

Delayed-Merge: Some Evidence from Focusing Adverbs

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1. Introduction

- Various types of syntactic combinations:
 - (1) a. Theta-related c-selection (e.g. *John saw Mary.*)
 - b. A/A'-movement (e.g. *John was seen. What did he eat?*)
 - c. Adjunction (*John saw a red car. Mary is very smart.*)
 - d. Morphosyntactic adjunction (*John walks to the park.*)

- The proposals associated with (1d):
 - (2) a. Affix hopping (Chomsky 1957)
 - b. Base-generation and LF movement (Chomsky 1995)
 - c. Lowering – discussed and ruled out in Chomsky (1995: 139)
 - d. ‘Delayed’ morphosyntactic operation (Chomsky 2001, 2004):
 values are assigned to *uninterpretable features* via Agree.

➤ Can we delay syntactic operations?

- Recent minimalist views of syntactic derivation: (Chomsky 2000 *et seq*)
 - Indispensable operations of C_{HL} : Merge and Agree
 - Cyclicity condition (Chomsky 2000: 132):

- (3) Properties of the probe/selector must be satisfied before new elements of the lexical subarray are accessed to drive further operations.

➤ Conflict! (2d) is incompatible with (3). One of them must be false.

- Objectives of the talk: I propose that (3) is false, with support from both theoretical and empirical considerations.

- Roadmap:
 - A review of previous treatments of delayed syntactic operations.
 - Delayed Merge is a consequence of Agree
 - Evidence from focusing adverbs

2. The status of delayed syntactic operations in the literature

2.1 Phrase structure grammar and transformational grammar

(Chomsky 1957)

- Non-local syntactic dependencies are (trivially) allowed:
—Affix hopping:

Structural analysis: $X - Af - v - Y$ Structural change: $X_1 - X_2 - X_3 - X_4 \rightarrow X_1 - X_3 - X_2 \# - X_4$

- Number agreement:

Structural analysis: $X - C - Y$ Structural change: $C \left\{ \begin{array}{l} S \text{ in the context of } NP_{sing} \text{---} \\ \emptyset \text{ in other contexts} \\ past \text{ in any context} \end{array} \right\}$

- Transformational grammar imposes no constraint on locality/cyclicity

2.2 Checking theory (Chomsky 1995)

- Background:

I-to-V lowering: Since there is no constraint on cyclicity in the theory yet, lowering has been proposed to account for English verbal morphology in Emonds (1978) and Pollock (1989).

- Extension condition: However, it seems that cyclicity does need to be imposed in the grammar somehow:

—Extension condition: substitutions always extend their targets:

- (4) a. *John seems it is certain to be here.
b. *Fix John can the car?
c. *How did John wonder what Mary fixed?

- Cyclicity is imposed w.r.t substitution but **not** adjunction:

(5) Which claim [that John_i made] was he_i willing to discuss?

- I-to-V lowering is still ruled-out: since it is an instance of adjunction, it should be allowed in grammar. However, it is not so. According to Chomsky, if I is lowered to V in English, but not in French, they will have different adjunction structures.
- Chomsky's 'lexicalist' solution: No counter-cyclic lowering. V is fully specified with inflectional features in the lexicon, they are checked against the features of I at LF.
- Problems: (i) Why does the Extension Condition only apply w.r.t. substitution? (ii) Why does inflection morphology need to apply before syntax?

2.3 Agree theory (Chomsky 2000 et seq.)

- There is neither V-to-T nor T-to-V movement in *narrow syntax*.
 - Counter-cyclic syntactic operations are still disallowed (see also (4)):
- (6) Properties of the probe/selector must be satisfied before new elements of the lexical subarray are accessed to drive further operations. (repeated from (3))
- However, when Agree is involved, counter-cyclic operations are allowed (Chomsky 2001: 5, 2004: 116):
- (7) a. The simplest principle is that the uninterpretable feature F enters the derivation without values. It is valued by Agree.
 b. This entails that the uninterpretable tense feature on *saw* in *John saw Mary* gets its value after it merges with the object DP and the resultant verbal projection merges with T.
 c. This violates (6) if uninterpretable features are *probes*.
- But why hasn't the conflict be noted before?
- (8) a. If a *probe* is defined as the higher member in an Agree operation, then (6) is not violated even in the case of inflection.
 b. Even if a *probe* is defined as the uninterpretable feature in an Agree operation, the effects of counter-cyclicity are not obvious, since only word-internal process are involved.

3. Delayed-Merge as a consequence of Agree

- I argue that counter-cyclic Merge is indeed allowed in the grammar.
- Reason 1: To give a more precise definition of *probe*, we have to abandon one of the previous confusing definitions, namely (i) *probe* as the higher member of the Agree operation (Chomsky 2000), (ii) *probe* as the activator of Agree (Chomsky 2001).
- Reason 2: If we adopt the second definition, which conflicts with the first definition in the case of inflectional morphology, then (3) must be relaxed.
- Reason 3: In addition to inflectional morphology, there are cases where phrase-level syntactic operations are triggered by ‘delayed’ valuation.

- Proposal and prediction:
 - (9) a. When Agree is involved, counter-cyclic operations are allowed.
 - b. A feature can stay unvalued until a matching interpretable feature is merged that involves other feature operations.
 - c. Valuation can be satisfied by either morphosyntactic or syntactic Merge.

4. Syntactic processes triggered by valuation: focusing adverbs

- The kind of evidence we need to find:
 - (10) In a syntactic configuration K where α bears a feature [*i*F] and β bears a matching feature [*u*F:], α c-commands β .
 - a. Agree between [*i*F] and [*u*F:] triggers the valuation of [*u*F:], which is realized by counter-cyclic Merge of γ to β or a projection of β .
 - b. The merge is a phrase-level syntactic process.
 - c. γ is either extracted from K (Move) or a distinct syntactic object (pure Merge).

- Now let’s examine the syntax of focusing adverbs:

4.1 Some basic syntactic properties

- A focusing adverb’s syntax involves 4 components: the adverb, its focus, its host, and its scope (Jackendoff 1972, Bayer 1996).

- Some components of a focus-sensitive expression:
 - (11)a. The **focus** of a focus-sensitive expression is the expression whose substitution by alternative expressions are relevant for the interpretation of the FSE. (represented with underlines)
 - b. The **host** of a focus-sensitive expression is the syntactic constituent it merges with.
 - c. The **scope** of a focus-sensitive expression is the syntactic domain within which it has the ability to affect the interpretation of other expressions. (represented with corner symbols)

- Some evidence for these components:
 - (12)a. 「John **only** saw Mary」. (John didn't see other people.)
 - b. *「**Only** John saw Mary」.
 - (13)a. 「The president will **even** meet Mary」.
 - b. 「**Even** the president will meet Mary」.
 - (14)a. 「We are requested to study **only** Syntax」.
 - b. We are requested to 「study **only** Syntax」.

→ **Focus** determines the syntactic position of *only* in (12). **Host** determines the position of *even* in (13). **Scope** allows different interpretations in (14).

- Furthermore, focusing adverbs, by definition, have properties of adverbial adjuncts:
 - (15) a. It can co-occur with various syntactic categories.
 - b. It does not select and is not selected.
 - c. Inflectional marking is mostly absent.
 - d. It doesn't block agreement.
 - e. It doesn't project nor change the bar-level of its sister constituent.

4.2 Focusing adverbs are 'inflectional affixes writ large'

If we consider these properties carefully, we see that focusing adverbs are not very different from inflectional affixes.

- *Syntax semantics mismatch*: the fact that an FA is attached in a low position but associated with a higher scope position is an instance of syntax-semantics mismatch. (e.g. *John saw **only** Mary. John saw **probably** only Mary.*)

- *No effect on parts of speech or θ -role status*: when a focusing adverb is attached to a phrase, the resultant constituent keeps the same syntactic category and lexical meaning as the original phrase (e.g. *John saw **only** Mary* vs. *John saw **with** Mary*.)
- *The attachment sites can be phrases*: FAs are well-known to attach to various phrasal constituents (e.g. ***Only** [John's FATHER] knows Mary*. *They smoke [IN the classroom] **even***.)

4.3 Focusing adverbs are triggered by Valuation

- Considering (10) again, we find FAs are indeed instances of delayed-Merge we were looking for.

—*An expression α bearing $[iF]$* : Since an FA has a clausal scope, it naturally has an interpretable categorical feature hosted by a corresponding functional head at the periphery of the clause.

—*An expression β bearing $[uF:]$* : the host (attaching site) and the FA does not have any theta-role relationships with the FA, yet it somehow interacts with its scope position, so a member of the host naturally bears a corresponding uninterpretable feature.

— *α c-commands β* : the host of an FA is typically within its scope.

—*An expression γ that realizes the value of $[uF:]$* : Since an FA does not occur at its scope-periphery position, it can naturally be treated as the *realizer* of the feature valuation.

—*Phrase-level Merge*: the host of an FA is usually a phrase.

- With these correspondences in mind, we can now posit the syntactic derivation for focusing adverbs:

(16) *An Agree analysis of focusing adverbs*

a. (i) X D/v/Aux, etc. \rightarrow X D/v/Aux, etc.
 valued $[iF]$ unvalued $[uF]$ valued $[iF]$ valued $[uF]$

(ii) Goal Condition: The head bearing the goal bears the focus of the probe, unless the former is the Aux or the main verb.

(iii) Directionality: The head bearing $[iF]$ c-commands the head bearing $[uF]$.

b. $[uF]$ selects a phrase $P(uF)$ as a candidate for pied-piping.

☆c. Select a suitable morphosyntactic expression M and merge it to

the edge of P(uF). M realizes the feature valuation of [uF]. The syntactic category of M is A (Adjective/Adverb).

d. An EPP feature at X triggers internal Merge of [M P(uF)] to edge of XP.

e. Direction of merger is determined in the Φ .

- The similarities and differences between inflectional morphology and adverbial syntax

(17) *Derivations of inflectional affixes*

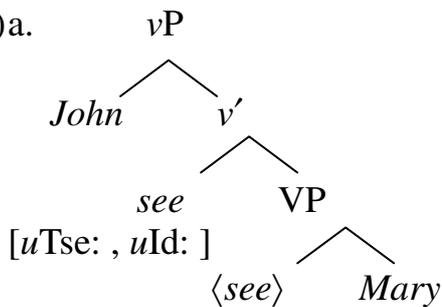
Agree
 Inflect

Derivations of FAs

Agree
 Pied-pipe
 Merge

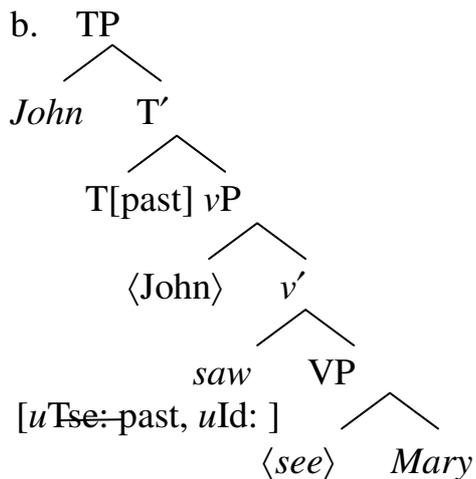
4.4 Deriving the syntax of focusing adverbs

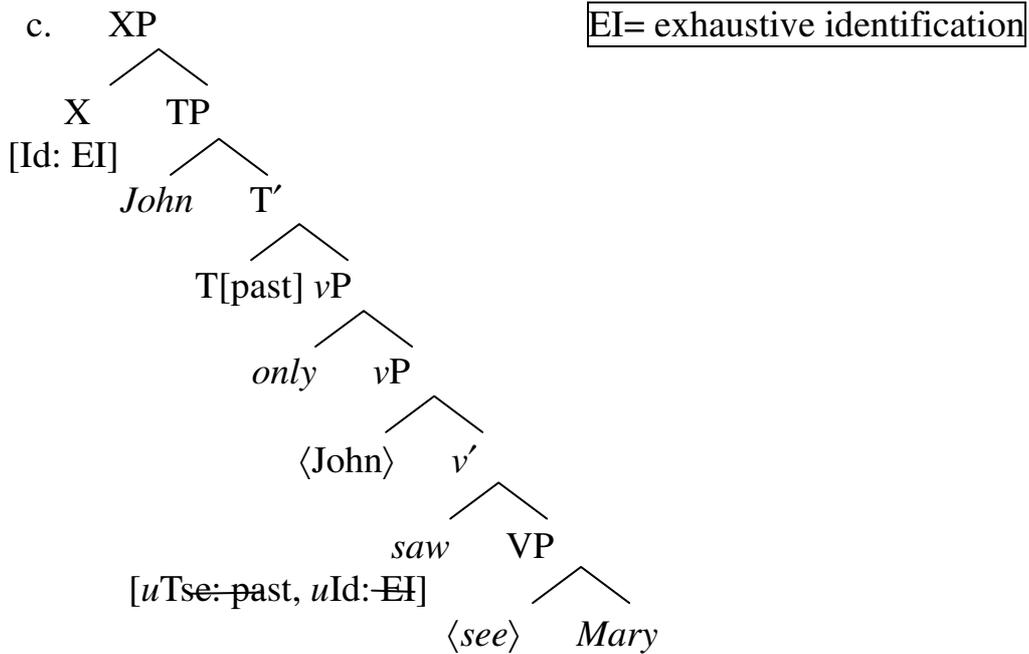
(18)a.



Id= Identification

b.





Note *only* is inserted 'late'

4.5 Some consequences

- *No more mysterious head-movement*

- (19)a. John could **only** have dated MARY. (*only* > *could* ok)
 b. John could have **only** dated MARY. (**only* > *could*)

The contrast in (19) can be accounted for by the locality requirement, which plays a major role in the Agree theory.

(20) *Shortest Agree*: Among possible derivations, the derivation with the shortest distance between the *probe* and the *goal* is preferred than other derivations.

NB: Previous approaches (Bayer 1996, Cinque 1999 etc.) would predict that *only* precedes *could* in (19a).

- *Anti-reconstruction effect*

- (21)a. *Only John will **probably** meet Mary.
 b. **Probably** only John will meet Mary.

(22)a. *只有張三**大概**喜歡李四

b. **大概**只有張三喜歡李四

The contrast in (21) (22) can be accounted for by treating *probably* and *大概* as focusing adverbs, and treating [*only John*] and [只有張三] as their foci. We can derive the results by applying (20).

NB: Bayer (1996) would predict (21a) to be well-formed, because the subject would reconstruct to the vP-internal position.

• *Anti-isomorphism effect:*

(23)a. 只有張三**竟然**不知道這件事

b. **竟然**只有張三不知道這件事

(24)a. 他們都**竟然**不知道這件事

b. 他們**竟然**都不知道這件事

(25) [Who didn't John see?]

He didn't see **probably** only Mary.

These examples show that sentence adverbs *竟然* and *probably* can either precede or follow adverbs with narrower scope. The different word orders can be derived from (16a ii): the focus of the sentence adverb can vary.

• *Anti-periphery effect and a coherent account for sentence adverbs*

(26)a. 張三**竟然/一定**不知道這件事

b. ***竟然**/***一定**張三不知道這件事

- (27)a. Mary **so** aced that physics exam.
 b. ***So** Mary aced that physics exam. (ok with a different meaning)
- (28)a. Mary is **truly** being a fool. (Jackendoff 1972)
 b. ***Truly** Mary is being a fool. (ok with a different meaning)

Although sentence adverbs are taken as a propositional operator, they sometimes cannot occur in the clause-periphery position. This fact can now be accounted for by (16a ii), according to which the main verb is the locus of the *goal* for FAs.

• *An account for connective adverbs*

- (29)a. 你去，我**就**去
 b. 你去，我**才**去

(30) You eat **either** all of the ice-cream, or I punish you.

Connective adverbs can, and sometimes must, occur in a non-periphery position, as shown above. Treating them as focusing adverbs, we can now easily account for their syntactic distributions.

—Evidence that connective adverbs are focus-sensitive:

- (31)a. 你去，**就**會很少人去
 b. 你去，**才**會很少人去

5. Further consequence: the Cyclicity Condition revisited

- Since the effects of the cyclicity requirement are real w.r.t examples in (4), we need to keep it but also revise it.

—*original version*

(32) Properties of the probe/selector must be satisfied before new elements of the lexical subarray are accessed to drive further operations.

—*revised version*

(33) Properties of the selector and the higher member of the Agree operation must be satisfied before new elements of the lexical subarray are accessed to drive further operations.

—The so-called countercyclic Merge is therefore still constrained by principles of grammar.

6. Conclusion

- The Agree framework gives us an opportunity to account for inflectional morphology, syntactic movement, and adverbial syntax in one fell swoop.
- Delayed-Merge is acceptable in grammar just as inflectional morphology is acceptable in grammar.
- Moreover, it is shown that the previous version of the cyclicity condition is too strong and needs to be relaxed.

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Appendix 1:

What is focus?

Definition of focus and focus-sensitivity (cf. Rooth (1985), Krifka (2007), Horvath (2007))

(34) Focus indicates the presence of *alternatives* that are relevant for the interpretation of linguistic expressions.

(35) Semantic operators whose interpretational effects depend on focus are associated with focus.

(36) Prosodic focus is only indirectly related to the syntactically active focus constituent.

- (37)a. John saw [MARY’s son living in Taipei].
b. John saw [Mary’s son LIVING IN TAIPEI].
c. John saw [Mary’s SON living in Taipei].

—The sentences in (37) all involve alternatives which for which the predicate ‘John saw *x*’ could potentially hold.

—The alternative values of the variable in these cases correspond to the whole bracketed DP.

Appendix 2:

Previous studies

1. The clausal head/'minor functional head' analysis (Bayer 1996)

- (i) Focusing adverbs are either clausal heads or 'minor functional heads'.
- (ii) The clausal functional head occupies a position below T^0 .
- (iii) PRT being a *minor functional head* cannot project syntactic categorical features unless it occupies an operator position; in this case, PRT heads the functionally defined phrase PrtP.

(38)a. John will invite only Mary.

b. $[_{IP} \text{John} [_{\Gamma} \text{will} [_{\text{PrtP}} [_{DP} \text{only} [_{DP} \text{Mary}]]]_i [_{\text{Prt}'} \text{Prt}^0 [_{VP} \text{invite } t_i]]]]]]$

Problems:

- (i) It has to stipulate that certain heads do not project.
- (ii) It is unexpected that Prt^0 is lower than T^0 .
- (iii) Unlike all the other heads, Prt^0 has a double identity.
- (iv) Reconstruction problem:

(39) a. Only John will meet Mary.

b. *Only John will **probably** meet Mary.

2 The free adjunction approach (Ernst 2002)

- (i) All adverbs freely adjoin to X's and XPs.
- (ii) The positions of adverbs are determined by semantics.
- (iii) Focusing adverbs tend to be *light*, so they are generally barred from the sentence-initial position.

- Unfortunately, no thorough analysis has been provided for focusing adverbs.

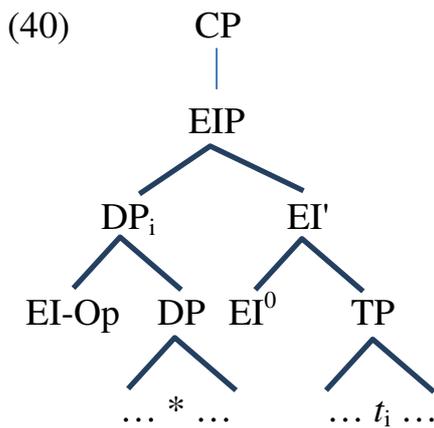
Problems:

- (i) Although it is acknowledged that adjuncts are distinct from non-adjuncts, and some licensing conditions are provided, it is not explained why this is the case.

(ii) There is no semantic analysis of focusing adverbs, hence no syntactic analysis either.

3 Analyses focusing on A'-dependency (Horvath 2007, Wagner 2009)

- (i) 'Focus movement' is triggered by a null EI^0 (EI =exhaustive identification).
- (ii) This EI^0 bears an $[\mu EI]$ feature, an EPP feature, the former enters into a *matching* relation the *goal* in its search domain.
- (iii) The EI operator, which is the focusing particle itself, bears an $[iEI]$ feature. The operator merges with a DP (or a PP, VP, CP). When movement takes place, the phrase containing the operator and its sister phrase is *pied-pied*.
- (iv) The operator requires the presence of stressed-based 'information focus' in its c-command domain.



Problems:

- (i) Although it clarifies the semantic nature of focus movement (relating the movement to EI), it presents a very confused view of the syntactic status of EI^0 and EI -Op.
- (ii) It is unclear what difference is between EI^0 and EI -op besides their syntactic positions; furthermore, it is problematic that EI^0 bears an uninterpretable $[\mu EI]$ feature.
- (iii) More generally, it is not explained how EI -Op is merged in the first place, and why it doesn't project.