On the Syntax of Interface Constraints: Computational Requirements for Focus
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Introduction

- Chomsky’s MP (Chomsky (1995, 2000, 2001) → syntax involves
  1) an operation that join words into phrases (merge)
  2) licensing of those resulting structures by matching their
     features (agree).

- Many formerly syntactic operations → interface phenomena (PF or LF).

- A primary candidate for interface outsourcing is focus:

  Interface properties of focus:

<table>
<thead>
<tr>
<th>LF-effects:</th>
<th>PF-effects:</th>
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<tbody>
<tr>
<td>Focus connects clausal syntax with utterance context properties (new vs. old information)</td>
<td>Focus is a prosodically-marked category in a number of languages.</td>
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- How Syntactic is Focus?

Optimal minimalist account:

1) Focus involves no syntactic computation.
2) LF interface constraints yield mappings to new/old information.
3) PF interface constraints yield prosodic properties of focus (when available).

1. The optimal account

Focus as an interface by-product.

- The syntactic derivation does not treat focused constituents any differently than unfocused phrases.

- Focused constituents undergo merge, agree, etc.

- Focused constituents are spelled out as any other constituent.

- Prosodically motivated word order transformations can occur at this stage, yielding different word orders (see below).

- At PF, some rule assigns clausal stress (to the constituent that will be interpreted as focused).

- At LF, some interpretative rule (perhaps along the lines of Diesing (1992)) partitions the clause into presupposed and non-presupposed domains. If a constituent that receives nuclear stress is not interpreted as non-presupposed (focused), then the derivation cannot be parsed.

1.1 Linearization analyses

- Pereltsvaig (2004) claims that topicalization and focalization are instances of alignment to the right-edge or left-edge of IP in Italian and Russian.

- Focus in Italian is adjoined to the right-edge of IP; material to its right is right-dislocated and adjoined to IP. In (1), tuo fratello ‘your brother’ is focalized, and the other three constituents are right-dislocated.

(1) Ha portato [tuo fratello]$_{FOC}$, il libro, a Giorgio, has brought your brother the book to Giorgio stamattina, this-morning
‘It was your brother who brought the book to Giorgio this morning.’
-The analysis does not require any syntax-specific rules for focus: whatever constituent is present at the right-edge of IP when stress assignment takes place will be interpreted as focused.

-Holmberg (1999) analyzes object scrambling (OS) in Mainland Scandinavian as a stylistic rule triggered by the need of a [-FOC] constituent, the weak pronoun, to scramble out of the VP, which he takes to be the natural domain of non-presupposed information.

-Zubizarreta (1998): two independent principles: clausal-level stress placement (Chomsky and Halle’s (1968) Nuclear Stress Rule) and focus marking, which interact through (2).

(2) **Focus Prosody Correspondence Principle**
   The focused constituent (or F-marked constituent) of a phrase must contain the intonational nucleus of that phrase.

-When the F-marked constituent happens not to be the intonational nucleus of a phrase, then, it must be displaced through what Zubizarreta labels as P(rosodically motivated) movement.

-In (3b), the subject María is focused (it can only be an answer to (3a)). This clause is derived from an underlying VSO word order through leftward adjunction of the lower VP to the higher vP, as in (4).

(3)  
   a. ¿Quién te regaló la botella de vino?  
       who Cl gave the bottle of wine  
       ‘Who gave you the bottle of wine?’
   
   b. Me regaló la botella de vino María  
       Cl gave the bottle of wine María  
       ‘Maria gave me the bottle of wine.’

(4)  

   -After this p-movement, the resulting structure has the subject in the position where nuclear stress is assigned.

   -While Zubizarreta specifically argues that p-movement is a syntactic transformation (it operates on hierarchical structures and requires selection information), it follows the core syntactic computation.

   -By contrast to these interface-oriented analyses, Miyagawa (to appear) proposes that focus-related movement and agreement-related movement are different parameter settings for EPP checking.

   Japanese $\rightarrow$ focus-related EPP
   English $\rightarrow$ agreement-related EPP.

2. **Two types of focus marking in Spanish**

2.1 **Stress marked focus**

-Non-contrastive focus is determined by nuclear stress-assignment (cf. Zubizarreta’s analysis above).

-Non-contrastive, stress-related focus can be given a optimal analysis, since it requires no syntax-specific mechanism.

-Non-contrastive, stress-related focus should be distinguished from contrastive, stress-related focus, which has different properties, and whose
stress pattern is determined by a different mechanism, not the NSR (according to Zubizarreta).

(5) a. ¿Qué te trajo María? what CL brought Maria
   ‘What did Maria bring?’
   b. María me trajo un marco. Maria CL brought a frame
   ‘Maria brought me a frame.’

(6) a. María trajo un libro
   Maria brought a book
   ‘Maria brought a book’
   b. No, María trajo un MARCO. No, Maria brought a frame
   ‘Maria brought a frame.’

-Contrastive focus can be placed on any part of a clause (even sub-parts of a word), it denies a previous statement (in this sense, Zubizarreta calls it metalinguistic).

(7) Es independiente, no dependiente.
   is independent, not dependent
   ‘S/he is independent, not dependent.’

2.2 Focus Copular-Structure

Properties:
- Focus is marked by the copular verb ser ‘be.’
  - By comparison to cleft-focus (8a), the FCS (8b) appears in situ without a Wh-word.

(8) a. Fue el huracán lo que destruyó la casa.
   was the hurricane what destroyed the house
   ‘It was the hurricane that destroyed the house’

b. Destruyó la casa fue el huracán
   destroyed the house was the hurricane
   ‘It was the hurricane that destroyed the house’

- The copular verb can associate with focused constituents of any type: an indirect object PP in (9a), a predicate adjective in (9b), DP-internal NP in (9c).

(9) a. Los bomberos rescataron fue a la abuela.
   the firefighters rescued was to the grandmother
   ‘It was the grandmother the firefighters rescued.’
   b. Mi hermano estaba era triste.
      my brother was was sad
   ‘It was sad that my brother was.’
   c. El presidente de esa época tuvo una fue
      the president of that time had a was
      parálisis.
      paralysis
   ‘It was a paralysis the president at that time had.’

- The copular verb cannot modify preverbal subjects (cf. (10)) and must appear below IP; it cannot modify IP material (cf. (11)-(14)). In (14) the copular verb can appear with an infinitive, but not with the corresponding finite form (cf. (11b), (13b).]

(10) a. Compró papas fue Juan. (Postverbal subject)
    bought potatoes was Juan
    ‘It was Juan who bought potatoes.’
   b. *Fue Juan compró papas. (Preverbal subject)
      was Juan bought potatoes

(11) a. Marta [IP compró [vP papas]]
    Marta bought potatoes
    ‘Marta bought potatoes.’

[1]The distribution of FCS is very similar to that of indeterminate pronouns, which are also focused, cf. Miyagawa(to appear)).
b. *Marta [IP fue compró [vP papas]]
   Marta was bought potatoes

(12) a. Marta [IP no compró [vP papas]] (Negation)
   Marta not bought potatoes
   ‘Marta did not buy potatoes.’
b. *Marta [IP fue no compró [vP papas]]
   Marta was not bought potatoes
c. *Marta [IP no fue compró [IP papas]]
   Marta not was bought potatoes

(13) a. Marta [IP pudo [vP comprar papas]] (Modal)
   Marta could buy potatoes
   ‘Marta could buy potatoes.’
b. *Marta [IP fue pudo [vP comprar papas]]
   Marta was could buy potatoes

(14) a. Marta [IP pudo [vP fue comprar papas]]
   Marta could was buy potatoes
   (Infinite)
   ‘It was buying potatoes that Marta could do.’
b. Marta [IP prometió [vP fue comprar papas]]
   Marta promised was buy potatoes
   ‘It was promising to buy potatoes that Marta could do.’

The FCS copular verb only modifies a vP

- Bosque’s (1999) structure for FCS:

(15) -However, note that the copular verb can appear in what seems to be a VP-internal position, modifying one of the arguments, and leaving others to its right:

(16) Marta le compró [vP pan fue a su abuela] Marta CL bought bread was to her grandmother
   ‘It was her grandmother that Marta bought bread for.’

- Two ways to interpret this data: either Bosque’s analysis needs to be supplemented with further movement of the D.O. pan ‘bread’ to the left (cf. (17), perhaps motivated by the need to have the focused constituent last in the clause (following Zubizarreta).

(17) -Or, there is no fixed position for the copular verb immediately dominating vP, but rather free merge with any constituent up to vP.

- The “upper structural limit” of the vP can be made sense of considering focus’ semantic structure.
-Focus involves a presupposition with a variable, and a clause identifying that variable:

\[(18)\]
\[\begin{array}{ll}
   a. & \text{John bought potatoes} \\
   b. & \text{John bought } x \text{ & the } x \text{ John bought } = \text{ potatoes}
\end{array}\]

-If IP-material is focused (i.e. interpreted as non-presupposed material), there is nothing to map to the presuppositional part of focus interpretation.

-It is possible to focus verbal material, but then a resumptive auxiliary must appear:

\[(19)\]
\[\begin{array}{ll}
   a. & \text{Fue comprar papas lo que hizo Juan. (Cleft) }
   \text{was buy potatoes that did Juan}
   \text{‘It was buying potatoes, that Juan did.’}
   \\
   b. & \text{Fue no comprar papas lo que hizo Juan. }
   \text{was not buy potatoes that did Juan}
   \text{‘It was not buy potatoes, that Juan did.’}
   \\
   c. & \text{Fue poder comprar papas lo que hizo Juan. }
   \text{was can buy potatoes that did Juan}
   \text{‘It was being able to buy potatoes, that Juan was.’}
\end{array}\]

-However, the FCS counterpart of (19) is still ungrammatical ((20a-c) are grammatical if hizo ‘made’ is interpreted as a causative verb):

\[(20)\]
\[\begin{array}{ll}
   a. & \#\text{Juan hizo fue comprar papas. (FCS) }
   \text{Juan did was buy potatoes}
   \\
   b. & \#\text{Juan hizo fue no comprar papas. }
   \text{Juan did was not buy potatoes}
   \\
   c. & \#\text{Juan hizo fue poder comprar papas. }
   \text{Juan did was can buy potatoes}
\end{array}\]

-Under this proposal, the verb would not raise out of VP, the whole lower VP would move to the specifier of CP, leaving the subject stranded in its base, Spec, vP position.

-\textit{Hacer} would appear to host inflection, (as do does in English).

\[(21)\]
\[\begin{array}{ll}
   a. & \text{Juan compró papas.}
   \text{Juan bought potatoes}
   \text{‘Juan bought potatoes.’}
   \\
   b. & \text{Juan no compró papas.}
   \text{Juan not bought potatoes}
   \text{‘Juan did not buy potatoes.’}
   \\
   c. & \text{Juan pudo comprar papas.}
   \text{Juan could buy potatoes}
\end{array}\]

-Further evidence against the analysis in (22) is the fact that in general, in Spanish, hacer-support is not possible in simple clauses, and resumptive verbs are usually possible in ellipsis structures ((23a-b) are good in the causative reading).

\[(23)\]
\[\begin{array}{ll}
   a. & \#\text{¿Qué hizo Juan comprar? }
   \text{what did Juan buy}
   \text{‘What did Juan buy?’}
   \\
   b. & \#\text{Juan HIZO comprar libros. }
   \text{Juan did buy books}
   \text{‘Juan DID buy books’}
\end{array}\]
c. Marta compró un libro y Luis también lo hizo.
   ‘Marta bought a book and Luis also did too.’

2.2.1 Lack of syntactic constraints on the copular verb

As seen in the previous data, the copular verb in FCS is unusual in that it can appear inside the vP, which is usually impossible for non-focus copular verbs.

-Small clauses. Copular verbs are not possible inside small clauses (cf. (24)), although these have been argued to involve some sort of clausal structure.\(^2\) In order for them to appear in such a position, a full clausal structure needs to be projected (cf. (24c)).

(24)
\[
\begin{align*}
\text{a. Considero} & \quad [\text{las matemáticas algo} \ \text{difícil}] \\
& \quad \text{consider the mathematics something difficult} \\
& \quad \text{‘I consider mathematics something difficult’}
\end{align*}
\]

\[
\begin{align*}
\text{b. *Considero} & \quad [\text{las matemáticas ser/son algo} \ \text{difícil}] \\
& \quad \text{consider the mathematics be/are something difficult} \\
& \quad \text{‘I think that mathematics is something difficult’}
\end{align*}
\]

\[
\begin{align*}
\text{c. Considero} & \quad \text{que} \quad [\text{las matemáticas son algo} \ \text{difícil}] \\
& \quad \text{consider that the mathematics are something difficult} \\
& \quad \text{‘I think that mathematics is something difficult’}
\end{align*}
\]

In line with the optimal analysis, the copular verb in FCS is not subject to all the syntactic constraints a verb usually is: the copular verb is not selected nor does it select for any category.

But...

\(^2\)If the copular verb were finite, and the interpretation contrastive, (24b) would become grammatical as an FCS.

The FCS deviates from the optimal analysis in two ways:

1) The copular verb must merge with another constituent.
2) It optionally shows agreement with the focused constituent.

-Merge is presumably necessary for anything that will be linearly processed.

2.3 Agreement patterns with FCS

-Two patterns: default 3p.sg. or full number/person agreement:

(25)
\[
\begin{align*}
\text{a. Llegaron} & \quad \text{fue} \quad \text{ellas.} \\
& \quad \text{arrived.3p.pl} \quad \text{was.3p.sg} \quad \text{they.3p.pl} \\
& \quad \text{‘It was them who arrived.’}
\end{align*}
\]

\[
\begin{align*}
\text{b. Llegaron} & \quad \text{fueron} \quad \text{ellas.} \\
& \quad \text{arrived.3p.pl} \quad \text{were.3p.pl} \quad \text{they.3p.pl} \\
& \quad \text{‘It was them who arrived.’}
\end{align*}
\]

(26)
\[
\begin{align*}
\text{a. Compré} & \quad \text{fue} \quad \text{papas.} \\
& \quad \text{bought.1p.sg} \quad \text{was.3p.sg} \quad \text{potatoes.3p.pl} \\
& \quad \text{‘It was potatoes they bought.’}
\end{align*}
\]

\[
\begin{align*}
\text{b. Compré} & \quad \text{fueron} \quad \text{papas.} \\
& \quad \text{bought.1p.sg} \quad \text{were.3p.pl} \quad \text{potatoes.3p.pl} \\
& \quad \text{‘It was potatoes they bought.’}
\end{align*}
\]

-Temporal features match the main verb’s:

(27)
\[
\begin{align*}
\text{a. *Llegaron} & \quad \text{es} \quad \text{ellas.} \\
& \quad \text{arrived.3p.pl} \quad \text{is.3p.sg} \quad \text{they.3p.pl} \\
\end{align*}
\]

\[
\begin{align*}
\text{b. *Compré} & \quad \text{son} \quad \text{papas.} \\
& \quad \text{bought.1p.sg} \quad \text{are.3p.pl} \quad \text{potatoes.3p.pl} \\
& \quad \text{‘It was potatoes they bought.’}
\end{align*}
\]

-(25)-(27) suggest that the copular verb optionally enters into agreement (checking) relations with the focused constituent.

Questions:

1) Why can the copular verb agree?
2) Does this represent some principled deviation from the optimal analysis?
3. FCS and the optimal analysis

The assumption that (25)-(26) is a principled, minimal deviation from the optimal analysis predicts the observed patterns.

Assumptions

(28) Maximize agreement: Morpheme values on two agreeing categories should be similar as possible.

(29) i. Languages parametrize whether or not verbs appear with overt morphology and what type of morphology.
   ii. Verbs in Spanish require overt marking of person, number and tense.

(30) Merge and agree operate only on categorial labels.

(28) insures that morphological settings on a subject and verb, for example, match, when they agree. This principle is constrained by the type of morphological paradigm a given language has, as stated in (29).

(30) claims that merge and agree operate only on word-classes. By virtue of being a member of a class, an individual lexical item will be required to have show whatever features the whole class has.

As seen, the copular verb ser ‘be’ can have two settings, one which triggers full agreement, the other one with default agreement, as in (31).

The full agreeing pattern (cf. (25b) above), will have the representation in (32). This pattern is the result of (28)-(30), namely, by virtue of being part of the V-class, the copular verb must have morphological features that mirror syntactic agreement, hence fueron.

(31) a. Full agreement setting: fueron (3p.pl., past)
   b. Default setting: fue (3p.sg., past)

(32) llegaron fueron ellas

Formally, the uninterpretable features on copular fue probe, agree with interpretable φ-features on the DP, and delete.

The uninterpretable features on main verb llegaron also probe, agree with interpretable φ-features on the DP, and delete.

Since the tense feature is interpretable (on both verbs) need not be checked.

3.1 Default agreement

(25a), the default setting case, raises the question of how to formally treat default agreement. For the time being, let us assume (33).

(33) i. Default settings are syntactically active agreement features.
   ii. The verb agrees with a 3p.sg. null expletive.

(34) llegaron pro fue ellas

The two cases illustrated in (25) (full and default agreement) would be akin to the there-insertion examples in (35): one with an expletive ((25a) and (35a)) and one with a fully agreeing subject ((25b) and (35b) respectively).

(35) a. There arrived a person in the room.
   b. A person arrived in the room.

Two main differences between raising verbs and FCS: 1) FCS has an additional, overt agreeing head (the copular verb), and 2) in the full-agreement variant, it does not require the subject to raise to the Spec of the agreeing category, unlike English raising verbs.
3.2 Why do we have alternations of fully-agreement and default agreement? An alternative

One possible answer to this question leads to an alternative analysis:

Default agreement cases do not involve syntactic computations hence, they are closer to the optimal analysis.

-If default settings involve no $\phi$-features (contrary to assumption (33i)), then no syntactic computation takes place between the verb and the DP.

-Naturally, merge is still necessary.

-If no $\phi$-features are present, there is no need to postulate a null expletive (contrary to assumption (33ii)).

-Why is the full-agreement alternative available?

3.2.1 Default agreement and categorial change

Two intuitions:

1) Default settings reflect rules on word classes

| Full agreement reflects rules that operate on individual lexical items |

2) Default settings are a pre-requisite for categorial neutralization

(36) The more a verb deviates from the syntax of its category, the more likely it is it will have default agreement.

Two examples:

1) Raising verb parecer ‘seem’ in Spanish.

2) The ‘hearsay’ adverb dizque in Latin American Spanish.

3.2.2 Raising verbs

-Raising verbs agree with a raised verb (cf. (37a)). Even when there is no overt agreement, the raising verb can vary in tense (cf. (37c)).

(37) a. Ellos parecen contentos.
    they seem.pl happy.pl
    ‘They seem happy’

    b. Parece que están contentos.
    seems.3p.sg. that are happy
    ‘It seems they are happy.’

    c. ‘Parecía que estaban contentos.
    seemed.3p.sg. that were happy
    ‘It seemed they were happy.’

-When the raising verb is used as a parenthetical, however, it is frozen in the present:

(38) a. Se podrían, parece, los tomates.
    cl. rotted seems the tomatoes
    ‘It seems it was the tomatoes that were rotted.’

    b. ??Se podrían, parecía, los tomates.
    cl. rotted seem.PAST the tomatoes

    c. *Se podrían, parecen, los tomates.
    cl. rotted, seem.3p.pl.PRES the tomatoes

3.2.3 ‘Hearsay’ dizque

In Latin American Spanish, the Old Spanish 3p.sg. form of the verb decir ‘say,’ diz has become fossilized in Latin American Spanish with the meaning of ‘hearsay.’ It is attached to the complementizer que, forming dizque:

(39) a. Dizque Pedro se gastó toda la plata.
    cl. say Pedro cl. spent all the money
    ‘Apparantly, Pedro spent all the money.’

    b. *Dicesque Pedro se gastó toda la plata.
    say.2p.that Pedro cl. spent all the money

    c. *Decíaque Pedro se gastó toda la plata.
    say.3p.PAST.that Pedro cl. spent all the money
Diz was the default form in Old Spanish, and it acquired the additional point-of-view meaning ‘hearsay.’

In its contemporary use, dizque no longer has φ or temporal features and it has none of the distributional properties of a verb.

Default agreement may be the first and necessary step in changing categorial status from V. Clearly FCS ser has not reached that stage yet: default φ-features are still compatible with past tense.

### 3.3 On the full/default agreement alternation

If default agreement is closer to the optimal situation, why is full agreement available?

If default settings are a way in which individual words can suspend categorial value, the two patterns represent two different ways of building a derivation:

- **Full-agreement** reflects rule application over word classes (individual words receive a value by being members of the class).
- **Default-agreement** reflects rule application to individual words (potentially competing with the word-class rule).

Computationally, full-agreement is costlier (it involves overt checking), but as a rule it is more efficient because it applies to a whole word class.

The two patterns may coexist (at least temporarily), because they apply in two different ways: one applies to a whole class, another one to a single lexical item.

### 3.4 The copular verb and focus

Why is the copular verb used to mark focus?

If the informal interpretation of focus given in (18b) (repeated below) is correct, the fact that the copular verb is used is not a coincidence: the syntax of FCS maps directly to LF (cf. (40)), with the copular verb corresponding to the equative predicate in the LF form.

(18)  
\begin{align*}
\text{b. John bought } x \& \text{ the } x \text{ John bought } &= \text{ potatoes} \\
\end{align*}

(40)  
\begin{align*}
\text{a. Juan compró fue papas} \\
\text{Juan bought was potatoes} \\
\text{‘It was potatoes that Juan bought.’} \\
\text{b. Juan bought } x \& \text{ the } x \text{ John bought } &= \text{ potatoes}
\end{align*}

### 4. Recapitulation

Both the full and default agreement paradigms reflect a minimal deviation from the optimal analysis:

1) The copular verb is subject to minimal syntactic requirements: merge and, in one of the patterns, agree (but no selectional requirements).

2) Full agreement minimally deviates from the optimal analysis because it is the result of inserting a lexical item belonging to a word class. By necessity, it will come with φ-features.

3) Default agreement, on the other hand, requires no agreement, hence, only merge.

4) Every other constraint is interface-related.

### References


