Duplication of *Wh*-elements in Brazilian Sign Language

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1.   Introduction[1]

This paper discusses constructions involving duplication of *wh*-elements under emphatic focus (*E-focus*) in Brazilian Sign Language (*LSB*), as illustrated in (1) below.[2] Based on Nunes's (1999, 2004) proposal that deletion of copies is triggered by linearization considerations and Nunes and Quadros's (2004) analysis of E-focus duplication in LSB and American Sign Language (*ASL*), we argue that constructions such as the ones in (1) involve adjunction of the *wh*-element to an E-focus head and phonetic realization of more than one link of the *wh*-chain.[3]

(1)   a. [JOHN SEE WHO YESTERDAY]$_{wh}$ [WHO]$_{wh}$
         b. [WHO JOHN SEE YESTERDAY]$_{wh}$ [WHO]$_{wh}$
            'Who exactly did John see yesterday?'

        The paper is organized as follows. In section 2, we present Nunes and Quadros's (2004) analysis of E-focus duplication of non-*wh*-elements in LSB and ASL. In section 3, we show that this analysis can be straightforwardly extended to duplication of *wh*-elements in LSB when the *wh*-element appears *in situ* (cf. (1a)), but apparently not when the *wh*-element undergoes movement to the left periphery (cf. (1b)). More specifically, it

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[2] In the examples that follow, indices following a closing bracket annotate the type of nonmanual marking associated with the structure (*hn*: head nod; *r*: relative clause; *wh*: matrix question; and *wh~*: embedded question) and the brackets mark its scope; a lower case subscript on a sign indicates spatial location; and superscripted indices annotate copies produced by movement operations.

[3] All the judgments regarding E-focus duplication reported below refer to sentences where there is no significant pause preceding the duplicated element in the final position. When there is such a pause, it is very likely that a completely different analysis is required, for the doubled element may simply be a discourse fragment that does not belong to the previous sentence (see Petronio and Lillo-Martin 1997 for relevant discussion).

seems that Nunes and Quadros's (2004) analysis incorrectly predicts that acceptable sentences such as (1b) should be ruled out as a violation of (updated versions of) Ross's (1967) Left Branch Condition or Huang's (1982) CED. Section 4 shows that the problem is only apparent and that *wh*-duplication constructions involving standard *wh*-movement are derived via excorporation of the *wh*-element adjoined to the E-focus head. Evidence for this proposal is then presented in section 5, where we discuss cases involving the interaction between *wh*-movement and duplication of elements other than the *wh*-element. Finally, some concluding remarks are presented in section 6.[4]

2.   Nunes and Quadros's (2004) Analysis of E-focus Duplication in LSB

Both ASL (see Petronio 1993 and Petronio and Lillo-Martin 1997, among others) and LSB (see Quadros 1999) allow constructions where a focalized element appears duplicated at the right edge of the sentence, as illustrated in (2) below.[5] Examining several types of focus constructions in ASL and LSB, Lillo-Martin and Quadros (2004) show that constructions such as (2) are used to confirm or disconfirm previous statements in the discourse situation and, following Zubizarreta (1998), they refer to this type of focus as emphatic focus (*E-focus*).[6]

(2)   a. [ANN LIKE ICE-CREAM LIKE]$_{hn}$ (*ASL*)
          'Ann LIKES ice-cream.'
       b. I LOSE BOOK [LOSE]$_{hn}$ (*LSB*)
          'I LOST the book.'

As originally observed by Petronio (1993) for ASL and later also attested in LSB by Quadros (1999), E-focus duplication constructions exhibit two interesting properties. First, the relationship between the identical elements is subject to island effects, as illustrated in (3) below, where the relative clause dominates the sentence-internal, but not the sentence-final element. And second, duplication may involve heads, as see in (2), but not phrases, as shown in (4).[7]

(3)   a. *[WOMAN WILL COME TOMORROW]$_r$ NAME S-U-E WILL   (*ASL*)
          'The woman that WILL come tomorrow is called Sue.'

       b. *GIRL [[BICYCLE FALL]$_r$ IS HOSPITAL [FALL]$_{hn}$]$_{focus}$ (*LSB*)

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[4] Superficial differences aside, the analysis of *wh*-duplication to be developed below for LSB can arguably be extended to ASL, as well. We will however focus our attention only on LSB, leaving a detailed comparison between the two languages for another occasion.

[5] The doublet in the clause-internal position is actually optional in both languages. Due to space limitations, here we will only discuss the version of these constructions with duplication. For a linearization-based analysis of the version without duplication, see Nunes 2003, 2004 and Nunes and Quadros 2004.

[6] All the ASL data cited below are from Petronio 1993.

[7] In fact, the opposition heads *vs.* phrases is just an instance of the general opposition morphologically simple *vs.* morphologically complex. Thus, in LSB uninflected verbs can be duplicated, but verbs inflected for agreement morphology cannot (see Nunes 2003, 2004 and Nunes and Quadros 2004 for relevant discussion).

'The girl that FELL from the bicycle is in the hospital.'

(4)   a. *[ANN WANT LEAVE WANT LEAVE]hn   (*ASL*)
           'Ann WANTS to leave.'
       b. *JOHN BUY CAR YESTERDAY [BUY CAR]hn   (*LSB*)
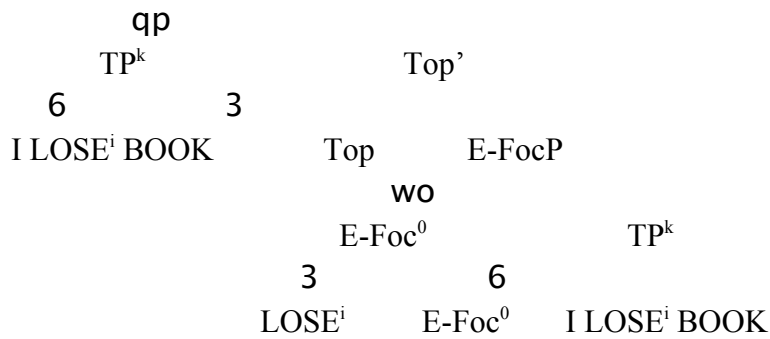   'Yesterday, John BOUGHT a car.'

        Nunes and Quadros (2004) provide an account of the paradigm above within the copy theory of movement by relying on Nunes's (1999, 2004) proposal that deletion of copies is triggered by linearization considerations. According to this proposal, the links of a given chain count as nondistinct for purposes of linerarization due to the fact that they refer to the same lexical elements in the numeration that feeds a derivation. That being so, a structure containing a chain (that is, nondistinct copies) cannot be linearized in the phonological component, because the LCA (see Kayne 1994) would be required to assign different positions to the "same" element. Structures containing chains can however be linearized in compliance with the LCA if the lower copies of the chains are deleted (see Nunes's 1999, 2004 Chain Reduction operation).[8] Assuming with Chomsky (1995) that the LCA does not apply word-internally, Nunes (2004) further proposes that if a given copy gets morphologically reanalyzed as part of a given terminal (i.e. if it undergoes morphological fusion in the sense of Halle and Marantz 1993), it will be become invisible to the LCA and will not be subject to deletion by Chain Reduction. Its linearization will be indirectly determined by the position assigned by the LCA to the terminal containing it. In other words, if a given copy undergoes fusion, it will behave like the morphemes or phonemes of a particular word, which are not directly manipulated by the LCA but indirectly get assigned a position in the surface string once the LCA assigns a position to the word containing them.

        Nunes and Quadros (2004) argue that such morphological reanalysis affecting a copy is indeed what underlies E-focus duplication constructions in ASL and LSB. According to them, a sentence such as (2b) in LSB, for example, is derived along the lines of (5) below. Assuming with Lillo-Martin and Quadros (2004) that in ASL and LSB, a projection of an E-focus head dominates TP and is dominated by a projection of a topic head (TopP), the focalized verb in (5a) moves and adjoins to the E-Foc head, leaving a copy behind. TP then undergoes remnant movement to [Spec, TopP], also leaving a copy behind, as shown in (5b).

(5)   a. [E-FocP LOSE^i+E-Foc [TP I LOSE^i BOOK]]

       b.   TopP

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[8] To be precise, deletion of all but one chain link is what is required to allow the proper linearization of a structure containing chains with all of their links visible to the LCA (see Nunes 2004). This does not mean that the link to escape deletion must necessarily be the head of the chain. It is just the general case. If phonetic realization of the head of the chain causes the derivation to crash, a lower copy (a "trace") must be phonetically realized, instead. See Bošković 2001, Nunes 2004, and Bošković and Nunes 2004, among others, for actual cases of lower copy pronunciation and relevant discussion.

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                    qp
         TPᵏ                        Top'
       6            3
     I LOSEⁱ BOOK         Top        E-FocP
                              wo
                      E-Foc⁰                TPᵏ
                     3              6
                 LOSEⁱ      E-Foc⁰     I LOSEⁱ BOOK
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After (5b) is spelled out, *LOSE* and E-foc fuse in the morphological component, rendering the fused copy invisible to the LCA, as represented in (6) ("#" annotates fusion and the shaded area marks material that is invisible to the LCA).

(6)   [$_{TopP}$ [$_{TP}$ I LOSEⁱ BOOK]ᵏ [$_{Top'}$ Top [$_{E-FocP}$ #LOSEⁱ+E-Foc# [$_{TP}$ I LOSEⁱ BOOK]ᵏ]]]

In order for the structure in (6) to be linearized, Chain Reduction applies to the TP chain in (6), deleting its lower link and yielding (7) below, which ends up surfacing as (2b). Crucially, the realization of the two copies of *LOSE* in (7) does *not* create linearization problems, because the LCA takes *#LOSE+E-Foc#* as an atomic terminal element and does not look inside it. In other words, the fused copy is disregarded by the LCA and is assigned a position in the surface string as a by-product of the linearization of the composed terminal *#LOSE+E-Foc#*.

(7)   [$_{TopP}$ [$_{TP}$ I LOSEⁱ BOOK]ᵏ [$_{Top'}$ Top [$_{E-FocP}$ #LOSEⁱ+E-Foc# [$_{TP}$ I LOSEⁱ BOOK]ᵏ]]]

Under this analysis, the island effects displayed by E-focus duplication constructions (cf. (3)) are not at all surprising. Given that the focused element in the right edge of the sentence reaches this position through movement, such movement should be subject to island constraints. In turn, phrases (and morphologically complex elements; see fn. 7) cannot be duplicated (cf. (4)) arguably because they cannot undergo morphological fusion due their morphological "heaviness", even if they were able to undergo a derivation along the lines of (5). Once fusion cannot apply between E-Foc and *WANT LEAVE* in (4a) or between E-Foc and *BUY CAR* in (4b), for example, the two copies of the focused material remain visible to the LCA. Hence, the attempted derivations of the sentences in (4) crash because the relevant structures cannot be linearized, for the same element would be required to be mapped into two distinct linear positions.

Assuming that this general analysis of E-focus duplication in ASL and LSB is essentially correct, let us now examine how it fares when duplication of *wh*-elements in LSB is concerned.

3.   *Wh*-constructions and E-focus Duplication

Nunes and Quadros's (2004) analysis reviewed in section 2 can be extended to duplication of *wh*-elements such as the ones illustrated in (8) straightforwardly.

(8)   a. [JOHN SEE WHO YESTERDAY]$_{wh}$ [WHO]$_{wh}$
      'Who exactly did John see yesterday?'
      b. [JOHN BUY WHAT YESTERDAY]$_{wh}$ [WHAT]$_{wh}$
      'What exactly did John buy yesterday?'

In the derivation of (8a), for instance, *WHO* first adjoins to the E-focus head, leaving a copy behind, as shown in (9a), followed by remnant movement of the whole TP, as shown in (9b). In the morphological component, *WHO* and E-focus fuse, as shown in (9c), rendering the adjoined copy invisible to the LCA and, therefore, immune to Chain Reduction. After the lower copy of TP is deleted, as shown in (9d), the sentence in (8a) is finally derived.

(9)   a. [$_{E\text{-FocP}}$ WHO^i+E-Foc [$_{TP}$ JOHN SEE WHO^i YESTERDAY]]
      b. [$_{TopP}$ [$_{TP}$ JOHN SEE WHO^i YESTERDAY]^k [$_{Top'}$ Top [$_{E\text{-FocP}}$ WHO^i+E-Foc
      [$_{TP}$ JOHN SEE WHO^i YESTERDAY]^k]]
      c. [$_{TopP}$ [$_{TP}$ JOHN SEE WHO^i YESTERDAY]^k [$_{Top'}$ Top [$_{E\text{-FocP}}$ #WHO^i+E-Foc#
      [$_{TP}$ JOHN SEE WHO^i YESTERDAY]^k]]]
      d. [$_{TopP}$ [$_{TP}$ JOHN SEE WHO^i YESTERDAY]^k [$_{Top'}$ Top [$_{E\text{-FocP}}$ #WHO^i+E-Foc#
      [~~$_{TP}$ JOHN SEE WHO^i YESTERDAY]^k~~]]]

As we should expect, duplication of *wh*-elements under E-focus in LSB also displays island effects, as illustrated in (10).

(10)   a. YOU TALK MAN$_a$ [IX$_a$ CONVIDAR WHO GO$_b$ PARTY$_b$ MARY$_b$]$_r$
      'Who$_i$ did you talk to the man that invited him$_i$ to go to Mary's party?'
      b. YOU TALK MAN$_a$ [IX$_a$ CONVIDAR WHO GO$_b$ PARTY$_b$ MARY$_b$
      [WHO]$_{focus}$]$_r$
      c. *YOU TALK MAN$_a$ [IX$_a$ CONVIDAR WHO GO$_b$ PARTY$_b$ MARY$_b$]$_r$
      [WHO]$_{focus}$
      'Who$_i$ exactly did you talk to the man that invited him$_i$ to go to Mary's party?'

(10) shows that a *wh-in situ* inside a relative clause is allowed and that it can even be duplicated as long as it remains *inside* the scope of the relative clause. According to the analysis sketched above, the unacceptability of (10c) is to be attributed to the crossing of the relative clause by the *wh*-element on its way to the position associated with E-focus in the matrix clause.[9]

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[9] One could think that the unacceptability of (10c) can also be accounted for in terms of minimality, if *WHO* skips the E-Focus projection associated with the relative clause, which is present in (10b). Although LSB does allow one E-focus projection per clause, these projections are optional. Thus, in the absence of islands, a focused element of an embedded clause can in fact and adjoin to the E-focus head associated with the matrix clause, as shown in (i).
(i)   JOHN$_a$ $_a$TELL$_1$ MARY PROMISE PETER$_b$ WILL $_b$INVITE$_1$ PARTY [PROMISE]$_{hn}$
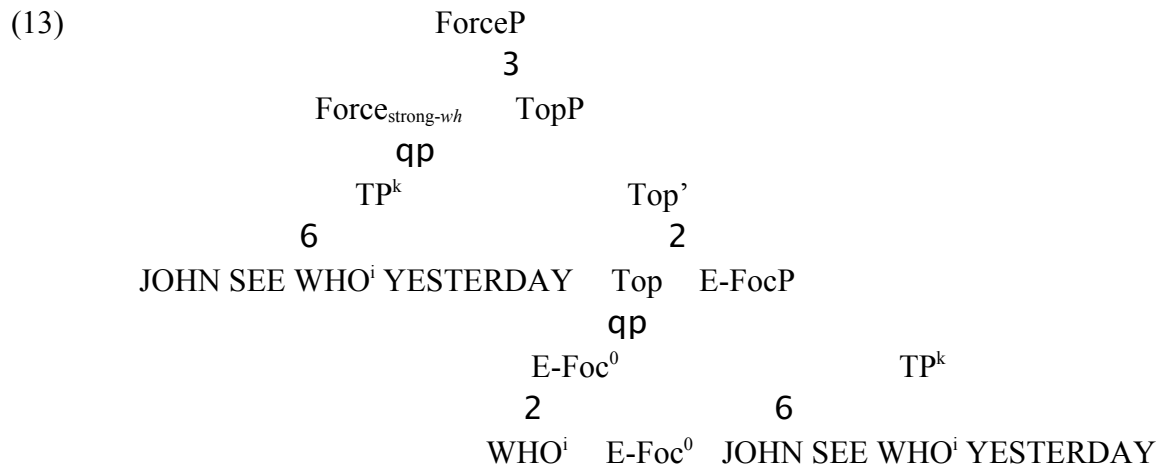
We also find here the same type of morphological complexity restrictions seen in section 2 (cf. (4)). As exemplified in (11) below, duplication of *wh*-words is permitted, but duplication of *wh*-phrases is not. This can arguably be attributed to the lack of fusion between the *wh*-phrase and E-focus. In other words, the two copies of the *wh*-phrase in (11b) are visible to the LCA and the structure containing these nondistinct copies cannot be linearized.

(11)   a. [JOHN BUY WHICH BOOK YESTERDAY]$_{wh}$ [WHICH]$_{wh}$
        b. *[JOHN BUY WHICH BOOK YESTERDAY]$_{wh}$ [WHICH BOOK]$_{wh}$
           'Which book exactly did John buy yesterday?'

A potential problem arises when *wh*-duplication constructions also involve standard *wh*-movement to the left periphery, as illustrated in (12).

(12)   a. [WHO JOHN SEE YESTERDAY]$_{wh}$ [WHO]$_{wh}$
           'Who exactly did John see yesterday?'
        b. [WHAT JOHN BUY YESTERDAY]$_{wh}$ [WHAT]$_{wh}$
           'What exactly did John buy yesterday?'

(12a), for instance, arguably shares the same derivational history involved in the derivation of (8) up to (9b). After this step, an additional head with a strong *wh*-feature, say Rizzi's (1997) Force, is introduced into the derivation, as shown in (13) below, which should then overt *wh*-movement..

(13)   ForceP
                                   3
            Force$_{strong-wh}$ TopP
                      qp
                 TP^k Top'
               6   2
       JOHN SEE WHO^i YESTERDAY   Top   E-FocP
                                              qp
                               E-Foc^0 TP^k
                                  2   6
                             WHO^i E-Foc^0 JOHN SEE WHO^i YESTERDAY

The problem with (13) is that there does not seem to be a source for the required movement to check the strong *wh*-feature of Force. Such movement should not be launched from within the copy of TP that occupies [Spec, E-FocP], as this should give rise to a violation of (updated versions of) Ross's (1967) Left Branch Condition or Huang's (1982) CED. Notice furthermore that the *wh*-movement to [Spec, ForceP] cannot be launched from within the lower copy of TP, due to the intervening copy of *WHO* adjoined to E-Foc, which c-commands into the lower copy of TP. In fact, even in

'John told me that Mary did promise that Peter will invite me to the party.'

the absence of an intervening element, there are actually reasons to believe that the copy of *WHO* inside the lower copy of TP in (13) should not be accessible to the computation.

Take the derivation of the English sentence in (14) below, for instance, and consider the derivational step prior to *wh*-movement, as illustrated in (15). Movement of *who* from the [Spec, TP] violates the Left Branch Condition or the CED, correctly accounting for the unacceptability of (14). But in order for the analysis to go through, it must be assumed that the copy of *who* within the lower copy of *[a picture of who]* is not accessible to the computational system; otherwise, *wh*-movement could proceed from this position and (14) would incorrectly be ruled in.[10] These considerations should also preclude the possibility of movement of *WHO* from within the lower copy of (TP) in (13). In other words, Nunes and Quadros's (2004) analysis appears to predict that constructions involving both *wh*-duplication and *wh*-movement such as (12a) should be unacceptable, contrary to fact.

(14)   *Who was a picture of taken?

(15)   [$_{ForceP}$ Force [$_{TP}$ [a picture of who]^i [$_{T'}$ was [$_{VP}$ taken [a picture of who]^i]]]]

One could think that movement of *WHO* from within [Spec, TopP] in (13) is allowed because *WHO* is θ-marked. In other words, whatever accounts for the fact the θ-marked traces do not violate the ECP could in principle account for the acceptability of constructions such as (12). We need not attempt to properly substantiate this suggestion in a minimalist setting, for as we can see in (16) below, not only arguments, but also adjuncts can be duplicated and move to the left periphery. This strongly indicates that on its way to [Spec, ForceP], the *wh*-element must not be crossing any island at all.

(16)   a. [HOW JOHN SOLVE PROBLEM]$_{wh}$ [HOW]$_{wh}$
             'How exactly did John solve the problem?'
        b. [WHY JOHN LEAVE]$_{wh}$ [WHY]$_{wh}$
             'Why exactly did John leave?'

Finally, there is still an additional puzzle. Although in E-focus duplication with *wh*-in situ, the *wh*-trace can be phonetically realized, as seen above in (8), this is not allowed when leftward *wh*-movement is also involved, as shown in (17).

(17)   a. *[WHO JOHN SEE WHO YESTERDAY]$_{wh}$ [WHO]$_{wh}$
             'Who exactly did John see yesterday?'
        b. *[WHAT JOHN BUY WHAT YESTERDAY]$_{wh}$ [WHAT]$_{wh}$
             'What exactly did John buy yesterday?'

Let us see how these puzzles can be handled.

4.   *Wh*-duplication and *Wh*-excorporation

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[10] For an LCA/multiple Spell-Out account of the reason why the material within copies left by movement is inaccessible to the computation, see Nunes and Uriagereka 2000.

The discussion above did not examine all the potential derivations that could yield constructions involving both *wh*-duplication and leftward *wh*-movement. Although *wh*-movement could not have been launched from within either of the copies of TP in (13), for instance, the copy of *WHO* adjoined to E-Foc is accessible to the computational system. It could then move to the [Spec, ForceP] to check the strong *wh*-feature of Force without creating any problems, yielding the structure in (18) (with numbered copies for ease of reference).

(18)
```
                        ForceP
                      3
            WHO⁴          Force'
                      3
              Force          TopP
                 qp
             TPᵏ                    Top'
            6                        2
    JOHN SEE WHO³ YESTERDAY    Top    E-FocP
                                      qp
                            E-Foc⁰                TPᵏ
                            2                    6
                        WHO²  E-Foc⁰   JOHN SEE WHO¹ YESTERDAY
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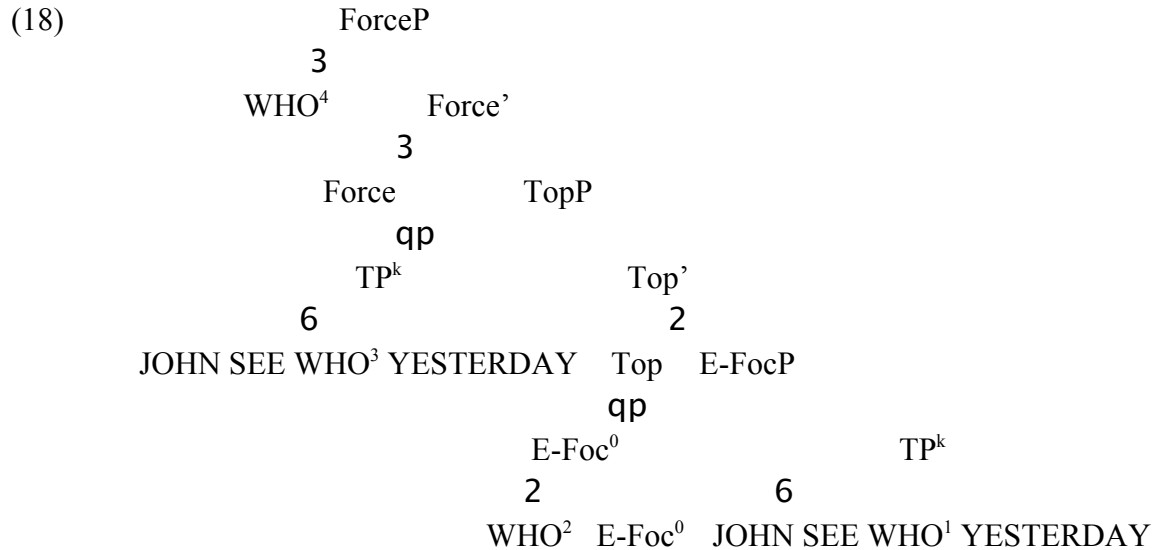
Notice that as a minimal maximal projection (see Chomsky 1995), *WHO* could in principle undergo either head movement or phrasal movement. In the constructions under discussion, it exploits both possibilities, first undergoing head movement to E-Foc and then phrasal movement to [Spec, ForceP].

After the structure (18) is formed, a kind of parasitic gap construction is obtained with WHO⁴ being able to form two "forking" chains: $CH_1 = (WHO^4, WHO^2, WHO^1)$ and $CH_2 = (WHO^4, WHO^3)$. (18) will only be able to be linearized after Chain Reduction applies to each of these chains (in addition to the TP chain). But before linearization takes place, *WHO²* and E-Foc fuse in the morphological component, as shown in (19), rendering *WHO²* invisible to the LCA and, consequently, to deletion by Chain Reduction.

(19)   [ForceP WHO⁴ [Force' Force [TopP [TP JOHN SEE WHO³ YESTERDAY]ᵏ
        [Top' Top [E-FocP #WHO²+E-Foc# [TP JOHN SEE WHO¹ YESTERDAY]ᵏ]]]]]

Applying to CH_1, Chain Reduction then ignores *WHO²* and just deletes the lowest *wh*-copy, yielding (20a) below. Further applications of Chain Reduction to CH_2 and to the TP chain also delete the lower link of each chain, as respectively shown in (20b) and (20c), which finally surfaces as (8a).[11]

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[11] Any order of application of Chain Reduction to the three chains in (19) yields the same result.

(20)   a. [ForceP WHO^4 [Force' Force [TopP [TP JOHN SEE WHO^3 YESTERDAY]^k
         [Top' Top [E-FocP #WHO^2+E-Foc# [TP JOHN SEE ~~WHO^1~~ YESTERDAY]^k]]]]]
       b. [ForceP WHO^4 [Force' Force [TopP [TP JOHN SEE ~~WHO^3~~ YESTERDAY]^k
         [Top' Top [E-FocP #WHO^2+E-Foc# [TP JOHN SEE ~~WHO^1~~ YESTERDAY]^k]]]]]
       c. [ForceP WHO^4 [Force' Force [TopP [TP JOHN SEE ~~WHO^3~~ YESTERDAY]^k
         [Top' Top [E-FocP #WHO^2+E-Foc# ~~[TP JOHN SEE WHO^1 YESTERDAY]^k~~]]]]]

We now have an explanation for why a *wh*-copy may appear "*in situ*" under simple duplication, as seen in (8), but not under duplication with *wh*-movement, as seen in (17). The derivation of (17a), for instance, should be like the one just discussed, with the only difference being that CH$_2$ = (WHO^4, WHO^3) has not been reduced. Given that the two links of this chain are visible to the LCA, if it does not undergo Chain Reduction, the derivation crashes because the structure cannot be linearized. In other words, the unacceptability of the sentences in (17) is to be reduced to the unacceptable sentences in (21), which involve standard *wh*-movement without deletion of the lower copies.

(21)   a. *[WHO JOHN SEE WHO YESTERDAY]$_{wh}$
         'Who did John see yesterday?'
       b. *[WHAT JOHN BUY WHAT YESTERDAY]$_{wh}$
         'What did John buy yesterday?'

Contrary to what may seem at first glance, the proposal that sentences such as (12) and (16) are derived through excorporation of the *wh*-element adjoined to E-Foc is even compatible with the standard *GB* account of the ban on excorporation, due to Baker (1988). According to this account, movement of X^0 from the adjunction structure [Y0 X^0 [Y0 Y^0]] would feed the morphological component with a head with a trace adjoined to it and this was taken to be an illicit morphological object. If we were to reinterpret this account in terms of the copy theory of movement, we could assume that deletion of copies cannot take place under an X^0 element. Notice, however, that it is a crucial feature of our proposal that the *wh*-copy adjoined to E-Foc does *not* delete. After the *wh*-copy and E-Foc undergo fusion in the morphological component in (19), for instance, the *wh*-copy becomes invisible to the LCA and, therefore, it is not deleted by Chain Reduction.

To summarize, *wh*-duplication with *wh*-movement does not involve *wh*-extraction from within [Spec, TopP]. Adjunction of the *wh*-element to E-Foc prior to the movement of TP to [Spec, TopP] is what licenses the later movement to [Spec, ForceP].

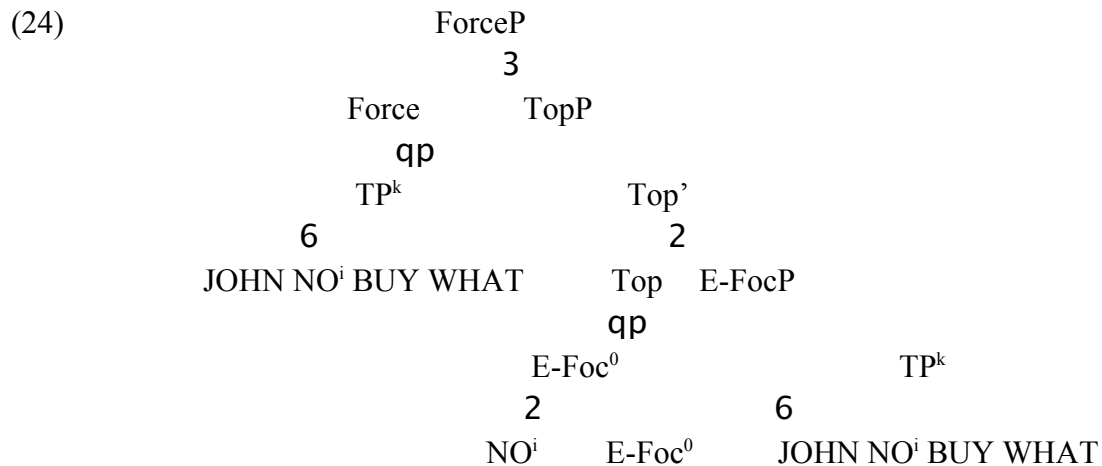## 5.   Independent Evidence

In the analysis proposed in section 4, adjunction to E-focus functions as an escape hatch for later *wh*-movement. If this is correct, we predict that if an element other than the *wh*-element undergoes focus duplication, the escape hatch would be blocked and *wh*-movement should be ruled out. That this prediction is correct is shown by the unacceptability of (22).

(22)   a. *[WHAT JOHN$_a$ NO $_a$BUY$_b$ NO]$_{wh}$
             'What did John in fact NOT but?'
         b. *[WHEN JOHN WILL BUY BOOK WILL]$_{wh}$
             'When in fact WILL John really buy the book?'

Notice furthermore that the unacceptability of (22) cannot be due to some incompatibility of *wh*-elements in constructions where another head undergoes E-focus duplication. If the *wh*-element remains *in situ*, the corresponding sentences are indeed acceptable, as shown in (23).

(23)   a. JOHN$_a$ [NO $_a$BUY$_b$ WHAT NO]$_{focus}$
             'What did John in fact NOT but?'
         b. JOHN [WILL BUY BOOK WHEN WILL]$_{focus}$
             'When WILL John really buy the book?'

The derivations of (22a) and (23a), for instance, share the same derivational steps up to the point where the structure in (24) below is assembled. Assuming that in the derivation of (23a), the *wh*-feature of Force is weak, no overt *wh*-movement is required and the structure surfaces as (23a), after *NO* fuses with E-Foc and the lower copy of TP is deleted, as shown in (25).

(24)   ForceP
                                    3
                        Force   TopP
                          qp
                        TP^k Top'
                      6   2
                JOHN NO^i BUY WHAT   Top   E-FocP
                                             qp
                                    E-Foc^0 TP^k
                                      2   6
                                  NO^i E-Foc^0 JOHN NO^i BUY WHAT

(25)   [$_{ForceP}$ Force [$_{TopP}$ [$_{TP}$ JOHN NO^i BUY WHAT]^k [$_{Top'}$ Top [$_{E-FocP}$ #NO^i+E-Foc#
         [$_{TP}$ JOHN NO^i BUY WHAT]^k]]]

By contrast, if Force has a strong *wh*-feature requiring overt *wh*-movement, as should be the case in (22a), there is no licit source for the required movement. It cannot be launched from within the lower copy of TP, since the material internal to copies left by movement is not accessible to further movement (cf. (14)). And it cannot be launched from within the higher copy of TP either, as this would violate of the Left Branch Condition or the CED.

Contrasts such as the one between (22) and (23) can also be replicated with embedded interrogative clauses. As shown in (26) below, in LSB *wh*-movement in an embedded clause is also optional. Furthermore, (27) shows that LSB allows embedded clauses to be associated with E-focus, as well.

(26)   a. [I WANT KNOW]$_{wonder}$ [WHAT MARY BUY]$_{wh\sim}$
        b. [I WANT KNOW]$_{wonder}$ [MARY BUY WHAT]$_{wh\sim}$
          'I want to know what Mary bought.'

(27)   a. GIRL [[BICYCLE FALL BICYCLE [FALL]$_{hn}$]$_r$ IS HOSPITAL
          'The girl who FELL from the bicycle is in the hospital.'
        b. [MARY WANT [PAY HOUSE PAY]$_{focus}$] [WANT]$_{hn}$
          'Mary does indeed want to pay the house.'

Given the analysis proposed above, the combination of these two properties of LSB makes the prediction that *wh*-movement in embedded interrogative clauses cannot be possible if an element other than the *wh*-element is duplicated. That is prediction is borne out is shown by the data in (28).

(28)   a. [I WANT KNOW]$_{wonder}$ [WHERE JOHN BUY BOOK YESTERDAY]$_{focus}$
          [WHERE]$_{focus}$
          'I want to know where exactly John buy the book yesterday.'
        b. [I WANT KNOW]$_{wonder}$ JOHN BUY [BOOK WHERE YESTERDAY]$_{focus}$
          [BOOK]$_{focus}$
        c. *[I WANT KNOW]$_{wonder}$ [WHERE JOHN BUY BOOK YESTERDAY]$_{focus}$
          [BOOK]$_{focus}$
          'I want to know where John bought THE BOOK (as opposed to the record).'

      Finally, let us consider the derivation of the sentence in (29) below after the structure in (30) has been assembled.

(29)   [WHICH BOOK JOHN BUY YESTERDAY]$_{wh}$ [WHICH]$_{wh}$
        'Which book exactly did John buy yesterday?'

(30)   [$_{E\text{-}FocP}$ WHICH^i+E-Foc [$_{TP}$ JOHN BUY [WHICH^i BOOK] YESTERDAY]]

As seen in (24), for instance, once TP moves to [Spec, TopP], the *wh*-phrase within TP will not be able to undergo movement to [Spec, ForceP]. The question then is what the difference in the derivation of (29) is, which allows both TP movement to the left of E-Foc and overt *wh*-movement.

      We would like to suggest that the relevant difference is related to feature compatibility in a Spec-head configuration. Let us assume that after (30) is built, the *wh*-phrases moves to [Spec, E-FocP] prior to TP movement, as shown in (31).

(31)   [$_{E\text{-}FocP}$ [WHICH^i BOOK]^k [$_{E\text{-}Foc'}$ WHICH^i+E-Foc [$_{TP}$ JOHN BUY [WHICH^i

BOOK]^k YESTERDAY]]]

In LSB, there can be only one E-focused element per clause. However, overt movement of the *wh*-phase to [Spec, E-FocP] in (31) does violate this constraint, because the two instances of the E-focused element *which* are nondistinct. The computation may then proceed with movement of TP to [Spec, TopP] and the merger of Force. As before, the copies of *which book* within TP are not available for purposes of movement, but the copy in [Spec, E-FocP] is. Movement of this copy to check the strong *wh*-feature of Force then yields the structure in (32) (with numbered copies for ease of reference).[12]

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[12] The derivation proposed here is in fact similar to the derivation proposed by Etxepare (1999) to account for some unexpected violations of CED islands in Spanish such as the one illustrated in (i) below, where *qué libro* 'which book' is apparently extracted out of the adjunct within the embedded clause. Based on the fact that constructions such as (i) are only allowed with a specific class of verbs (which also have other idiosyncratic properties), Etxepare proposes that the propositional complement of such verbs involves an extra layer of structure between CP and TP, which he refers to as FP. According to his analysis, the (partial) derivation of (i) proceeds along the lines of (ii)-(iv) (with English words for purposes of exposition). After K and L in (ii) have been assembled, *which book* undergoes sideward movement (see Nunes 2004) and merges with FP, yielding M in (iii). Further computations then involve the adjunction of the *if*-clause to FP and the merger of the embedded complementizer, yielding the structure in (iv). The relevant aspect of this derivation for our current discussion is that *wh*-movement to the embedded [Spec, CP] in (iv) cannot be launched from within the adjunct, but it can proceed from [Spec, FP]. Similar to the *wh*-excorporation cases discussed above and the derivation of (29), (sideward) movement to [Spec, TP] provides an escape hatch for the *wh*-movement that is later required in the derivation.
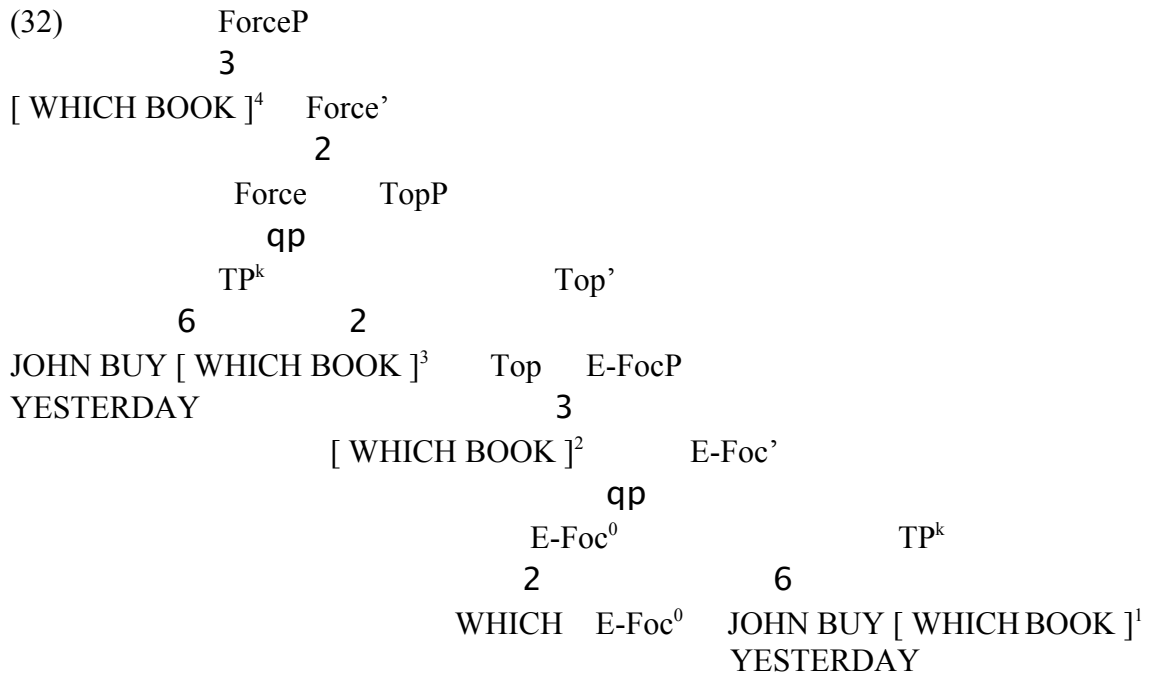
(i)   *Spanish* (from Etxepare 1999)
        [qué libro]$_i$ crees que [si Ricardo lee t$_i$ alguna vez] abandonará la linguística de inmediato?
        '[which book]$_i$ do you believe that [if Ricardo ever reads t$_i$] he will give up linguistics
        immediately?'

(ii)   a. K = [$_{CP}$ if Ricardo ever reads [which book]]
        b. L = [$_{FP}$ F [$_{TP}$ he will give up linguistics immediately]]

(iii)   M = [$_{FP}$ [which book]^i [$_{F'}$ F [$_{TP}$ he will give up linguistics immediately]]]

(iv)
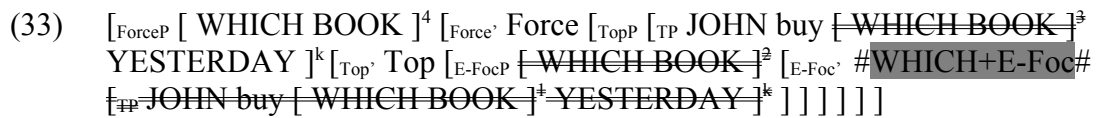   CP
                                               2
                                        that   FP
                                               3
        [$_{CP}$ if Ricardo ever reads [which book]^i]   FP
                                                            2
                                        [which book]^l F'
                                                            2
                                                    F   [$_{TP}$ he will give up linguistics immediately]

(32)   ForceP
                     3
[WHICH BOOK]⁴   Force'
                          2
              Force   TopP
                   qp
              TPᵏ   Top'
              6   2
JOHN BUY [WHICH BOOK]³   Top   E-FocP
YESTERDAY   3
                    [WHICH BOOK]²   E-Foc'
                                      qp
                              E-Foc⁰   TPᵏ
                              2   6
                    WHICH   E-Foc⁰   JOHN BUY [WHICH BOOK]¹
                                      YESTERDAY

After (32) is built, the highest copy of *which book* forms two forking chains: CH_1 = (copy⁴, copy³) and CH_1 = (copy⁴, copy², copy¹). Fusion between *WHICH* and E-focus in the morphological component and applications of Chain Reduction to CH_1, CH_2, and the TP chain then yield the structure in (33), which finally surfaces as (29).

(33)   [ForceP [WHICH BOOK]⁴ [Force' Force [TopP [TP JOHN buy ~~[WHICH BOOK]~~³
        YESTERDAY]ᵏ [Top' Top [E-FocP ~~[WHICH BOOK]~~² [E-Foc' #WHICH+E-Foc#
        ~~[TP JOHN buy [WHICH BOOK]~~⁴ ~~YESTERDAY]~~ᵏ]]]]]]

        Crucially, *wh*-movement to [Spec, E-FocP] in (24), for instance, which would incorrectly rule (22) in, is not an option. If the *wh*-element has emphatic focus, the restriction on the number of E-focused elements per clause is violated, for *NO* is E-focused. On the other, if the *wh*-phrase is not focused, it cannot move to [Spec, E-FocP]. Thus, the escape hatch made available in the derivation of (29) does not overgeneralize.

        To summarize, the proposal advanced in section 4 receives independent support from the intricate relation between *wh*-movement and E-focus duplication involving non-wh-elements.

6.   Concluding Remarks

This paper has shown that despite appearances to the contrary, duplication of *wh*-elements in LSB is not essentially different from E-Focus duplication of other elements

in this language, regardless of whether the relevant constructions involve *wh-in situ* or standard leftward *wh*-movement. The duplication itself arises as a by-product of the morphological fusion affecting the E-Focus head and the *wh*-element adjoined to it. The fused *wh*-element becomes invisible to the LCA and need not – therefore must not – be deleted by Chain Reduction in the phonological component. However, in the syntactic component, the *wh*-element adjoined to E-Focus is accessible to the computation and may move to [Spec, ForceP], yielding constructions involving both *wh*-duplication and leftward *wh*-movement. Hence, *wh*-movement in E-focus duplication constructions is allowed only if the *wh*-element itself is duplicated. In other words, adjunction to E-Focus provides a *wh*-element with an escape hatch to reach [Spec, ForceP].

To the extent that the analysis proposed above is on the right track, it offers an indirect argument to say that sign languages are linearized like spoken languages in that (lack of) deletion of chain links is regulated by the same linearization and economy considerations in both types of languages. In other words, linearization of chains appears to be insensitive to differences of modality.

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