

The Syntax of Features and its Consequences¹

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PART ONE: The formal syntax of Agree

1. Properties of Agreement

- (1) a. Haec puella Romana ambulat.
this-Nom.Fem.Sg girl-Nom.Fem.Sg Roman-Nom.Fem.Sg walks-3.Sg
- b. Hae puellae Romanae ambulat.
these-Nom.Fem.Pl girls-Nom.Fem.Pl Roman-Nom.Fem.Pl walk-3.Pl

Two dimensions along which features differ:

1. **valued/unvalued:** An unvalued feature F receives its value from a valued instance of F:

Examples:

- Gender on D and A is lexically unvalued, and comes from N:
argument: lexically specified for N, variable for D and A
- Number on D and A is lexically unvalued, and comes from N:
argument: sometimes lexically specified for N — pluralia tantum (Latin *moenia* 'town walls'; Eng. *scissors*)
- Number and person on V is lexically unvalued, and come from D or N:
argument: no number/person tantum verbs (at least in Latin, Spanish, Russian, English)
- ...but T on V is valued:
argument: There are tense tantum verbs: e.g. Latin *meminisse* 'remember' and *coepisse* 'began', which have only perfect-system forms. English *I have been to Tromsø* (= 'I have visited Tromsø' vs. **I must be to Tromsø/*I am to Tromsø* (Sabine Iatridou, p.c.).
- Pesetsky & Torrego (2001, 2004) [also Williams (1994, 11), Haerberli (2002)]:
Structural case is unvalued T on D/N.
arguments: ...to be reviewed shortly...

2. **interpretable/uninterpretable:** An uninterpretable instance of a feature F is in an agreement relation with an interpretable instance of F.

Examples:

- ϕ - (person/number) features are interpretable on N/D, but uninterpretable on V/Tns. The ϕ -features on V and T agree with counterparts on N and D.
- T-features are interpretable on Tns, but uninterpretable on V. [Hypothesis: there is an agree relation between Tns and V.]
- T-features/Structural case is interpretable on Tns, but uninterpretable on N/D.

¹ Joint work with Esther Torrego (University of Massachusetts/Boston)

Chomsky (2000, 2001) on the central role of Agree:

Agreement is a component of movement, and thus casts its shadow over much of syntax.

2. The "Minimalist Inquiries"/"Derivation by Phase" (MI/DbP) framework

How Agree works in MI/DP

- (2) **Agree [as value-assignment] (MI/DbP)**
- (i) An unvalued feature F (a *probe*) on a head H scans its c-command domain for another instance of F (a *goal*) with which to agree.
- (ii) If the goal has a value, its value is assigned as the value of the probe.

Also:

Move = Agree + Determine Pied-Piping + Internal Merge:
Some unvalued features on a head may have an "EPP" property: they aren't satisfied by Agree alone, and force Move.

The "back story" behind Agree according to MI/DbP:

- Agree exists because it deletes uninterpretable features.
- Deletion of uninterpretable features is a requirement imposed by the interfaces between the syntax and neighboring systems.

But agreement is about valuation, not interpretability!

If there is a connection between valuation of *unvalued* features and deletion of *uninterpretable* features, as is conjectured in MI/DbP, then interpretability and valuation must go hand in hand. Chomsky thus proposes (3)

- (3) **Valuation/Interpretability Biconditional (Chomsky (2001b, 5))**
A feature F is uninterpretable iff F is unvalued.

- Biconditional (3) reflects the fact that syntax cannot predict whether the semantics will interpret a particular feature, but can see whether the feature is valued (Epstein et al. (1998)). Valuation in MI/DbP is in essence a *lexical encoding of interpretability*.

- (4) **Deletion of uninterpretable features**
Once an uninterpretable feature is valued, it can and must delete [phase-finally].

3. Innovations

- **Concerning (2), the nature of Agree:** If the existence of lexically unvalued features is simply a fact, the existence of the operation Agree is similarly a fact.

The *syntax of valuation* is debatable, however. We argue that the conditions on probe-goal relations in (2i) are essentially correct — but we argue for a view of the actual effect of Agree that is quite different from (2ii).

- **Concerning (3), the Valuation/Interpretability Biconditional:** The biconditional is odd and unlikely. Why should the *lexicon* couple the disparate properties of *interpretability* ("Does the item have a message to send to the semantics?") and *valuation* ("Are any syntactically relevant properties of the lexical item left unspecified?")?

We argue *against* the Biconditional.

- **Concerning (4), deletion of uninterpretable features.** We argue that there is truth to this hypothesis, though we modify it somewhat.

This hypothesis is also odd, however, and seems unlikely in a MI/DbP framework. After all: Let us suppose uninterpretable features are indeed poisonous to the semantics — and that such features must therefore delete. **Why should valuation of an unvalued feature be a precondition for deletion?**

We will not eliminate (a version of) (4) as a statement true of the grammar. We will argue, however, that if we adopt our innovations concerning the syntax of valuation and if we also abandon the Valuation/Interpretability Biconditional, we can *explain* why (4) is true in a satisfying manner. [Much of this material adopts and adapts ideas of Michael Brody.]

4. Some notes on the nature and aims of the effort

Lower-level problems addressed:

- Constraints on the interaction of T-movement and A-bar movement, *that*-trace effects.
- Constraints on distribution of clause-introducers *that* and *for* in English in subject vs. non-subject sentences.
- Existence and (many) properties of raising and ECM constructions understood without a special notion of "Defectivity".
- Complementation and case properties of V, N (and perhaps A) predictable across DP, CP and PP complementation [in progress].

Гласность and перестройка: Certain phenomena appear to fall quite outside the MI/DbP framework such that they cannot even be coherently discussed — but are readily understood (or at least discussable) in our approach. Possibly a good thing, though some people might disagree!

Examples:

- (i) The relation between features of T and morphology on V (likewise for D and N).
- (ii) The relation between clause-typing (declarative, question, etc.) and the features of *wh*- and non-*wh*-phrases

Higher-level questions addressed:

- What is structural case? Why do nominals bear structural case, and what is the relation between case-bearing elements and case-assigners?
- What accounts for the syntactic properties of the lexical categories N, V and A? What links their external distribution to their complementation properties?
- Do semi-functional categories like *v* exist, and — if so — where, how, and why?

Even higher-level questions:

- What properties (features) are "assembled" to form Lexical Items, and why those particular properties?
- What properties of Lexical Items are relevant to assembly in the syntax (Merge). How does the system work, and why should it work that way?

5. The alternative to (2ii): Agree and feature sharing

contra (2ii): "If the goal has a value, its value is assigned as the value of the probe."

- (5) **Agree as feature sharing**
 - (i) An unvalued feature *F* (a *probe*) on a head *H* at syntactic location α (F_α) scans its c-command domain for another instance of *F* (a *goal*) at location β (F_β) with which to agree.
 - (ii) Replace F_α with F_β , so that the same feature is present in both locations.

Predecessors: HPSG (*passim*; e.g. Pollard and Sag (1994)); Sag et al. (2003); Brody (1997, 158-159); Frampton and Gutmann (2000); Frampton et al. (2000).

Terminology:

- **Instance of *F*:** feature-location pair. A feature that has undergone Agree will thus have more than one instance.
- **Occurrence of *F*:** distinct features (which perhaps might undergo Agree, but have not done so yet).
- **Agree takes two occurrences of *F* and turns them into two instances of *F*.**

- (6) **Notation for Agree as feature sharing**

$F[73] \dots F[73] \dots F \text{ val}[73] \dots F[73]$

- A feature that has not participated in Agree will be indicated (where relevant) by an empty pair of brackets: $F[]$ if unvalued, or $F\text{val}[]$ otherwise.

Familiar things that happen:

- If a goal is valued for F, replacing the probe with the goal results in an instance of valued F occupying the location previously occupied by the unvalued probe.
- F on H may now serve as the goal for some later operation of Agree triggered by an unvalued, higher instance of F serving as a new probe.

Novelty #1:

- The result: a single feature F shared by three positions. (The process can iterate).

Novelty #2 (Frampton et al. (2000)):

- **Assignment view of Agree (MI/DbP):** Agree between an unvalued goal F_β and an unvalued probe F_α is either vacuous or impossible, depending on the exact specification of the procedure. If value assignment is allowed to apply vacuously, the derivation on this view contains two unvalued occurrences of F before Agree, and contains exactly the same two unvalued occurrences of F after Agree.
- **Feature sharing view of Agree:** Agree between two unvalued occurrences of F ($F_\alpha[]$ and $F_\beta[]$) is not vacuous. Its input is a pair of occurrences of F, and its output is a single occurrence of F with two instances:

$$(7) \quad \dots F_\alpha[] \dots F_\beta[] \dots \Rightarrow \dots F_\alpha[3] \dots F_\beta[3] \dots$$

If a later operation of Agree applies between one of the instances of unvalued F and a distinct *valued* occurrence of F at location γ , the result will be a valued feature F present at three locations:

$$(8) \quad \dots F_\alpha[3] \dots F_\beta[3] \dots F_\gamma\text{val}[] \Rightarrow \dots F_\alpha[3] \dots F_\beta[3] \dots F_\gamma\text{val}[3] \dots$$

Crucially, F has been valued at *both* of its previous locations α and β as a consequence of an application of Agree that involves only one of these locations.

6. The alternative to (3): the independence of valuation and interpretability

contra (3):

"Valuation/Interpretability Biconditional (Chomsky (2001b, 5))

A feature F is uninterpretable iff F is unvalued."

- **Innovation:** No Valuation/Interpretability Biconditional (3). Valuation and Interpretability are *independent* [Inspiration: HPSG *passim*].
- **Result:** an enriched repertoire of features:

- (9) **Types of features** (boldface = disallowed in MI/DbP)

uF val uninterpretable, valued *iF val* interpretable, valued
uF [] uninterpretable, unvalued ***iF []*** interpretable, unvalued

- **We don't throw the baby out with the bathwater**

Baby: It is unvalued features that act as probes.

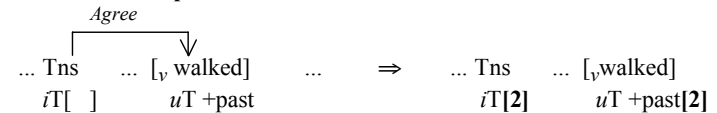
Bathwater: (3) (the interpretability/valuation biconditional)

The novel feature-types *iF []* and *uF val*

Example #1: T on V and Tns

Tns has interpretable T-features, but learns their value from the morphology of the finite verb. That is: Tns has ***iT []***, which probes and agrees with ***uT val*** on the finite verb.

- (10) **The relationship between Tns and the finite verb**

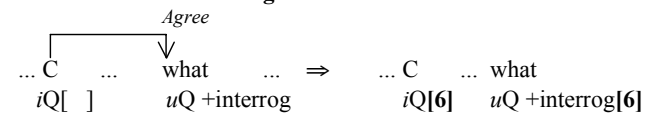


Example #2: "clause typing" and *wh*-phrases [Cheng (1991)]

The kind of C that triggers *wh*-movement has interpretable Q-features, but learns its value (relative clause, etc.) from the specifics of the *wh*-phrase it finds as a goal.

- (11) a. I wonder [*what* Mary bought ____]. (interrogative)
 b. *the book [*what* Mary bought ____] (relative; cf. *the person who...*)
- (12) a. I wonder [*why* she left]. (interrogative)
 b. the reason [*why* she left] (relative)
 c. *John left [*why* Mary left]. (free relative)

- (13) **Formation of an interrogative CP**



Theory comparison:

- In the MI/DbP approach, the feature that triggers *wh*-movement (e.g. *wh*) must also be *uninterpretable*. Thus there must be a distinct feature (e.g. *Q*) that gives C its interpretation as a question, relative clause, etc. Then there must be some *linking rule* to capture the fact that the type of *wh*-phrase that moves is related to the interpretation of the clause as a whole.

- An uninterpretable feature that triggers *wh*-movement (μ Q[] on C) does have a role to play, however. It is the feature on a C that hosts an intermediate step in successive-cyclic *wh*-movement.

[See also Gračanin-Yuksek (2004) on agreement within Romance and Slavic compounds; and Cable (in prep.) on the syntax of English *do*]

7. Sections 5 and 6 work together to explain (4): why μ F must agree with i F

- (4) **Deletion of uninterpretable features**
Once an uninterpretable feature is valued, it can and must delete [phase-finally].

Why is (4) true?

- For example, why *must* an uninterpretable valued feature like T on ν enter an Agree relation with interpretable T on Tns? Why don't we (freely) find a present tense finite verb in non-present-tense environments, e.g. **Mary can walks* — and allow the uninterpretable feature to delete, having never helped any instance of Tns receive its value?
- Likewise, why must uninterpretable valued Q on a *wh*-phrase enter an Agree relation with interpretable Q on C. Why can't a relative clause contain an interrogative *wh*-phrase whose Q-features simply never enter interpretation.

Towards an answer:

- (14) **Thesis of Radical Interpretability (Brody 1997)**
Each feature must receive a semantic interpretation in some syntactic location.

"[R]adical interpretability requires all syntactic elements to be semantically interpretable, but not necessarily actually interpreted in a given [piece of] structure." Brody (pp. 143-144)

- Consequences of Radical Interpretability (14) for μ F:**

Consequences for unvalued μ F[]: It must become an instance of F which is interpreted in some position or other. **Also: Interpretation has valuation as an obvious precondition.** Thus, μ F[] must undergo Agree with the result that it is (1) valued and (2) semantically interpreted.

Consequences for valued μ F ν al[]: It too must become an instance of F which is interpreted in some position or other.

- Thus: μ F must undergo Agree if (14) is correct — whether μ F is lexically valued (an innovation of this paper) or unvalued.**

8. Structural case as uninterpretable Tense: Pesetsky & Torrego 2001

Effects claimed to belong together

- (15) **Tns-to-C asymmetry in matrix questions (Koopman 1983)**

[non-subject *wh* --> "optional" Tns-to-C]

- a. What a nice book Mary read __!
b. What did Mary read __?

[subject *wh* --> no Tns-to-C]

- c. Who __ read the book?
d. *Who did __ read the book?/*What a nice person did read the book!

- (16) **Belfast English: Tns-to-C asymmetry in embedded declaratives**
(Henry 1995, 108-9; p.c.)

[non-subject *wh* --> (optional) Tns-to-C movement]

- a. Who did John say [did Mary claim [had John feared [would Bill attack __]]?

[subject *wh* --> no Tns-to-C movement]

- c. Who did John say [__ went to school]
d. *Who did John say [did __ go to school]? (bad unless *do* is emphatic)

- (17) **"That-trace effect" (Perlmutter 1971)**

[non-subject *wh* --> optional *that*]

- a. What do you think [Mary read __]?
b. What do you think [that Mary read __]?

[subject *wh* --> no *that*]

- c. Who do you think [__ read the book]?
d. *Who do you think [that __ read the book]?

Pesetsky & Torrego (2001): The Tns-to-C asymmetry and the *that*-trace effect are instantiations of the same phenomenon.

- (18) **Nature of English *that***

That is not C, but an instance of Tns moved to C.

- (19) **Nature of English C**

C is a null morpheme.

- The relation between *that* and Tns in its original position is akin to "clitic doubling" and "partial *wh*-movement".

- (20) Juan la vió a Mafalda.
Juan her-ACC saw to Mafalda
'Juan saw Mafalda' (Jaeggli 1982)

- (21) Was glaubt Hans mit wem Jakob jetzt spricht?
what believes Hans with whom Jakob now talks
'With whom does Hans believe that Jakob is now talking?'
(McDaniel 1989, 569)

- (22) **Attract Closest F (ACF)** [simplified from Chomsky 1995, p. 296]
 A probe uF on α takes β as a goal if
 (i) β bears F; and
 (ii) β is c-commanded by α ; and
 (iii) no γ that also bears F c-commands β and is c-commanded by α .

- TnsP and Spec,TnsP are thus equidistant from C.

- (23) **Head Movement Generalization**
 Suppose a head H attracts a feature of XP as part of a movement operation.
 (i) If XP is the complement of H, copy the head of XP into the local domain of H.
 (ii) Otherwise, copy XP into the local domain of H.

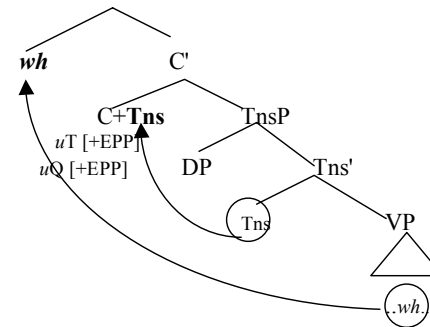
- Thus, if a feature of C probes a feature on TnsP, and has the EPP property, the result is Tns-to-C movement.

(24) **The nature of nominative case**
 Nominative case is unvalued uT [] on D. [cf. Haerberli (1999); Williams (1994)]

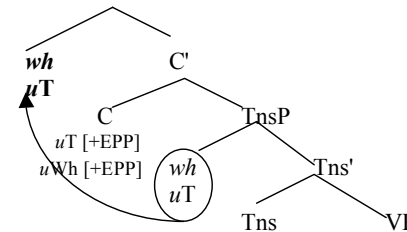
- Thus, the nominative *wh*-phrase is one of the goals probed by unvalued uT on C, and movement of the nominative phrase to Spec,CP can satisfy the EPP property of this feature.
- Tns to C can do the same job.

- (25) **uT feature on subject is marked for deletion by Tns before it moves to Spec,CP...**
 $[_{TnsP} [_{DP} \text{subject}, \#T, \phi]_i [T, \#\phi] [t\text{-subject}_i \text{ bought } the \text{ book}]]$
 but is not deleted until at least CP is complete.

- (26) **The Tns-to-C asymmetry**
 a. $[C, uT [], iQ []] [_{TnsP} [Mary, uT] Tns [_{VP} \text{read} [what, uQwh]]]$
 closest T: subject *Mary* and T
 closest Q: object *what*



- b. $[C, uT [], iQ []] [_{TnsP} [who, uT, uQwh] Tns [_{VP} \text{read } the \text{ book}]]$
 closest T: subject *who* and Tns
 closest Q: subject *who*



Why is Tns-to-C not merely unnecessary, but impossible when the nominative subject is extracted?

- $Q []$ on C probes the nominative *wh*-phrase, and satisfies its EPP feature by *wh*-movement of the subject to Spec,CP.
- $uT []$ on C takes as goals two equally close phrases: TnsP and Spec,TnsP. In principle, either phrase could move and satisfy the EPP feature of uT :
 1. If TnsP is picked, EPP satisfaction for uT on C will require Tns-to-C movement in addition to independently necessary *wh*-movement.
 2. If the nominative Spec,TnsP is picked, EPP satisfaction for uT on C is accomplished by movement of the *wh*-phrase that must move anyway.

(27) **Economy of movement**
 The EPP properties of uF on a head H are satisfied by the smallest possible number of movement operations.

9. Should we like hypothesis (24)?

What P&T wrote in 2001:

Long-standing controversy in linguistics:

Do purely formal grammatical features (features with no semantics) exist?

Most minimalist position:

No. The lexicon is nothing but a pairing of sounds/gestures and meanings.

- This is the position dubbed "Extreme Functionalism" by Newmeyer (1998). A non-starter, rarely defended, because features like *nominative case* look like counterexamples.

A minimal weakening of Extreme Functionalism (P&T 2001)

- Purely formal grammatical features do not exist.
- All grammatical features have a semantic value.
- But: they sometimes occur in positions where they do not express their value.

Relevance to nominative case:

Nominative case would be a counterexample (as would accusative case) if it were a feature with no semantics. If nominative case is uT , it has semantics after all — just not semantics that it gets a chance to express.

Update 2005: We do not need to relativize "Extreme functionalism"

- If Agree is feature-sharing, then the right principle is simply the "Thesis of Radical Interpretability, seen in (14):

(14) **Thesis of Radical Interpretability (Brody 1997)**
Each feature must receive a semantic interpretation in some syntactic location.

"[R]adical interpretability requires all syntactic elements to be semantically interpretable, but not necessarily actually interpreted in a given [piece of] structure." Brody (pp. 143-144)

— and indeed, Brody (2002) criticizes P&T's "Relativized Extreme Functionalism" just as we have here.

- On this view, then, the nominative case feature is interpreted as T on Tns.

10. Tns-to-C movement vs. subject movement in matrix questions

(28) **Tns-to-C movement obligatory in matrix *wh*-questions**

- What did Mary buy?
- *What Mary bought?

Question: Why is (28b) unacceptable, if *Mary* can raise to Spec,CP?

Answer: Perhaps it is not syntactically impossible. Exclamatives show a pattern opposite to (28):

(29) **Tns-to-C movement impossible in matrix *wh*-exclamatives**

- *What a silly book did Mary buy!
- What a silly book Mary bought!

(30) $[_{CP} [What\ a\ silly\ book]_i\ [_{Mary,\ #F}]_j\ [_{C,\ #T,\ #Wh}]]$
 $[_{TnsP}\ t-Mary_j\ Tns\ bought\ t-what\ a\ silly\ book_i\]]$?

(31) **Exclamative vs. interrogative interpretation**

A matrix CP whose head bears uWh is interpreted as an exclamative if a non-*wh*-phrase appears as one of its specifiers. Otherwise, it is interpreted as a question.

(32) *What a silly person just called me on the phone!

11. The formal syntax of Agree meets Case as uT : Defectivity" in Raising constructions

Case as uT [Pesetsky and Torrego (2001, 2004); Williams (1994, 11); Haeberli (2002)]:

- **Our earlier work:** predicts a range of phenomena previously attributed to a variety of different syntactic mechanism, including the *that*-trace effect, a comparable restriction on auxiliary fronting, an asymmetry in the availability of sentential subjects, and the distinct patterns of complementation characteristic of nouns, verbs and adjectives.
- **Here:** Structural case as uT in the present context allows the elimination of the special notion of "defectivity" invoked in the MI/DbP framework as an account of the properties of raising and certain other constructions.

Raising

(33) **Raising**
 [to [_{vP} Mary like the play] →

Step 1: form specifier of infinitival Tns
 [Mary to __ like the play] →

Step 2: form specifier of higher, finite Tns
 Mary Tns seemed [__ to like the play]

Properties of the construction:

- (i) Structural case is not licensed on the subject of the infinitive within the embedded clause, but is licensed in a higher clause.
- (ii) Infinitival Tns appears to attract the external argument DP from Spec,vP into its own specifier. Later in the derivation the same DP is attracted by the higher Tns into its specifier (the phenomenon known as Raising to Subject).
- (iii) The embedded clause does not display tense distinctions; instead, the temporal semantics of the embedded clause are determined by properties of the higher clause.

Evidence for Step 1 (movement to the specifier of the infinitival clause):

- Binding/anaphora (Fox (1999a, b); Grohmann et al. (2000); Lasnik (to appear); and Legate (2003); among many others)

(34) **Raising involves intermediate steps that count for Binding Theory**

Intermediate trace of raising counts for Principle A

- a. Bill_i seemed to Sue [__ to have seemed to himself_i [to be happy]].
- b. *Bill seemed to Sue_j [__ to have seemed to herself_j [to be happy]].²

Intermediate trace of raising counts for Principle B

- c. *Bill_i seemed to Sue [__ to have seemed to him_i [to be happy]].
- d. Bill seemed to Sue_j [__ to have seemed to her_j [to be happy]]

- Stranding phenomena such as Q-float (on certain analyses; Sportiche (1988); but see Torrego (1996), Bobaljik (1995, 2003)).

² The experiencer counts as c-commanding into the embedded clause:

- a. *Bill seemed to her_j [to like Mary_i].
- b. *It seemed to her_j [that Sue likes Mary_i].

Question:

- What properties of the infinitival Tns (*to*) force step 1 to take place?
- Some feature of infinitival Tns with an EPP property appears to act as a probe, entering an Agree relation with some feature of the subject — but this Agree relation does not seem to satisfy the subject's featural requirements, necessitating Step 2. What is unsatisfying about infinitival Tns?

Put raising aside for a moment:

- **In general: what feature of Tns acts as a probe/EPP trigger in the MI/DbP approach?**
iT co-occurs with *uφ*. It must be *uφ* that probes *φ*-features of DP. EPP is associated with *uφ*. It couldn't possibly be T itself, since T is interpretable on Tns (hence its name!).
- **In general: what feature of Tns acts as a probe/EPP trigger in the approach of this paper?**
 The T features of Tns are interpretable, but unvalued: *iT*[]. It is Tense that has the EPP property. Recall that case on DP is an instance of *uT*[].
- **But...**
 If *iT*[] probes *uT*[] on DP, Agree establishes a link between these features. How do they ever get valued?

Answer for finite/control v:

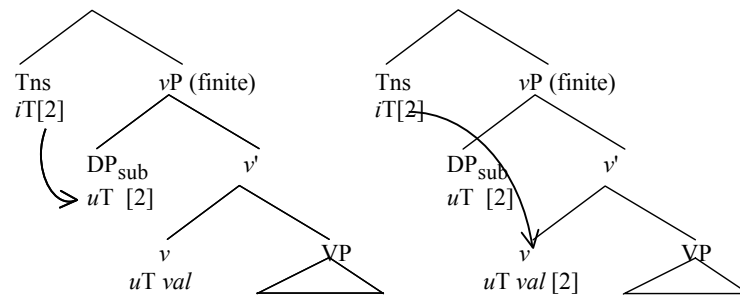
After *iT*[] on Tns probes DP, it also probes *v*, which bears *uT*[val]. This values *iT*[] of Tns and, via this Agree link, also values *uT* on DP. The Tense features of *v* are thus crucial.

Yes, there *is* *φ*-feature agreement with DP in finite clauses in languages like English. But we need not attribute key features of Tns (e.g. EPP) to the action of this feature.

(35) **T and nominative case in a finite clause**

step 1: Agree with subject (no valuation)

step 2: Agree with finite verb (valuation occurs)



Back to raising:

MI/DbP proposal:

- In a MI/DbP framework, the special properties of Tns in a raising infinitive (vis-à-vis the subject) must relate to its φ -features.
- Infinitival Tns in a Raising construction is "defective" — bearing an "incomplete" set of φ -features. When Tns is φ -incomplete, its $u\varphi$ -features may Agree with DP but do not value DP's uninterpretable Case features.

(36) **Case in Pesetsky and Torrego (2001, 2004)...**
(Structural) case is the name for uT on a nominal.

(37) **...contrasted with case in MI/DbP**
Case is a *sui generis* uninterpretable feature of nominals, with no interpretable counterpart. *It is unvalued initially, and gets valued as a special by-product of φ -feature agreement between DP and T/v.* Its actual value determined by whether it is Tns or v that enters φ -feature agreement.

Critiques:

- *MI/DbP*: DP needs nothing from Tns's φ -features, so it is odd that an incomplete set of φ -features on Tns should affect Tns's ability to value case on DP. (The entire φ /case interaction is in fact puzzling in the first place for MI/DbP.)
- *Pesetsky and Torrego (2001, 2004)* assumed something similar, and equally puzzling: that the presence of $u\varphi$ as a probe on Tns allows valuation of uT on DP — despite the reversal of the usual probe/goal c-command relations. This φ -T communication is also mysterious.

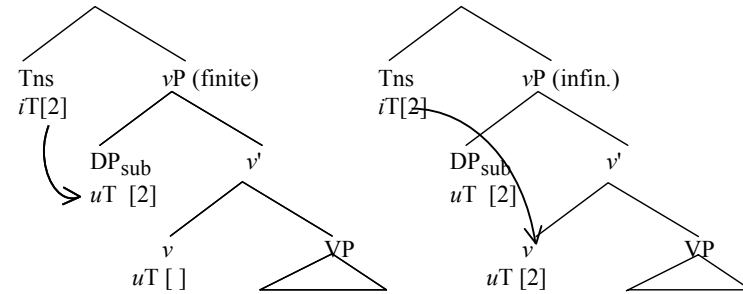
New proposal

In the current approach, the special properties of Tns in a raising infinitive (vis-à-vis the subject) need not relate to φ -features. T-features themselves may be at stake, thanks to the existence of interpretable unvalued features!

- **In a finite clause**, English T is interpretable and unvalued.
- $iT[]$ probes the T-features of a DP external argument, establishing an Agree Link, but does not get valued as a consequence.
- $iT[]$ next probes the features of v, and *does* learn its value from them.
- The v of a **raising infinitive** differs from finite v in bearing **unvalued $uT[]$** .
- As a consequence, $iT[]$ on Tns (*to*) cannot be valued by v, and also cannot value $uT[]$ on the external argument DP. That is, it cannot check case on the DP — though it does establish an Agree Link with it (and the DP raises to Spec,TnsP for EPP reasons).
- If the subject DP ultimately moves ultimately to a case position, it will value its uT — and via the Agree Link, value $iT[]$ on *to* back in its home clause.

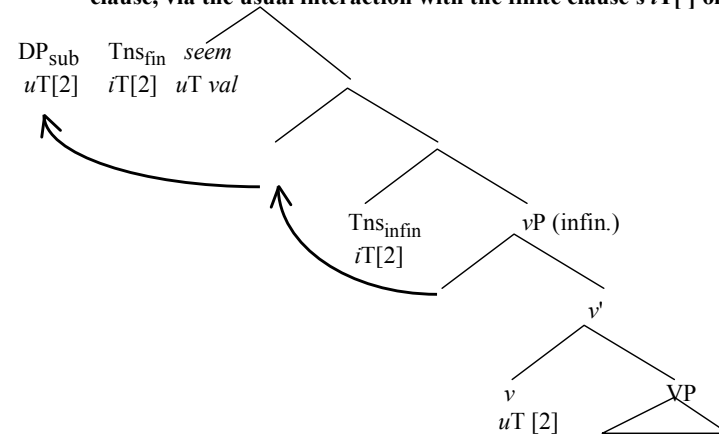
This account, like the DbP and MI account, invokes a kind of "defectivity" — but *there is nothing special about it.* "Defectivity" is just lack of valuation — a concept independently there for us, since Agreement is all about valuing the unvalued.

(38) **T and (non-assignment of) nominative case in a raising infinitival clause**
step 1: Agree with subject (no valuation) *step 2: Agree with finite verb (no valuation)*



Steps 3 and more:

Finite verb's uT val provides a value for uT on DP, iT in embedded infinitival clause, via the usual interaction with the finite clause's $iT[]$ on Tns.



- **A bonus:** Raising from clauses that have Agreement but have "defective" tense [Balkan languages: Iatridou (1993); Alexiadou and Anagnostopoulou (1999); among others].

- (47) **Nakajima's (1996) *whether/if* asymmetry**
 a. [Whether Bill was happy] was the main topic of discussion at our dinner.
 b. *[If Bill was happy] was the main topic of discussion at our dinner.
- (48) a. [Whether the election was fair] will be determined by the commission.
 b. *[If the election was fair] will be determined by the commission.

Filled good and filled bad

- (49) **Polish *to*-omission asymmetry**
 a. [To że tu jesteśmy] jest wszystkim wiadome.
 to C here we are is to-everyone known
 b. *[Że tu jesteśmy] jest wszystkim wiadome.

Unfilled good and unfilled good

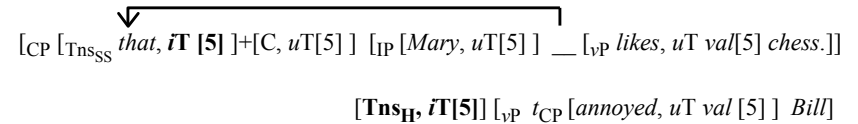
[Stowell (1981; 1982) / Pesetsky (1991)]:

- (50) a. *To learn the election results shocked me. [realis]
 b. To learn the election results would shock me. [irrealis/modalized]
 c. It shocked me to learn the election results. [realis + extraposition]
- (51) a. *To lose the game proved they were idiots.
 b. To lose the game would prove they are idiots.
 c. (?)It proved they were idiots to lose the game.
- (52) **To has not moved overtly to C**
 a. To learn the election results would shock me.
 b. Never to hear another symphony would be a tragedy.
 c. ?Cleverly to leave the door open is the sign of a good thief.

14. A covaluation question and what it teaches us

- T on Tns of the higher clause (Tns_H) and T on Tns of the sentential subject (Tns_{SS}) end up covalued.
 - Do T on Tns_H and T on Tns_{SS} actually behave for the semantics or morphology as if co-valued?
 - Looks like the answer is *no!* It is perfectly possible, for example, for the higher clause to show past tense, while the embedded clause is present. Other similar combinations are freely allowed as well:
- (53) a. That Mary likes chess annoyed Bill.
 b. That John ate dinner makes Tom happy.
 c. That the world will end tomorrow frightened the child.

(54) **Shared valuation of T in sentential subject and higher clause**



Proposal: The values of T relevant to Agree are not in fact the various tenses, but simply plus and minus.

- The various tenses do not correspond to values of a grammatical feature, but constitute different sorts of *encyclopedic* information that may be associated with a T feature that has a positive value (i.e. [iT +]).
 - Present or past tense semantics stand to the positive value for T much as the differing denotations of *dog* and *giraffe* stand to a positive value for an animacy feature.
 - The lexical entry for *dog* contains not only its grammatical features, but *encyclopedic specifications* (ES) associated with these features. The ES for the animacy feature of *dog* is what allows the word to pick out dogs to the exclusion of giraffes and other animate entities.
 - **This might make you nervous (but don't let it!):**
 The property of ES that is important to the present discussion is the fact that it appears to adhere to particular *instances* of features. Consequently, the ES of a feature of a lexical item does not participate in morphological agreement.
 - When Agree applies to two *occurrences* of a feature, only one of which is associated with an ES, *the ES information is not automatically shared* by the two positions in the output of Agree. Thus, T on Tns_H and T on Tns_{SS} may be co-valued, but have different ES interpreted differently on the two Tns's.
- This is really, really true!**
- Morphological agreement in a language may be sensitive to animacy, number, person, etc., but is typically not sensitive to fine-grained distinctions such as "dog" vs. "giraffe".
 - We are simply extending this observation to tenses.

[On the other hand, if needed, ES may be shared, as in raising constructions where ES on T of the finite Tns is shared by T of the Raising Tns.]

20. Complements of V:

What probes and values $uT[]$ on an (accusative) DP object of v ?

P&T 2004a's answer: a lower T.

(77) SUBJ $T_s [_{VP} v \ T_o [_{VP} V \ OBJ]]$

Technology of the proposal was MIDbP-based: $u\phi$ on T_o probes the ϕ -features of the object in VP, valuing uT on the object as a "reflex".

We didn't think of v as a plausible bearer of T-features, in part because we were not thinking about V as a bearer of T-features/

A simpler answer: v and V bear T-features, and do the job of accusative case assignment together. How it works:

Step 1: $uT[]$ on v first probes $uT[]$ on the DP object, establishing an unvalued agreement link.

Step 2: Next, $uT[]$ on v probes $uT \text{ val}$ on (finite) VP, which values the feature on DP object as well (i.e. assigns/checks case).

(78) **Accusative case**

Tns	vP (finite)		
		DP_{sub}	v'
		v	<i>step 1</i> VP
		$uT [2]$	
		DP_{obj}	V
		<i>step 2</i> $uT [2]$	$uT \text{ val}[2]$

Note: In this approach, accusative case in a finite clause comes from the T features of V, an echo of both traditional-grammar and GB views of accusative.

But the T features of v are crucial players as well, an echo of hypotheses more standard in Minimalist work.

No PP option for direct objects of V

(79) Sue broke (*of) the glass.

(80) **Special property of verbal complementation**

The direct object of a verb must bear valued ϕ -features. (PP does not bear $i\phi$ -features.)

21. Complements of N:

• **No bare DP option for direct objects. Only a PP option:**

(81) Sue's destruction *(of) the city

(82) **Special property of nominal complementation**

The direct object of N *must* bear $iT \text{ val}$.

Parallel facts about CP complementation!

(83) **That obligatory in finite CP complement of N (Stowell 1980, 1981)**

a. I liked your proof that Mary could not have committed the crime.

b.* I liked your proof Mary could not have committed the crime.

c. My demonstration that Sue was insane was accepted by the court.

d. *My demonstration Sue was insane was accepted by the court.

(84) **Only irrealis allowed in complement of N**

a. nominalizations of realis-selecting predicates

*Mary's hate/hatred to ride in the back seat

*Sue's love to solve problems

*Bill's luckiness to win the lottery

*Bill's dare to leave

*Bill's help to leave early

*Bill's neglect to leave early

*Bill's venture to leave at midday

*John's dislike to go home

*Bill's bother to leave early

*Bill's condescension to leave

*Bill's disdain to leave early

*Bill's management to leave early

*Bill's omission to leave early

*Bill's scorn to leave early

b. nominalizations of irrealis-selecting predicates

Mary's desire to win

Bill's agreement to leave early

John's wish to be allowed to school

Bill's attempt to leave early

Bill's consent to undergo the operation

Bill's demand to leave early

Bill's hope to leave early

Bill's learning to leave early

Bill's plan to leave early

Bill's promise to leave early

Bill's refusal to leave early

Bill's resolution to leave early

Bill's undertaking to leave early.

Harry's need to be accepted

Bill's arrangement to leave early

Sue's eagerness to win the lottery

Bill's choice to leave early

Bill's decision to leave early

Bill's endeavor(s) to leave early

Bill's intention to leave early

Bill's offer to leave early

Bill's preparation(s) to leave early

Bill's proposal to leave early

Bill's request to be allowed to leave early

Bill's struggle to leave early

Bill's vow to leave early

• **No such restriction on complement of A:**

- (85) **Optional *that* in CP complement to A**
 a. Mary is certain (that) the world is round. (cf. *Mary's certainty the world is round)
 b. Bill is aware (that) Mary left early. (cf. *Bill's awareness Mary left early)
- (86) **Realis infinitival complements to A**
 a. Mary was happy to learn the election results.
 (cf. *Mary's happiness to learn the election results)
 b. Sue was lucky to pick a topic that no one had worked on.
 (cf. *Sue's luck to pick a topic that...)
 c. John was very clever to figure this out.
 (cf. *John's cleverness to figure this out)
 d. Bill was careful to drive on the left in England.
 (cf. *Bill's care to drive on the left in England)

22. What distinguishes N, V, and A?

	a. PP	b. DP	c. <i>that</i> -clause or irrealis infinitive	d. <i>that</i> -less finite clause or realis infinitive
1. A-complement	✓	—	✓	✓
2. V-complement	—	✓	✓	✓
3. N-complement	✓	—	✓	—
4. subject of TnsP	—	✓	✓	—

(87) **Summary:**

- A-complement**
Must be self-sufficient (excludes b.).
- V-complement**
Must bear φ (excludes a.).
- N-complement nominal To**
Must bear T (excludes b. and d. — assuming phase-final deletion of valued uT).

23. Head Features

Assume:

- VP is selected by v and NP is selected by n

Restating the generalizations about N-complementation

- The fact that the complement of N must be T-headed suggests that (transitive) N bears unvalued uT [].
- But:** A DP/nP as a whole never satisfies the case filter simply by virtue of containing a complement headed by an item with valued T *val*.

So: n must bear an instance of unvalued uT [] that is incapable of probing NP to receive a value.

- On the other hand, we *know* that N bears lexically valued φ . These features are also present on D (and n). Thus n must bear an instance of unvalued φ [] that *can* probe NP to receive a value (and is in turn probed by φ [] on D).

Restating the generalizations about V-complementation

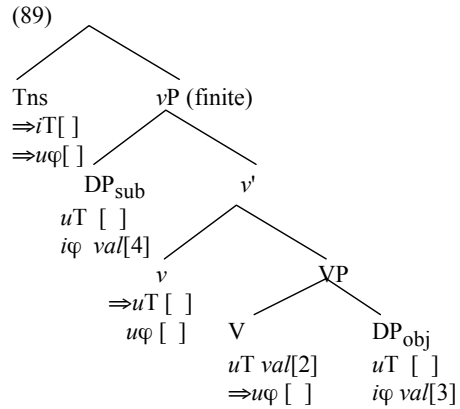
- The fact that the complement of V must be φ -headed suggests that (transitive) V bears unvalued $u\varphi$ [] (object agreement).
- Assume that the verb you hear in languages like English is usually v . The fact that v bears subject agreement, and not object agreement, indicates that v must bear an instance of unvalued $u\varphi$ [] that is incapable of probing VP to receive a value.
- On the other hand, we know that finite V bears valued T because of how accusative case-marking works. And we know also that v bears unvalued T [] that *can* probe VP to receive a value (and is in turn probed by iT [] on Tns).
- V in a raising infinitival bears unvalued T [], which does not become valued by a complement whose head contains T (e.g. a *that*-clause). Thus unvalued uT [] is incapable of probing its complement to receive a value.

(88) **Head Features**

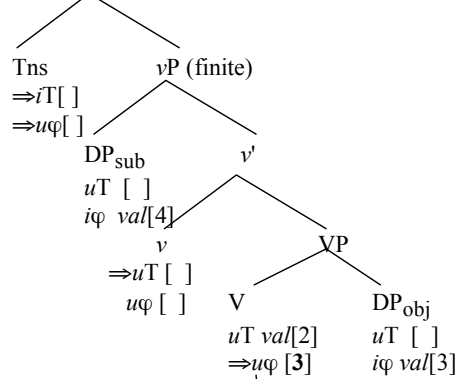
- A feature of X^0 that can act as a probe is a *head feature* of X^0 .
- A feature that is not a head feature may not act as a probe, but may be a goal.

	head	non-head
n	φ	T
v	T	φ
N	T	[φ : lexically valued]
V	φ	[T: lexically valued if finite]

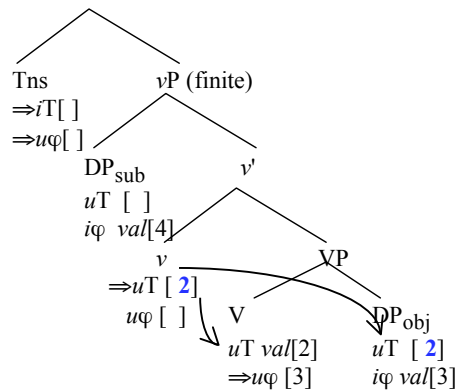
Life-cycle of a finite clause:



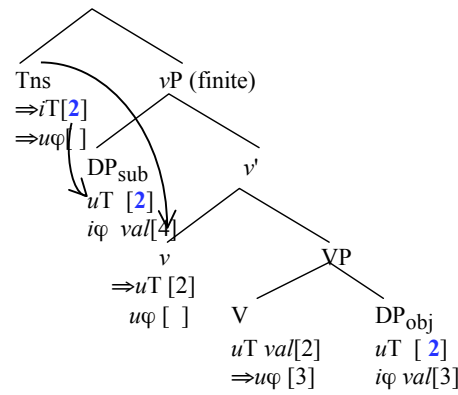
(90) **uφ on V probes, agrees with iφ on DP object**



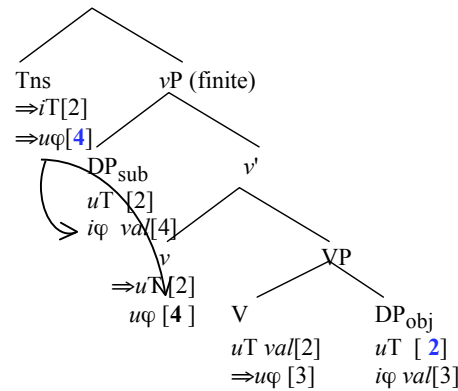
(91) **uT on v agrees first with uT on DP object [establishing a link], then with uT on VP [which values the link].**



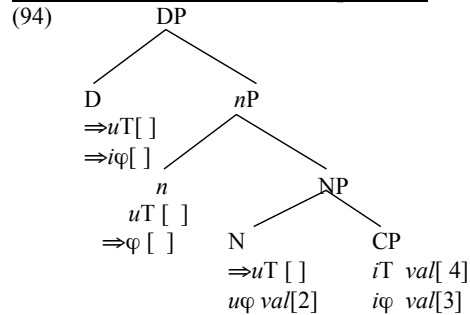
(92) **iT on T first probes DP_{sub}, establishing an agreement link. Next it probes vP, valuing itself and uT on DP_{sub} via the previously established link.**



(93) **uφ on T now probes uφ on vP, establishing an agreement link. Next it probes DP_{sub} valuing itself and uφ on vP via the previously established link.**



Structure of DP with a CP complement:



step 1: *uT* [] on N probes and is valued by T on CP.

step 2: *φ* [] on *n* probes and is valued by *φ* on N

uT [] on *n* is still unvalued

step 3: *uT* on D probes and establishes an unvalued link with *uT* on N

iφ on D probes and is valued by *φ* on *n* (which was valued by *φ* on N)

The Lego® theory of nouns and verbs

(95) Overall picture

<i>v</i> :	head	T	<i>n</i> :	head	φ
	non-head	φ		non-head	T
<i>V_{fin}</i> :	head	φ	<i>N</i> :	head	T
	non-head	T		non-head	φ

A discovery: With respect to headedness, *v*=N and *n*=V!

Links identified by the theory

- The fact that a nominal always "needs case" from outside is due to the same factor (*φ*-headedness) that leads verbs to reject PP in favor of DP/CP complements: only the *φ* [] features of *n* and V can probe.
- The fact that *v* agrees with the subject rather than the object is due to the same factor (T-headedness) that leads nouns to reject *that*-less/*for*-less CP complements: only T [] on *v* and N can probe.

What is in the lexicon?

- The lexical nouns and verbs we know and love (*dog*, *kick*, etc.) are instances of N and V.
- **N comes from the lexicon with valued *φ*-features.**
- **V comes with valued T-features (though in raising, some at least are unvalued).**

The generalization seems to be:

(96) **Head feature conjecture**

A category's head-feature bundle is the one it is *not* valued for.

[Raising verbs are possibly valued for some, but not all T-features...]

24. Evidence for the Lego® theory of nominal and verbal constructions

The argument in a nutshell

- Modifiers of NP look like the modifiers of *vP*.
- Modifiers of VP look like the modifiers of *nP*.

(97) **Adverbs in NP** [(a-c) from Fu, Roeper and Borer (2001)]

- Kim's explanation of the problem to the tenants thoroughly (did not prevent a riot).
- The occurrence of the accident suddenly (disqualified her).
- (While) the removal of evidence purposefully (is a crime), the removal of evidence unintentionally (is not).
- Her performance of the sonata so slowly (drew negative attention from the critics).
- Any withdrawal from Iraq precipitously (would run the risk that someone might discover the faked WMDs and foment a rebellion).

FRB's point (which we do not fully capture):

- There's a "VP" in process nominals...
- ...but not in other nominals:

- (98) a. *Kim's version of the event accurately
b. *the accident on the track suddenly.

- But other relational nouns do allow adverbs:

- (99) a. this owner unwittingly of a house in Tromsø
b. this captain unintentionally of a rather large yacht

Our point:

- The normal modifier of *v* (adverb) appears in N, and...
- ...the normal modifier of *n* appears in V!

- (100) **Adjectives in VP**
- a. They danced the waltz quite slow. [non-literary]
 - b. Mary ran fast.
 - c. Sue worked hard.
 - c. Sue slowly walked to the blackboard, but Tom walked there slower.

- **What is striking is the following parallel between FRB's surprising adverbs and our surprising adjectives:**

- (101) **NP adverbs must be post-nominal:**
*Her slowly performance of the sonata (drew the negative attention of the critics).
- (102) a. *His deliberately removal of the evidence (resulted in obscuring the case).
b. %His removal deliberately of the evidence (resulted in obscuring the case).
c. His removal of the evidence deliberately (resulted in obscuring the case).
- (103) **VP adjectives must be post-verbal**
- a. *They quite slow danced the waltz
 - b. *Mary fast ran.
 - c. (Mary slowly walked to the blackboard) *but Tom slower walked there.

Towards an analysis:

1. **Adverbs modify T-headed (lexically φ constituents:**
2. **Adjectives modify φ -headed constituents.**

25. What next?

- **Why do all these categories have φ and T features?**
- (104) **Ubiquitous feature conjecture**
All lexical items bear φ and T features. These are the *ubiquitous* features
- **A more exciting version: all lexical items bear all features. But this is false!**
 - **For example, if all lexical items had Q-features (e.g. *wh*), Q[] on C could never receive a +*wh*-value in a clause with a non-*wh* subject. The subject would always render C -*wh*.**
 - **Q thus looks like a feature that is not always present (cf. the notion of a *privative* feature — not quite right here, since Q has values).**
- (105) **Non-ubiquitous feature conjecture**
Some features are not present on some, but not all lexical items.

- **Other needs/why do the helper categories *v* and *n* exist? What is their link to transitivity? How are transitive verbs like *raise* that implicate *v* stored in the lexicon, and how do they differ from unaccusatives like *rise*?**

- (106) **The subcategorization conjecture**
A predicate's need for a syntactically present argument is a featural requirement like any other.

It consists of a lexically unvalued θ -feature, which receives its value by probing and agreeing with an argument that bears a valued counterpart.

- (107) a. *raise*, CAUSER[], THEME[]
b. *rise*, THEME[]

- If for semantic reasons CAUSER[] must be the specifier of *raise* (the VP-internal subject hypothesis) [alternative: CAUSER is not the head featurer] — it cannot be probed by V itself, since a head cannot probe its specifier.
- The CAUSER[] feature of V can only be valued with the aid of a higher category that also bears CAU[] and probes down.
- Meet *v*!
- *v* above *raise* bears CAUSER[], which first probes CAUSER[] on VP, resulting in feature-sharing. Then it probes CAUSER + on Spec,DP, thus valuing the feature on both *v* and V.

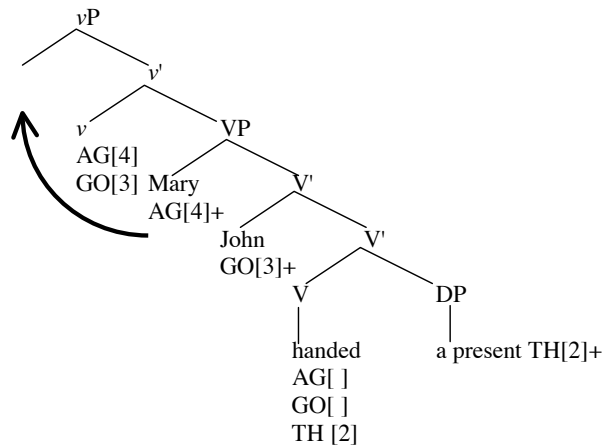
Note: On this view, *v*P will contain the higher argument of V, and thus the distribution of arguments across *v*P/VP will mirror the compositional semantics of predicate-argument combination.

*v*P may also make a semantic contribution of its own...

...but the semantic information proper to V is coming from V itself (in which respect, this system agrees with Ramchand's "First-phase syntax" proposals, contra Borer and others).

v can help with two arguments of V, if V allows multiple specifiers, but *v* does not. and if the first θ -feature of *v* has an EPP property that gets the top argument of VP out of the way for probing by the second θ -feature of *v*:

(108)



- But D is not lexically specified as a CAUSER, or an AGENT, or a THEME! And is there a little *v* for each θ -role?
- Exactly the right objection! A θ -feature on D is not lexically given, but *added in the syntax* — in violation of Chomsky's Inclusiveness Condition. Likewise the θ -feature on *v*...
- Arguments and *v*P are phases!

(109) **The phase conjecture**

Addition of a (non-ubiquitous) feature in the syntax is possible, and creates a phase.

- Likewise Q on C, Topic on T (in English), etc.

to be continued...