots are “unspecified as to category, and ... their category as nominal, verbal, etc., derives from a merger with a functional element n, v , etc” (2015: 8).

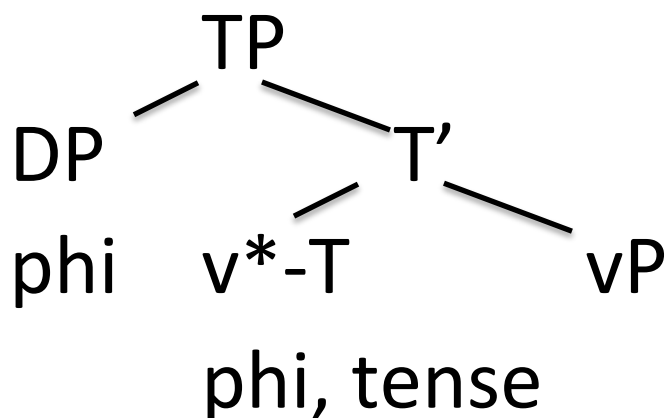
“Recall that R raises to v^* , forming an amalgam $[R, v^*]$ ” ... “with v^* adjoined to R and the affix invisible to the labeling algorithm. Note that although R cannot label, the amalgam $[R, v^*]$ can” (2015: 12).

But: also optional object raising! (2013; 2015: 7; 10; 13) and Chomsky is not clear about what labels: R (p. 10) or the object (p. 13).

How does affix T mesh with Subjects?

Chomsky (2015: 9) has an account of EPP (and ECP) that is based on weak T. In English (but not Italian), the T is too weak “to serve as a label” but, with an overt subject in what used to be Spec TP, the construction can be labelled <phi, phi>.

So: (8)



So is v* to T necessary as well?

The role of expletives in PoP

Expletives provide evidence as to which phi features are relevant for sharing: only person not number.

VSO languages such as Arabic present a challenge: S can stay in VP if person and gender are shared with v^* .

(1) *Darab-at l-banaatu Zaydan*

hit-FS the-girls Zayd

(2) *al-banaatu Darab-na Zayd-an*

the girls hit-FP Zayd

'The girls hit Zayd'.