

# Auxiliary Verb Insertion

Elizabeth Cowper — University of Toronto Syntax/Semantics Project, January 22, 2010

## 1 Central claim

The three auxiliary verbs in English, *do*, *be*, and *have*, are all inserted to support stranded inflectional elements. The choice of which verb to insert is based on structural properties of the insertion context. *Have* is inserted during the syntactic derivation to support an inflectional element that has a TP complement; and *be* is inserted to support other stranded inflectional elements. *Do* is inserted at PF to permit the pronunciation of a Tense head not heading a TP.

## 2 Background

### 2.1 Features

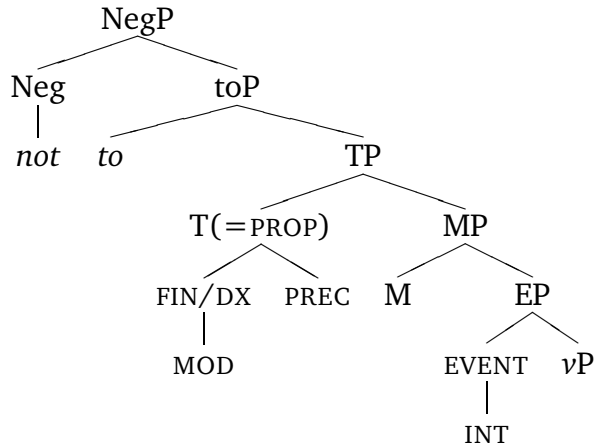
Feature-geometric theory of Infl (Cowper 2005); privative features in dependency relations:

(1)	Finiteness/Mood	Narrow tense	Viewpoint Aspect
	Proposition	Precedence	Event
	Finite/Deixis		Interval
	Modality		

- **Event** distinguishes eventive from stative clauses.
- **Interval** distinguishes imperfective from perfective events.
- **Proposition** distinguishes propositions from bare events or states.
- **Finite** and (temporal) **Deixis** are bundled in English. Deixis temporally anchors the clause (normally to the moment of speech); Finite licenses structural case and agreement.
- **Modality** (modal verbs) encodes either necessity or possibility.
- **Precedence** distinguishes past from non-past clauses.
- **Vocabulary items:**
  - ing* ⇔ Interval
  - es* ⇔ Finite/Deixis
  - ed* ⇔ Finite/Deixis + Precedence
  - en* ⇔ Precedence
  - could, would, etc.* ⇔ Modality + Precedence

## 2.2 Mapping to Syntax - the articulation of Infl

(2) Fully-expanded Infl:<sup>1</sup>



- EP: See Travis (in press). Also Borer (2005), though her EP is rather different.
- MP: hosts the non-featural (verbal) content of English modals. These are *woll*, *poss*, *necess*, etc. (Abusch 1985). They move to T to check a strong M feature of T<sub>MOD</sub>.
- TP: actually a projection of Proposition. Only propositional clauses can exhibit a contrast between present and past, so Precedence is a dependent of Proposition.
- toP: heads phasally defective clauses (Cowper and Hall 2001)
- NegP: Clausal negation.
- The EPP position: associated with the Infl system as a whole; appears on whichever projection is the highest.

## 3 Selection and Feature-Checking in Infl

C-selection implemented by feature-checking on Merge (Adger in press; Adger and Svenonius to appear). Unlike Adger, assume that s-selectional properties trigger Merge, while c-selectional category features, if present on the selecting head, are checked immediately on Merge.

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<sup>1</sup>The full structure never actually appears in a single clause, since infinitival *to* is in complementary distribution with the features Finite/Deixis and Modality, and with MP.

### 3.1 Category features and values for elements of Infl

- **Event** [uV/v]
  - + **INTERVAL** [-ing]: Values the inflectional feature of V under Agree. At spellout, V is pronounced with the suffix *-ing*. When Interval is present, Event can therefore be checked only by V, not by *v*.
- **M** [uV]
- **T (=Proposition)** [uV]
  - + **Precedence** [-en, -ed]: Values inflectional feature of V, either alone or in combination with Finite/Deixis. At spellout, V is pronounced either as the finite past tense form, if Finite/Deixis is present, or as the past participle, in the absence of Finite/Deixis.
  - + **Finite/Deixis** [-s, -ed] Values the inflectional feature of V, either alone or in combination with Precedence. At spellout, V is pronounced as the past tense form if T also includes Precedence, or as the present tense form otherwise.
  - + **Modality** [uM]: Attracts a modal verb such as *woll* (Abusch 1985), which moves and adjoins to T. This specification narrows, and thus overrides, the basic [uV] feature of T.
- **to** [uV]
- **Neg** [uT]: Neg attracts T, which moves and adjoins to Neg.

### 3.2 Other Features and values relevant to auxiliaries

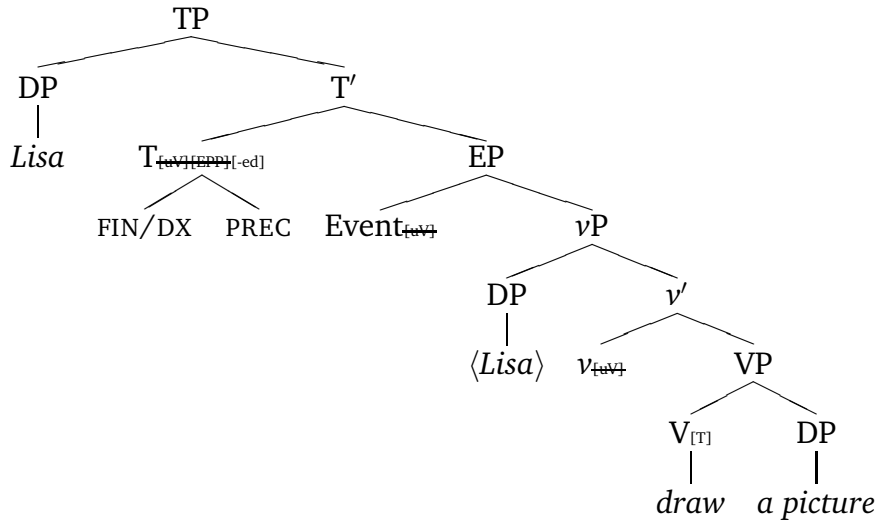
- **Light verbs** [uV]
  - +  $v_{\text{PASS}}$  [-en]: Values the inflectional feature of V. At spellout, V is pronounced as the past participle.
- **Lexical verbs**: Unvalued inflectional feature makes the verb available to check V-feature of an inflectional head. Remains available until the feature is valued. If never valued, pronounced as bare stem.
- **C<sub>[Q]</sub> strong** [uT]: Attracts T, which moves out of TP and adjoins to C.<sup>2</sup>

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<sup>2</sup>I abstract away from the fact, elaborated by Rizzi (1997), that the C system, like the Infl system, consists of several functional heads.

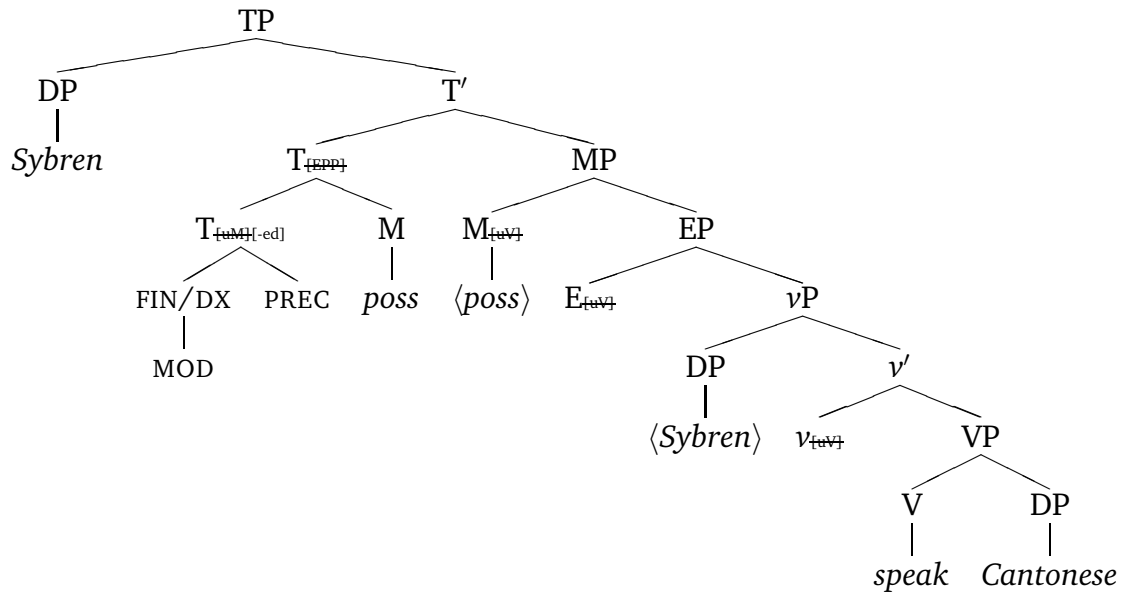
### 3.3 Two simple examples

(3) a. Lisa drew a picture.



- *Draw* checks uninterpretable V-features on *v*, E, and T.
- *Draw* is valued by T, and at PF is spelled out as *drew*.
- *Lisa* moves to spec/TP to check EPP on T.

b. Sybren could speak Cantonese.



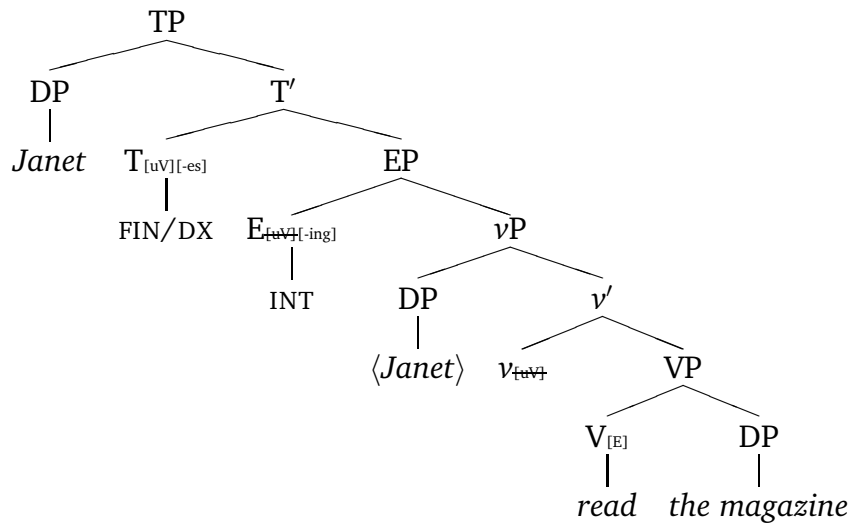
- *Speak* checks uninterpretable V-features on *v*, E, and M.
- Nothing values *speak*'s inflectional feature, so it is pronounced as a bare stem.
- *Poss* moves to T and checks M-feature of T. T values *poss*, which is pronounced as *could*.
- *Sybren* moves to spec/TP to check EPP on T.

## 4 Where do auxiliary verbs come from?

Claim: *Be* and *have* are not merged as Vs heading VPs. They are inserted to check categorial features of inflectional heads.

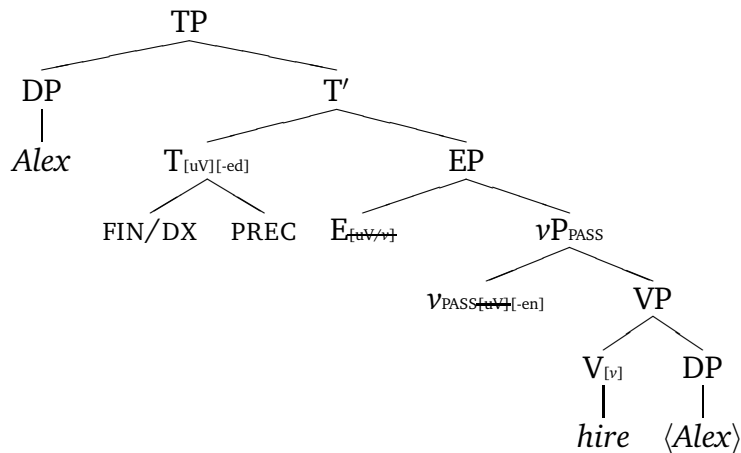
### 4.1 Auxiliary *be*

(4) a. Janet is reading the magazine.



- *Read* is valued by E[INT].
- No verb is available to check [uV] of T.

b. Alex was hired.

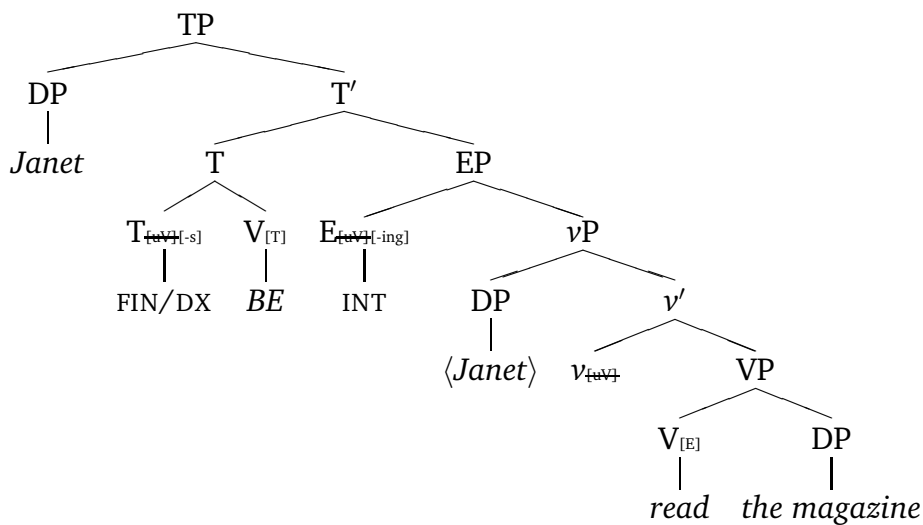


- *Hire* is valued by v<sub>PASS</sub>.
- E's [uv/V] feature is checked by v<sub>PASS</sub>.
- No verb is available to check [uV] of T.

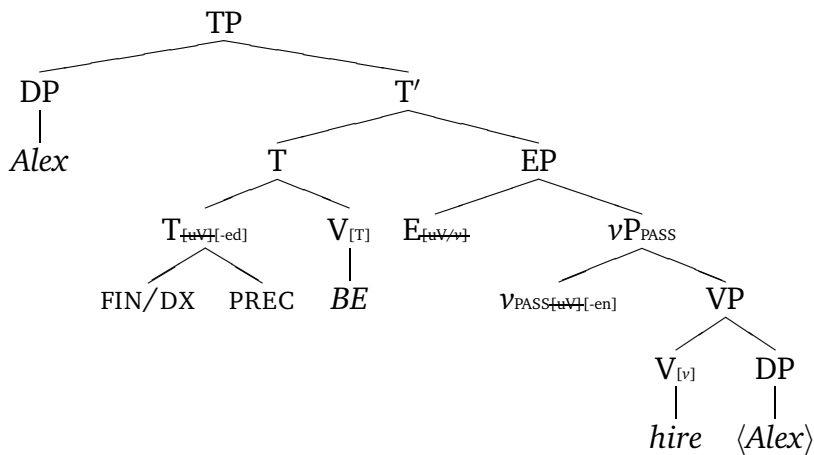
(5) **Stranded on Merge:** A head is stranded on Merge, or Merge-stranded, if it has an uninterpretable category feature that cannot be immediately checked.

(6) **BE-support:** The verb *be* is inserted immediately in a merge-stranded Infl head.

(7) a. Janet is reading the magazine.

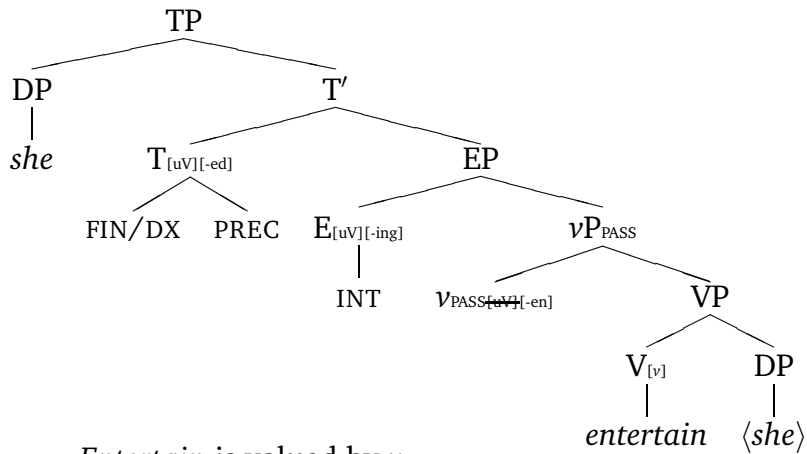


b. Alex was hired.



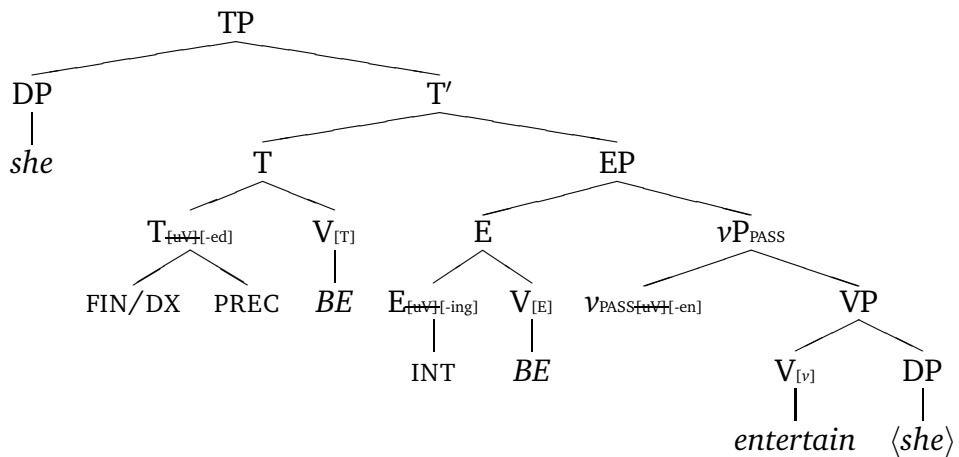
Sometimes two inflectional heads are merge-stranded:

(8) She was being entertained.



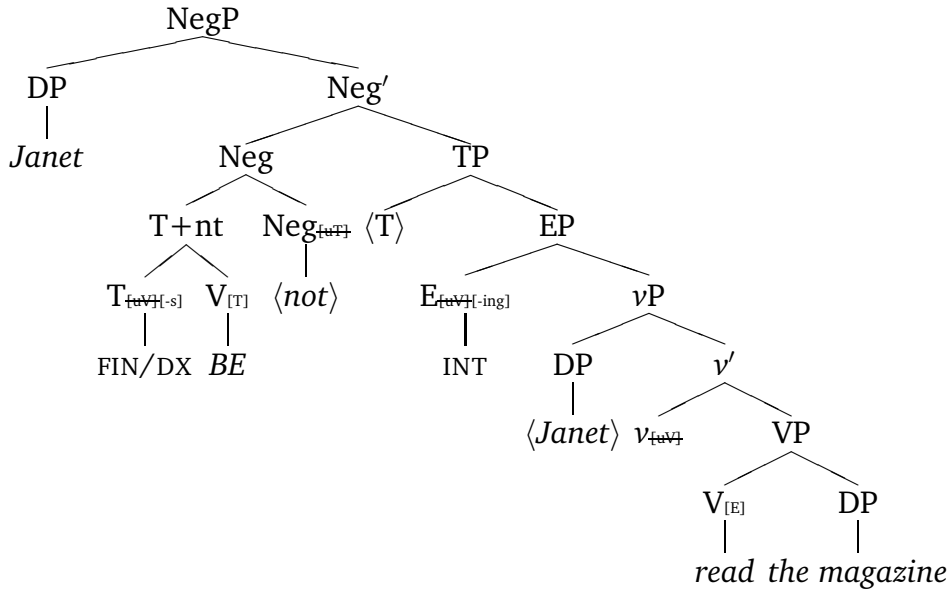
- *Entertain* is valued by v<sub>PASS</sub>.
- E and T are Merge-stranded, triggering *BE*-support.

(9) She was being entertained.



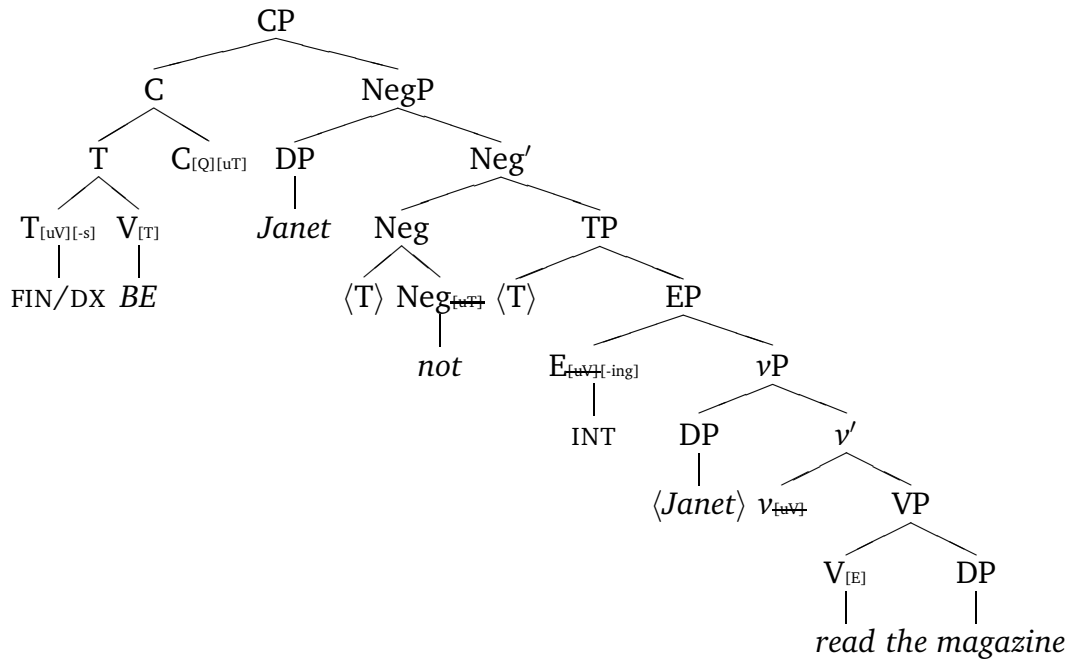
A nice result: Inserting *be* directly on the stranded inflectional head predicts, without further head movement, that if T moves to a higher inflectional head such as Neg or C, *be* will move as well:

(10) Janet isn't reading the magazine.



- T moves to Neg to check strong [uT] of Neg.
- *Not* optionally attaches to T as *n't*.
- *Janet* moves to spec/NegP to check EPP of Infl.

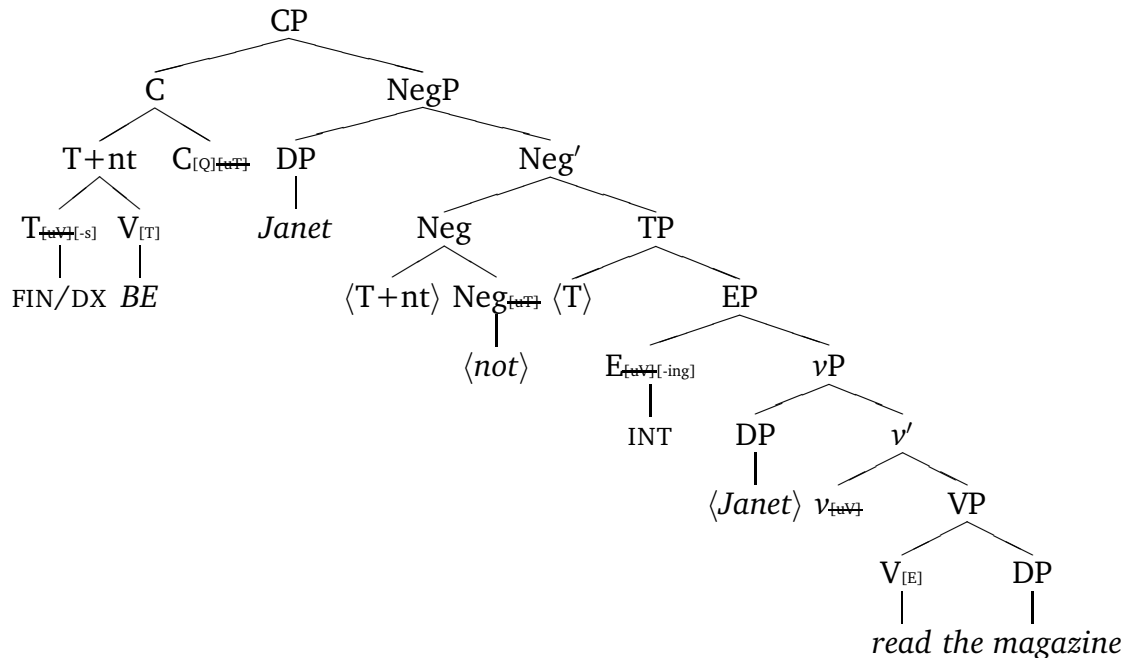
(11) a. Is Janet not reading the magazine?



- T exorporates from Neg, moving to C to check [uT] of C<sub>[Q]</sub>.



b. Isn't Janet reading the magazine?



- T incorporates from Neg, moving to C to check [uT] of C<sub>[Q]</sub>.
- Since *not* has attached to T, it moves as well.

## 4.2 What about copular *be*?

Does copular *be* head a full VP, or is it inserted to spell out a functional head? (Eide and Áfarli 1999, Cann 2003, Schütze 2004, Progovac 2006, others).

- If copular *be* is the highest verb in the clause, it moves to Neg and to C as auxiliary *be* does. Ordinary verbs don't move.

- (12) a. George isn't happy.  
b. Is Martha Scottish?

- (13) a. \*George seemsn't happy.  
b. \*Looks Martha Scottish?

- When copular *be* is the highest verb in the clause, it is not deleted in ellipsis constructions, just like auxiliary *be*. Ordinary verbs must be deleted.

- (14) Auxiliary *be*:  
Rint is going to Paris, and Lisa is <going to Paris> too.

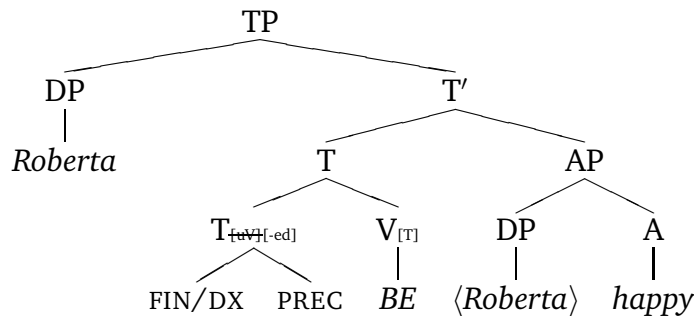
- (15) Copular *be*:  
a. Rint is ready to go, and Lisa is <ready to go> too.

- b. \* Rint is ready to go, and Lisa does ⟨be ready to go⟩ too.
- (16) a. Philip seemed worried, but Tanya didn't ⟨seem worried⟩.
- b. \* Philip seemed worried, but Tanya seemedn't ⟨worried⟩.

- Therefore, wherever copular *be* originates, it must end up in T if it is the first verb in the clause.

**Proposal:** Copular *be* is inserted by *BE*-support.

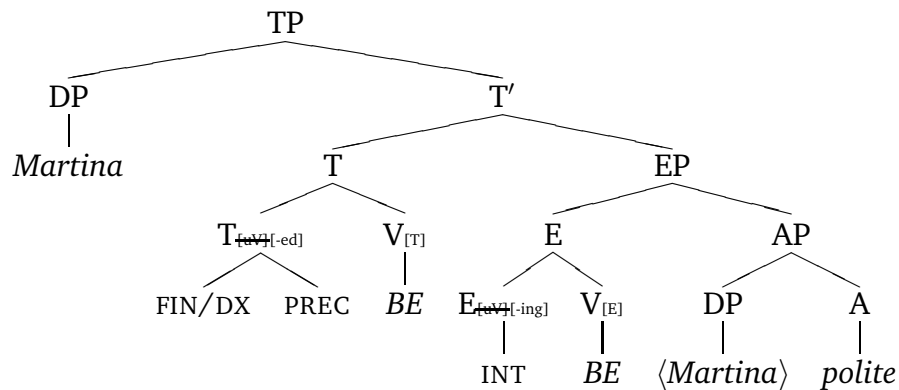
- (17) Roberta was happy.



### 4.3 What about eventive/agentive *be*?

**Proposal:** Eventive/agentive *be* is inserted by *BE*-support.<sup>3</sup>

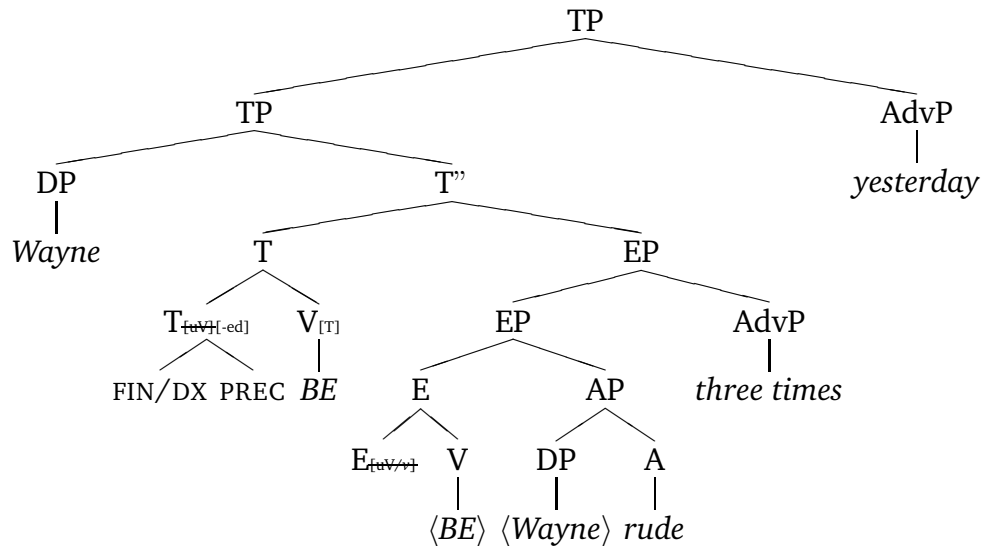
- (18) a. Martina was being polite.



- E[INT] is Merge-stranded, triggering *BE*-support.
- E[INT] values *be*, which is pronounced at PF as *being*.
- T is Merge-stranded, triggering *BE*-support a second time.
- T values *be*, which is pronounced at PF as *was*.

<sup>3</sup>Imperative sentences like *Don't be sad!* present additional complications. See section 5.

b. Wayne was rude three times yesterday.



- E is Merge-stranded, triggering *BE*-support.
- E assigns no value to *be*, leaving it available to check higher features.
- *Be* checks [uV] of T, moving to T in the process.

Compare (18b) to (19), repeated from (3a):

(19) Lisa drew a picture.

We know that *be* moves to T in (18b), and that *drew* doesn't in (19):

- (20) a. Wayne wasn't rude even once this morning.  
 b. Was Wayne rude at all this morning?  
 c. Why was Wayne rude so often today?

- (21) a. Lisa didn't draw a picture.  
 b. Did Lisa draw a picture?

For some speakers, eventive/agentive *be* acts more like a regular lexical verb:

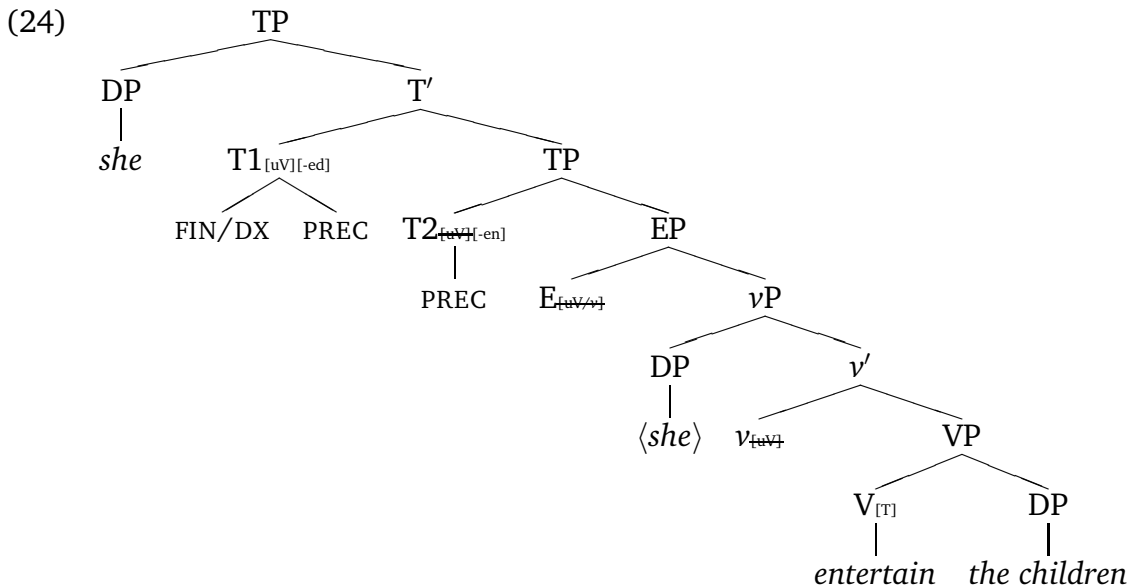
- (22) a. % Martina didn't be polite as I asked her to.  
 b. % Did Wayne be rude again? That's terrible.  
 c. % Why did Wayne be rude like that?

#### 4.4 Auxiliary have

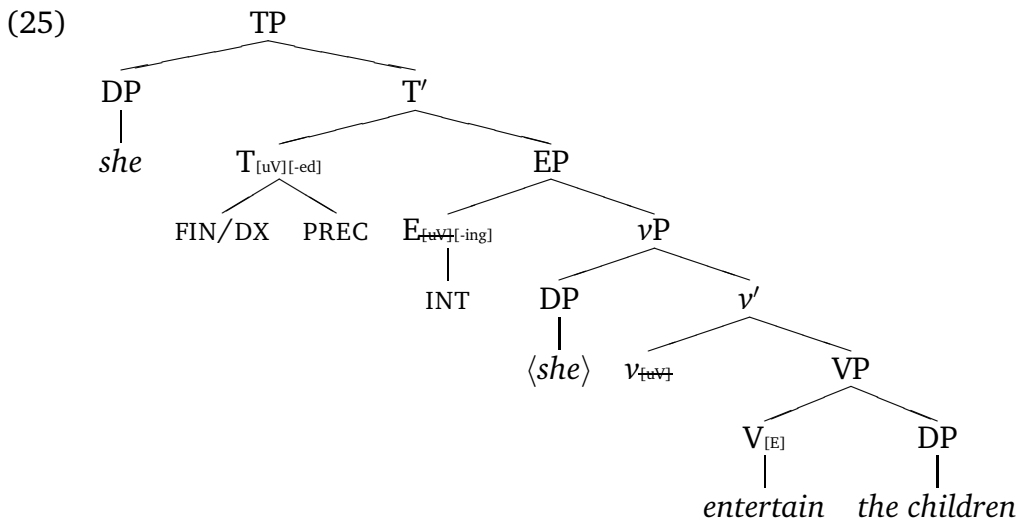
**Claim:** the choice between auxiliary *be* and auxiliary *have* can be made on purely structural grounds. Both are inserted to support Merge-stranded inflectional heads.

- (23) a. She had entertained the children.  
 b. She was entertaining the children.

**Optional question:** What defines a clause? Perfect clauses may have two instances of Precedence, and thus two instances of TP.



- *Entertain* checks [uv/V] of Event and [uV] of T2.
- T2 values *entertain*, which is pronounced as the past participle.
- T1 is Merge-stranded.



- *Entertain* checks [uV] of E[INT].
- E[INT] values *entertain*, which is pronounced as the present participle.
- T is Merge-stranded.

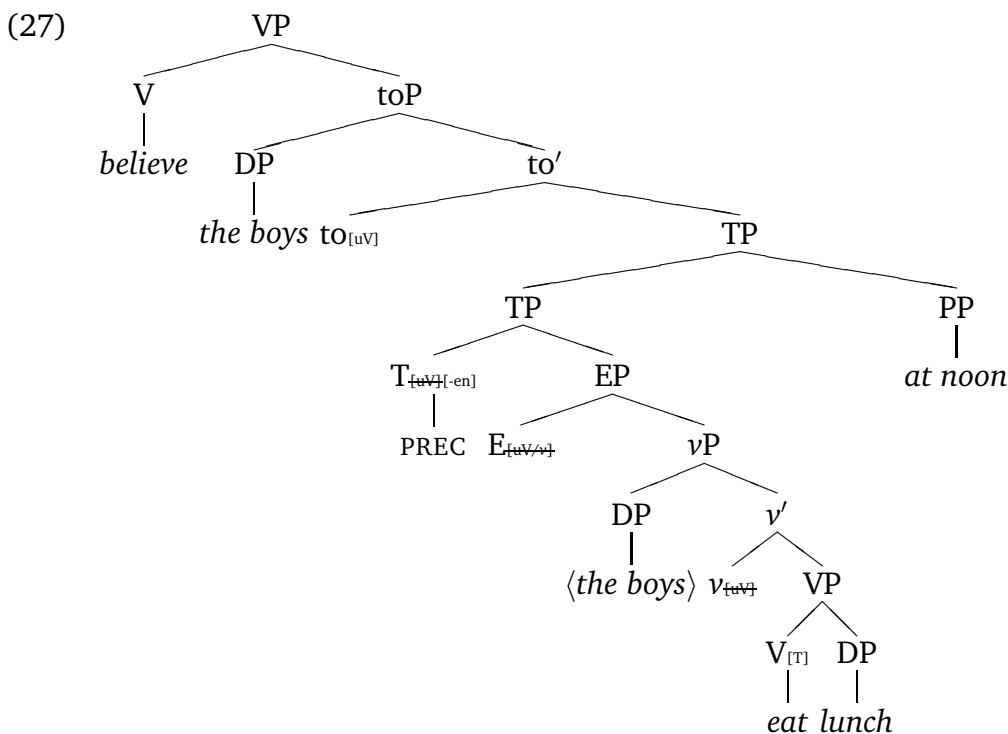
Why is *have* inserted in the first case, rather than *be*, as in the second?

A structural difference: In (25), the merge-stranded T has an EP complement, while in (24) the merge-stranded T has a TP complement.

It turns out that whenever a merge-stranded Infl element has a TP complement, *have*, rather than *be*, is inserted. Crucially, *have* appears in clauses that do not have the semantics of the perfect, and do not have two TPs.

Non-perfect past infinitive, compatible with a point adverbial:

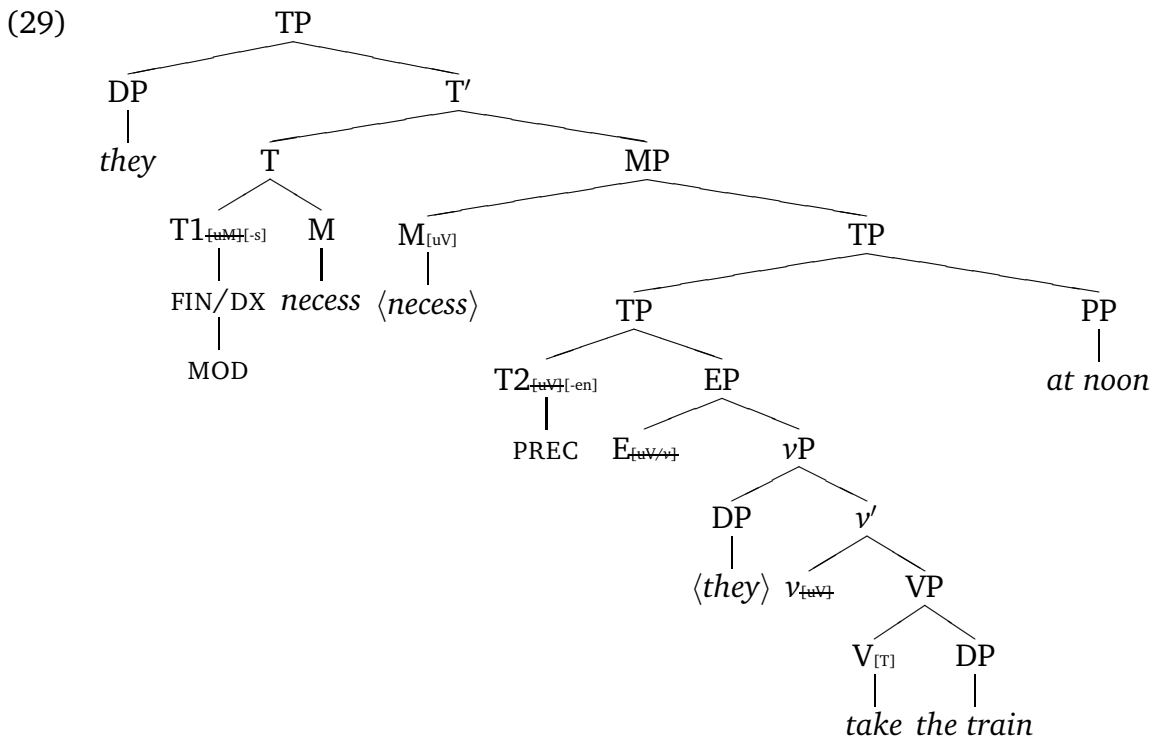
- (26) a. We believe that the boys ate lunch at noon.  
 b. \* We believe that the boys have eaten lunch at noon.  
 c. We believe the boys to have eaten lunch at noon.



- *Eat* checks [uV] of *v*, *E*, and *T*. Is valued by *T*, and ultimately pronounced as the past participle.
- *To* is Merge-stranded. It has a TP complement, so *have* rather than *be* is inserted.

Non-perfect past under a modal, also compatible with a point adverbial:

- (28) a. They must have taken the train at noon.  
 b. It must be that they took the train at noon.  
 c. \* It must be that they have taken the train at noon.



- *Take* checks [uV] of *v*, *E*, and *T2*. Is valued by *T2*, and eventually pronounced as the past participle.
- *M* is Merge-stranded. Has a TP complement, so *have* is inserted to check [uV] of *M*.
- *M* moves to check strong [uM] of *T1*.

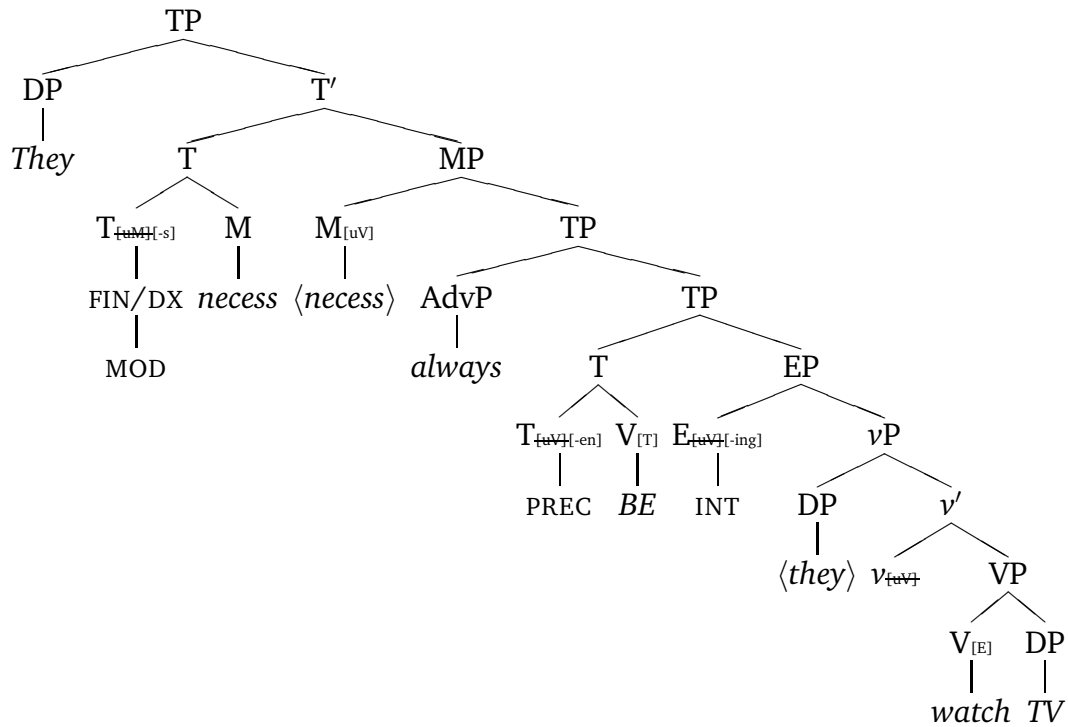
**BUT:** Exactly where is *have* inserted in (29)?

It can't be in *M* or it would move to with *M* to *T*, and then either to Neg (30a) or to *C* (30b).

- (30) a. i. They mustn't have taken the train at noon.  
 ii. \* They must haven't taken the train at noon.
- b. i. Might they have taken the train at noon?  
 ii. \* Might have they taken the train at noon?

It can't be in *T2* either. An adverb can intervene between *have* and *T2*:

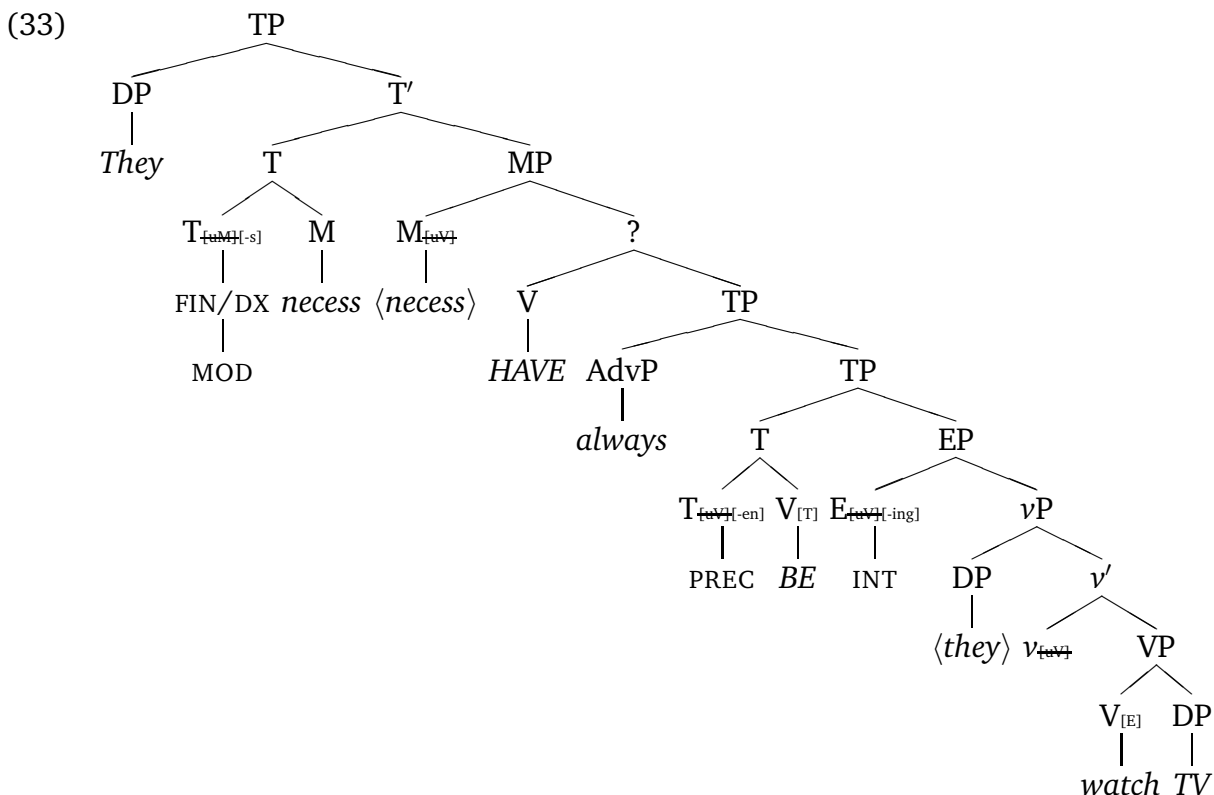
(31) They must have always been watching TV.



The same situation holds in infinitivals. *Have* can't be in the head of ToP, or in the head of the TP immediately below *to*:

- (32) a. We believe him to always have been living in Montreal.  
 b. We believe him to have always been living in Montreal.

**Proposal:** When *have* is inserted to support a non-affixal inflectional head, it is attached as in (33).



(34) **HAVE-support:** The verb *have* is inserted immediately to support a merge-stranded Infl head whose complement is a TP. If the head is affixal, *have* is adjoined to the head. If the head is not affixal, *have* is merged immediately below the head.

#### 4.5 Upshot

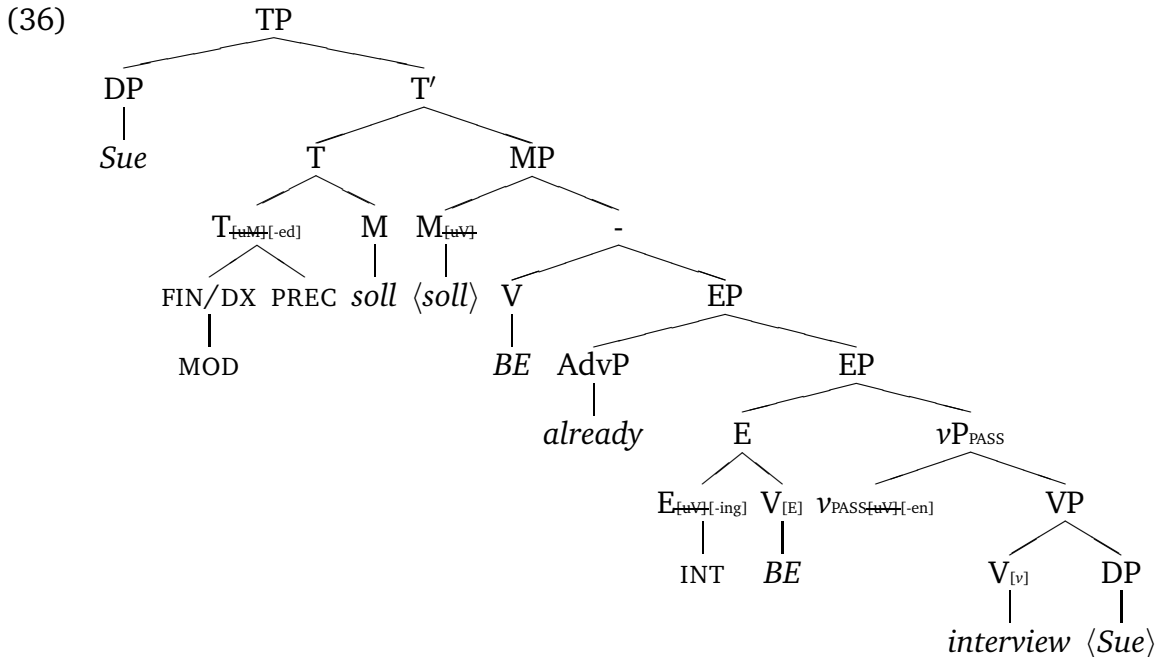
- Neither *have*, nor the past participle, nor the combination of the two, is specific to the perfect tense forms.
- What makes a clause perfect is the presence of two structurally adjacent non-modal TPs, the lower of which contains the feature Precedence (cf. Reichenbach 1947).
- Such a configuration always Merge-strands the higher T-head, which thus undergoes *HAVE*-support.

#### 4.6 *BE*-support revised

Like *have*, *be* is inserted between projections when it is required to support a non-affixal head.



- (35) a. i. The cars couldn't **be** being exported.  
 ii. \* The cars could **be-n't** being exported.  
 b. i. Must the furniture **be** being moved during the exam?  
 ii. \* Must **be** the furniture being moved during the exam?  
 c. Sue should **be** already being interviewed.



- *Interview* checks [uV] of  $v_{\text{PASS}}$ . Is valued by  $v_{\text{PASS}}$  and ultimately pronounced as the past participle.
- E[INT] is Merge-stranded, triggering *BE*-support.
- Inserted *be* is valued by E, and eventually pronounced as the present participle.
- M is Merge-stranded and non-affixal. Since its complement is EP, not TP, *be* is inserted between MP and EP.
- M moves to T to check strong [uM] of T.

- (37) **BE-support:** The verb *be* is inserted immediately to support a merge-stranded Infl head. If the head is affixal, *be* is adjoined to the head. If the head is not affixal, *be* is merged immediately below the head.

Since the set of environments for *HAVE*-support is a proper subset of those for *BE*-support, the Elsewhere Principle (Kiparsky 1973) orders the rules disjunctively, with *HAVE*-support applying first.

#### 4.7 What about non-auxiliary *have*?

A representative sample of non-auxiliary *have* uses (see Cowper 1989, and Brunson and Cowper 1992).

- (38) Simple transitive *have*:
- Meryl has a performance tomorrow night.
  - Sue has a headache today.
  - Sue has visitors today.
  - Michael has a new car.
  - Ronnie had an operation last week.
  - The children usually have a story at bedtime.
- (39) Causative *have*:
- Mary had Sue wash the car.
  - Mary had the car washed.
- (40) Experiencer *have*
- Alan had three people drop in yesterday.
  - Noelle had fifty dollars stolen.
- (41) Resultative *have*
- Arthur had three essays written by midnight.
  - Fred had the children laughing in no time.
  - The dogcatcher had the dog in the cage in thirty seconds.
- (42) Imperative/desiderative/modal *have*:
- Katie has to go home.
  - Angela has two papers to write.
  - That has to be the mailman at the door.
- (43) Existential/topical *have*:
- Evelina has a hole in her sock.
  - Evelina's sock has a hole in it. (cf. There's a hole in Evelina's sock.)
- In North American English, none of the instances of *have* in (38)-(43) is in T; none of them moves with T to Neg or to C<sub>[Q]</sub>.
- (44) a. i. Did Ronnie have an operation last week?  
ii. \* Had Ronnie an operation last week?  
b. i. Mary didn't have the car washed.  
ii. \* Mary hadn't the car washed.  
c. i. Did Alan have anyone drop in on him yesterday?

- ii. \* Had Alan anyone drop in on him yesterday?
- d. i. Fred didn't have the children laughing, Sue did.
- ii. \* Fred hadn't the children laughing, Sue had.
- e. i. Does Katie have to go home?
- ii. \* Has Katie to go home?
- f. i. Evelina's sock doesn't have a hole in it, does it?
- ii. \* Evelina's sock hasn't a hole in it, has it?

- *HAVE*-support inserts *have* only to support an element with a TP complement. Otherwise *be*, not *have*, appears. We would therefore expect *be*, not *have*, in most of these examples.
- Kim (in preparation) proposes that causative *have* and experiencer *have* are inserted in *v* heads that take an Applicative Phrase complement. There may thus be several contexts in which *have* is inserted.

So, set aside non-auxiliary *have* for now.

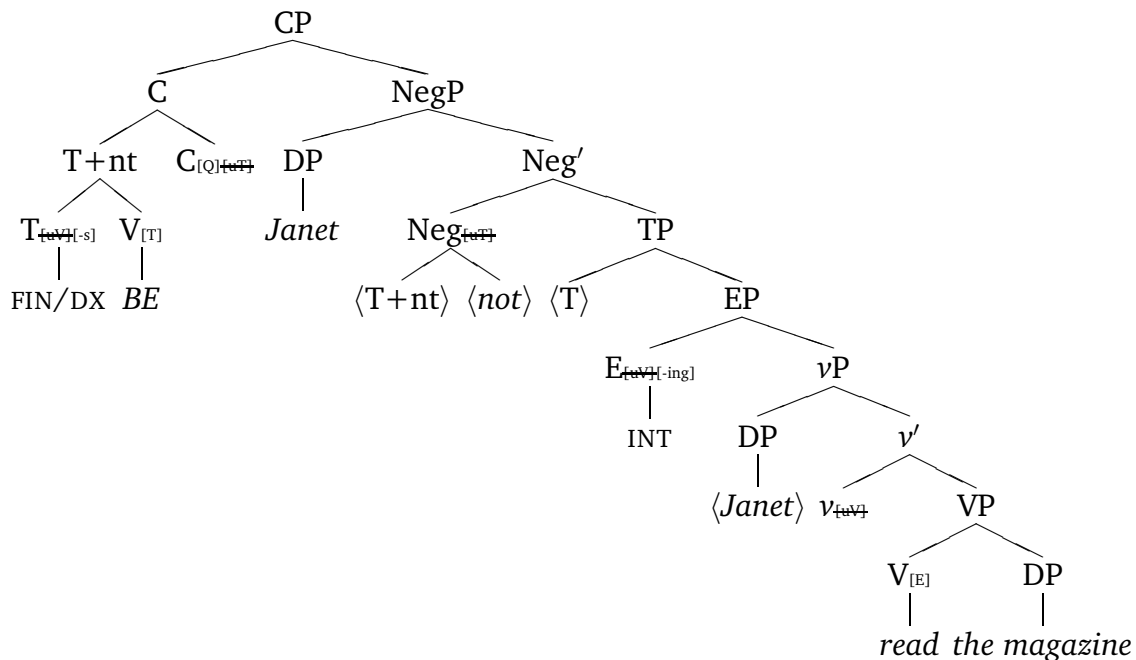
## 5 T outside TP: *DO*-support

### 5.1 When *T* moves to *Neg* or to $C_{[Q]}$

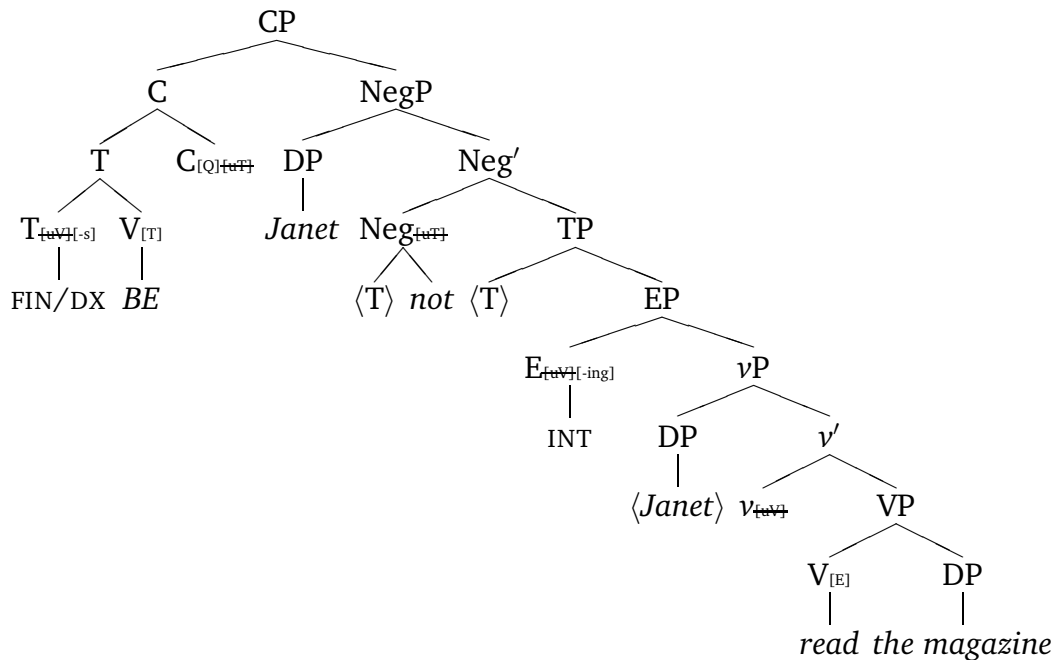
Assumptions:

- *Neg* and  $C_{[Q]}$  trigger overt movement of *T* to check strong [uT].
- The *T* head moves and adjoins to *Neg* or to  $C_{[Q]}$ .
- When *Neg* and  $C_{[Q]}$  both appear, *T* moves to *Neg*, and then excorporates from *Neg* and moves to *T*.
- Only if *Neg* attaches to *T* as *n't* does it move with *T* to  $C_{[Q]}$ .

(45) a. Isn't Janet reading the magazine?



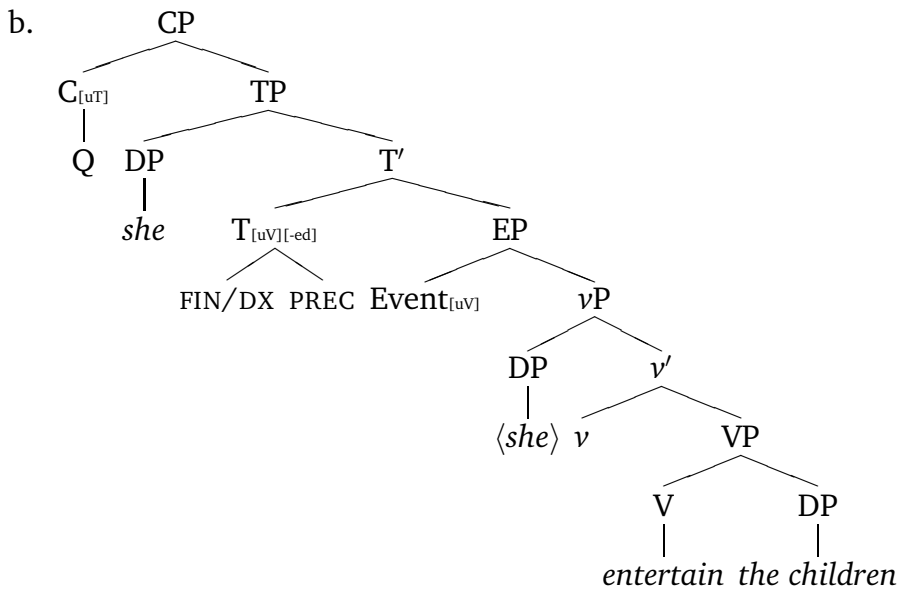
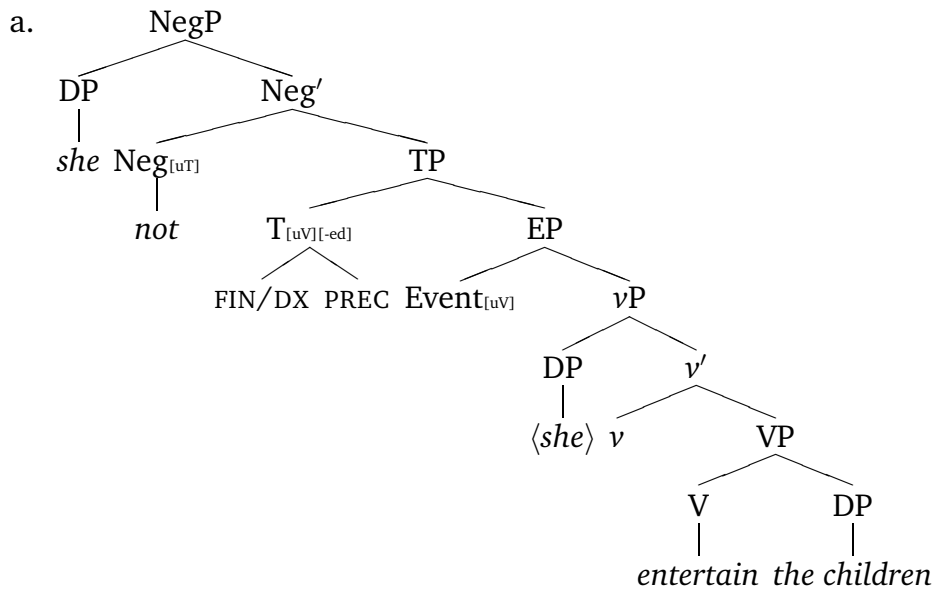
b. Is Janet not reading the magazine?



Two possibilities when T moves to Neg or to C<sub>[Q]</sub>:

- T already contains a verbal element—*be*, *have*, or a modal. The verbal element moves with T, and is pronounced in Neg or C<sub>[Q]</sub>.
- T does not contain a verbal element, as in (46).

(46) (cf. She entertained the children.)



The situation:

- We expect *entertain* to check [uV] of  $\nu$ , E, and T, and to be pronounced as *entertained*.
- Under a cyclic view of the syntax, there is no obvious way to prevent this checking, since both Neg and C are merged above TP.
- Somehow, movement of T to Neg and/or C must break the relation between T and V, preventing T from being spelled out on V, and stranding T in some fashion.
- I will not resort to feature de-checking.

Intuitively, the problem seems to be that the inflectional features of T cannot be realized without a verbal stem to host them. This problem arises only when T moves out of TP, to Neg or to C.

**Proposal:** If T is not dominated by the TP it heads, it must be phonetically realized.<sup>4</sup> Assume, standardly, that affixes cannot be pronounced unless they are attached to a stem.

Result: Any moved T that does not contain a verbal element will be stranded at PF.

(47) **DO-support:** *Do* is inserted at PF to permit pronunciation of a T not heading a TP.

Derivation of (46):

- When T is merged, it Agrees with V in the normal way, valuing the inflectional feature of V.
- When Neg or C<sub>[Q]</sub> is merged with TP, T moves to Neg or to C to check the strong T-feature on Neg or C<sub>[Q]</sub>.
- At spellout, the fact that T has moved out of TP makes the valuation of the inflectional feature of V unrecoverable, and V is pronounced, by default, as the bare stem *entertain*.
- Since T is outside TP, it must be phonologically realized, but it contains no stem to host the inflectional material
- *Do* is inserted in T at PF, permitting T to be pronounced..

*Do*-support thus has a different status from *be*-support and *have*-support, in that it is not triggered in the syntax by the need to check features, but rather at PF by the need to pronounce a T head that is not in TP.

## 5.2 Negated imperatives: T-support!

- (48)
- Don't eat the vegetables.
  - Don't be eating vegetables when the inspector arrives. (cf. \*Be n't eating vegetables...)
  - Don't be surprised when the bell rings. (cf. \*Be n't surprised...)
  - Don't be rude. (cf. Be n't rude.)

*Do* is always required in a negated imperative, regardless of the presence of an auxiliary verb or copular *be*. Why?

### 5.2.1 Assumptions required:

- Imperative clauses lack TP. They consist, minimally, of C<sub>IMP</sub> taking an EP complement.

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<sup>4</sup>Thanks to Daniel Currie Hall for the beginning of this idea.

- Negated imperatives have a clausal NegP between C<sub>IMP</sub> and EP.
- Neg has a strong [uT] feature, just as it does in ordinary sentences.

### 5.2.2 Evidence that matrix imperative clauses lack TP:

If imperatives lack TP, it is expected that none of the dependent features of T should be available.

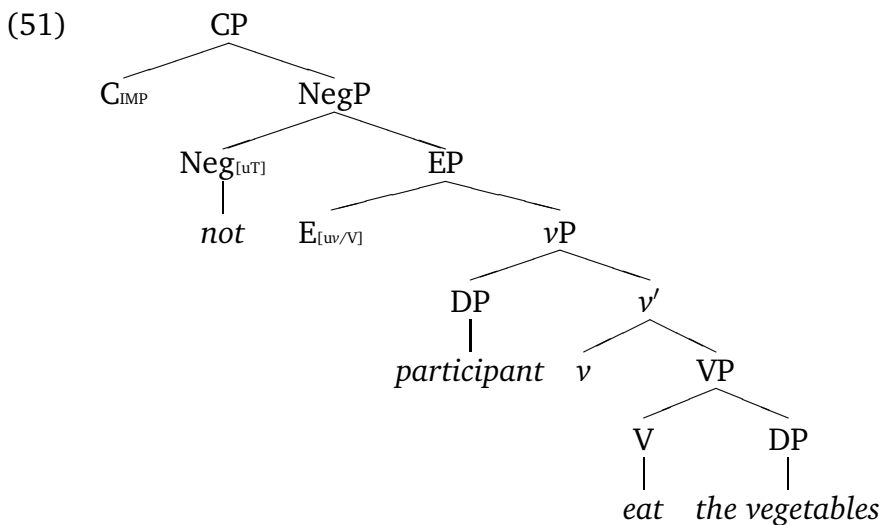
- There are no past imperatives—the feature Precedence cannot appear.

- (49) a. \* Have eaten your vegetables before the bell rings, or else!  
 b. \* Gave your papers to the TA before the deadline in order to receive full credit.

- Matrix imperatives, for syntactic reasons, cannot contain a modal—the feature Modality cannot appear.

- (50) a. ? Be able to recite this poem from memory by next week.  
 b. \* Can recite this poem from memory by next week.

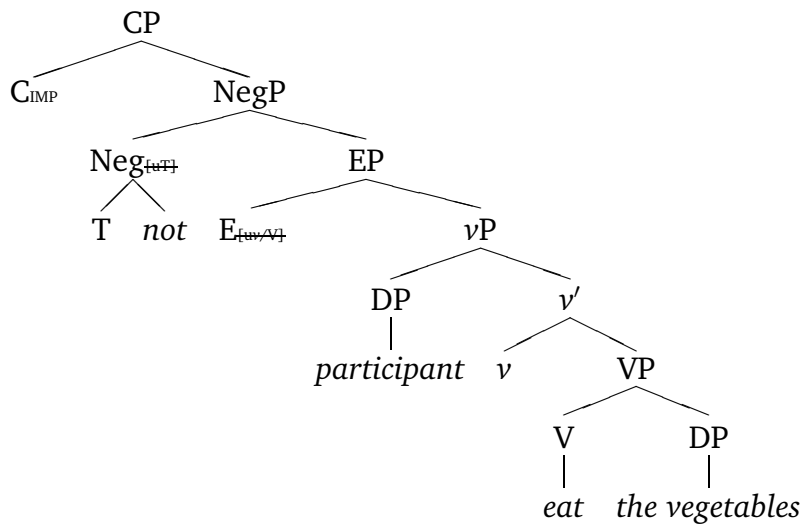
- Imperative clauses are not evaluated as true or false—the feature Proposition is absent.



- *Eat* checks [uv/V] of E.
- Neg is Merge-Stranded, with an unchecked [uT].

**Proposal:** Analogously to the insertion of *be* and *have*, the need to check an uninterpretable T-feature on Neg triggers the insertion of a bare T node. As with the inserted auxiliary verbs, the inserted T makes no semantic contribution to the clause; it is there merely to permit feature-checking.

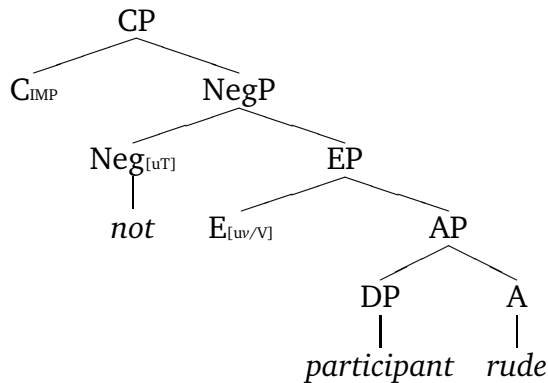
(52)



- T is inserted in Neg to check [uT] of Neg.
- At PF, T must be pronounced, since it doesn't head a TP.
- Since T contains no verbal element, *Do*-support applies at PF.

**A Nice Result:** We predict that *do* is inserted in negated imperatives even when the clause contains an auxiliary or copular *be*:

(53) Don't be rude.



- E is Merge-stranded. *Be* is inserted to check [uv/V] of E.
- Neg is Merge-stranded. T is inserted to check [uT] of Neg.
- *Not* (optionally) attaches to T as *n't*.
- At PF, *do* is inserted to permit pronunciation of T not heading TP.

## 6 Implications and Conclusions

- It seems that several semantically empty elements may be inserted by rule, rather than merged from the lexical array. How far can (or should) this be pushed? Where does it run



up against vocabulary insertion of functional elements?

- Could a similar story be told for other languages with more than one auxiliary verb? It might be worth looking at the have/be alternation in various Romance languages.

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