The derivation of highest subject questions and the nature of the EPP

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Abstract This squib argues that matrix subject wh-phrases reside in SpecCP and moreover during the course of the derivation, never move to SpecTP. This observation raises an immediate problem for languages with a strong EPP requirement on T, such as English. I argue that Chomsky (2013)'s approach to EPP effects (and other similar approaches) predict the observed pattern, while other prominent theories of the EPP fail to account for it.

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Linguists have learned a great deal about (internal) language by looking at complex constructions in a number of different (external) languages, but sometimes constructions that seem simple on the surface can also shed light on the workings of the grammar and fundamental theoretical issues. Take for example the English highest subject question in (1).

(1) Who left?

Despite its straightforward appearance, there is very little consensus on what the proper derivation for (1) should be. The most intuitive and standard analysis would have the *wh*-phrase moving to the specifier of CP through the TP specifier (e.g., Pesetsky & Torrego 2001), as shown in (2).[1]

[1] Note that the lack of *do*-support in such constructions follows from the morphological merger approach to *do*-support (Halle & Marantz 1993; Bobaljik 1995; Lasnik 1995b). Since the affix in C (assuming T-to-C) is PF adjacent to the verb, morphological merger is not blocked here (traces do not block it), hence *do*-support does not take place. See also Pesetsky & Torrego (2001) for an alternative analysis. *Do* does appear in emphatic uses in highest subject questions (e.g., *Who DID leave?*). I suspect that whatever mechanism that conditions emphatic *do* in non-questions (e.g., *John DID (so) leave*) is also responsible here (see Bruening 2010; Biberauer & Roberts 2012 for recent approaches and discussion to emphatic *do*).

(2) [$_{CP}$ who [C [$_{TP}$ t [$_{T'}$ T [$_{vP}$ t left]]]]]

Still, many authors have argued that unlike other types of *wh*-questions, highest subject *wh*-phrases do not move to the specifier of CP and instead stay in the specifier of TP (e.g., George 1980; Chung & McCloskey 1983; Chomsky 1986; Agbayani 2000; Carstens et al. 2016; Gallego 2017).

(3) [$_{CP}$ C [$_{TP}$ who [$_{T'}$ T [$_{vP}$ t left]]]]

Yet other authors assume (explicitly or implicitly) that the *wh*-phrase moves directly from its argument position inside the *v*P to the specifier of CP, eschewing intermediate movement to the specifier of TP (e.g., Rizzi 1982; Brandi & Cordin 1989; Campos 1997; McCloskey 2000; Holmberg & Hróarsdóttir 2003; Fitzpatrick 2006; Bošković 2016; Erlewine 2016), as shown in (4).

(4) [$_{CP}$ who [C [$_{TP}$ T [$_{vP}$ t left]]]]

As I will detail below, there is evidence that (4) is indeed the correct derivation, but the derivation in (4) raises an immediate question about the status of the EPP on T in languages like English where there appears to be an otherwise obligatory constraint that the specifier of TP be filled. In fact, the authors arguing for the derivation in (4) have not provided a satisfying answer to this question (though there have been analyses that account for a derivation like (4) with languages that allow null subjects such as Romance languages (Rizzi & Shlonsky 2007) and Bantu languages (Diercks 2010)) .[2]

[2] It should be noted that the disagreement about the placement of the *wh*-phrase in highest subject questions is especially acute in English because the lack of *do*-support and also the lack of other obvious effects on word order. In other languages, such as Mainland Scandinavian languages, there is much more robust evidence that favors a representation that places the *wh*-phrase in the specifier of CP. Take for example the Swedish cases in (i). In (ia), the order of the finite verb *har* and negation *inte* indicate that the verb has raised to the V2 position in C. Hence, as the *wh*-phrase *vem* precedes the verb, it indicates that *vem* occupies SpecCP. Likewise in embedded clauses, *vem* precedes the complementizer *som*, again indicating that *vem* resides in SpecCP (see Holmberg 1986 and much subsequent work).

(i) a. Vem har inte läst boken?
who has not read book-the
'Who has not read the book?'
b. Hon undrar vem som inte har läst boken.
she wonders who that not has read book-the
'She asks/wonders who has not read the book.'

While this is not as obvious from the word order in English, the evidence documented in the next section shows that English is like Swedish in that highest subject *wh*-phrases also reside in SpecCP.

In the literature, there have been two general approaches to EPP effects. On the standard account, T has a formal requirement that its specifier be filled. In the feature checking framework, this was accomplished by T having an uninterpretable feature that could only be checked by movement to its specifier (Chomsky 1995; 2000; 2001). In the labeling framework, Chomsky (2015), argues that T is too "weak" to label on its own, and hence requires a specifier in order to project. The other view of EPP effects takes them to be epiphenomenal. T does not have a specifier requirement. Movement to the specifier of TP is independently motivated either to check the features of the moving element (Epstein & Seely 2006; Bošković 2007) or to repair an otherwise illicit interface representation (Alexiadou & Anagnostopolou 2001; 2007; Landau 2007; Richards 2010; 2016; Bayer & Salzmann 2013; Chomsky 2013; McFadden & Sundaresan 2018). Chomsky (2013) provides such an account within this view in the labeling framework. Under this account, merging of the subject and *v*P causes a problem for the labeling algorithm that is remedied by the subject moving away. The latter view of EPP effects quite naturally allow for a derivation like (4), while the standard analysis fails to account for it. The paper first reviews the arguments from the literature that there is no movement to the specifier of TP in highest subject questions. Then it provides an analysis of the lack of movement to the specifier of TP in the labeling framework of Chomsky (2013).

1 Arguments for direct movement to CP

In this section, I will present arguments that the correct derivation for highest subject questions involves direct movement from the *wh*-phrase's base position to the specifier of CP. I will first present three arguments against the *wh*-staying-in-SpecTP approach and then two arguments against the intermediate movement to the specifier of TP approach. [3]

[3] Agbayani (2000: 704) argues that the data below in (i) provide evidence that highest *wh*-subjects do not move to SpecCP. The data in (i) show that highest subjects cannot be moved to the left periphery via topicalization (original observation is from Lasnik & Saito 1992).

(i) a. John, I like *t*.
b. *John, *t* left.
c. John thinks that Bill, Mary likes *t*.
d. *John thinks that Bill, *t* likes Mary.

Agbayani takes this data to indicate that short movement of subjects (including *wh*-movement) to the left periphery is generally disallowed. In order for this argument to go through, however, we must assume that topicalization is a perfect proxy for *wh*-movement, but evidence suggests that the two movement types diverge in non-trivial ways. For instance, Postal (1994) and Poole (2017) show

1.1 Arguments against staying in the specifier of TP

Let us first examine the arguments against the subject *wh*-phrase staying in SpecTP. The first argument comes from agressively non-d-linked *wh*-phrases (Pesetsky 1987; Ginzburg & Sag 2000). Ginzburg & Sag (2000: 229-337) and Pesetsky & Torrego (2001: fn.9) note that the distribution of aggressively non-d-linked *wh*-phrases like *what/who the hell* is a subset of the distribution of plain *wh*-phrases (see also den Dikken & Giannakidou (2002) for an analysis of these phrases in matrix and embedded environments). As (5) shows, while aggressively non-d-linked phrases can occur in the specifier of CP, they cannot occur in situ.

(5) a. What the hell did you buy?
b. *Who bought what the hell?

The authors take the acceptability of constructions like (6), involving an aggressively non-d-linked subject *wh*-phrase, to provide evidence that the *wh*-phrase here moves to the specifier of CP,[4] because if it stayed in SpecTP we would expect (6) to be ungrammatical on a par with (5b).

(6) Who the hell bought a car?

Another argument for movement to the specifier of CP was noted in Agbayani (2000: fn.2). Agbayani notes that the typical analysis of the elliptical construction known as sluicing involves movement to the specifier of CP followed by deletion of the TP, as shown in (7).

(7) John bought something, but I don't know what ~~John bought t~~

If this analysis is correct, then the existence of sluices where the *wh*-phrase is a highest subject indicates that the subject moves out of TP into the specifier of CP.

(8) A: Someone bought a car.
B: Who ~~t bought a car~~?

In order for this argument to go through, a few possible alternative explanations must be ruled out that Agbayani did not consider. First, the example in (8) cannot be analyzed as an instance of what is called pseudosluicing or deletion of an underlying cleft, as illustrated in (9).

there a number of environments that disallow topicalization, but do allow for *wh*-movement. So although it may be the case that highest subjects cannot be topicalized, it does not, however, indicate that they also cannot undergo *wh*-movement to SpecCP.

[4] In den Dikken & Giannakidou (2002)'s analysis, the specifier of a Focus projection.

(9) A: Someone bought a car.
B: Who ~~was it~~?

Merchant (2001) presents a number of tests that can control for a derivation like the one in (9). One test is the use of *else*-modification. As Merchant shows, *else*-modification is incompatible with clefts as shown in (10a), but is acceptable in sluicing (10b) (capitalization indicates focal stress).

(10) a. #John bought A CAR, but I don't know what else it was.
b. John bought A CAR, but I don't know what else.

If the matrix sluice in (8) is an underlying cleft, then we would expect an *else* modified matrix subject sluice to pattern with (10a) in being unacceptable, but if the source of such sluices is indeed full syntactic structure, then we would expect such an example to pattern with (10b). As (11) shows, a matrix subject sluice is acceptable with *else* modification, indicating that the source of such sluices is not underlying cleft.

(11) A: A TELEVISION was stolen.
B: What else?

Second, one may wonder whether the correct generalization is that any moved *wh*-phrase can license the deletion of its sister. This would allow for the example in (8) to not involve ellipsis of TP as is standardly assumed, but rather T'. Stjepanović (1999), however, provides evidence against such an analysis. Stjepanović shows that *wh*-phrases in Serbo-Croatian may front below CP, but in cases where sluicing applies, the *wh*-phrase must reside in Spec CP.

The final argument I will discuss involves apparent coordinate structure constraint (CSC) violations such as (12) discussed in Bošković (2018).

(12) *Who left and John went to the store?

If subject *wh*-phrases were able to stay in the specifier of TP, as schematized in (13a), the structure would not violate the CSC and examples like (12) would be predicted to be grammatical, contrary to fact. If there is movement to the specifier of CP as in (13b), we have a CSC violating structure and correctly predict the ungrammaticality of (12).

(13) a. [$_{\&P}$ [$_{IP}$ who left] & [$_{IP}$ John went to the store]]
b. [$_{CP}$ who$_i$ [$_{\&P}$ [$_{IP}$ t$_i$ left] & [$_{IP}$ John went to the store]]]

Evidence that this is indeed a CSC violation comes from the fact that the structure can be salvaged by the across-the-board exception to the CSC shown in (14).

(14) a. Who left and went to the store?
b. [$_{CP}$ who$_i$ [$_{\&P}$ [$_{IP}$ t$_i$ left] & [$_{IP}$ t$_i$ went to the store]]]

All these data suggest that subject *wh*-phrases do not stay in the specifier of TP and instead, like all other *wh*-phrases, move to the specifier of CP. The next section will further provide evidence that not only do subject *wh*-phrases not stay in the specifier of TP, they never move to that position in the first place.

1.2 Arguments against intermediate movement to TP

I will present two arguments that movement of highest subject questions does not stop off in the specifier of TP. The first argument I will present comes from the distribution of quantifier float in West Ulster English, as described in McCloskey (2000) and further elaborated in Fitzpatrick (2006) and Henry (2012).

(15) *West Ulster English* (McCloskey 2000: 58)
a. What did you get all for Christmas?
b. Who did you meet all when you were in Derry?
c. Where did they go all for their holidays?

Importantly, highest subject questions also allow for quantifier float (16a), although, as in standard English, quantifier float is impossible in (16b). The possibility of quantifier float in (16a) is unexpected if there is first A-movement to the specifier of TP as that movement step would be indistinguishable from the movement in (16b), where quantifier float is impossible.

(16) *West Ulster English* (McCloskey 2000: 77)
a. Who was throwing stones all around Butchers' Gate?
b. *They were throwing stones all around Butchers' Gate.

These data suggest that the proper treatment of highest subject sentences is one in which the *wh*-phrase moves directly from its base position to the specifier of CP without intermediate movement to the specifier of TP.[5]

[5] One may wonder about the possibility of examples like the following (taken from McCloskey 2000: 78 fn. 32)

(i) Who was all throwing stones in Guildhall Square?

The possibility of such examples would suggest that *wh*-movement does not proceed directly to the specifier of CP because it appears *all* can be stranded in an intermediate position. As reported by McCloskey, most informants do find such examples unacceptable, but there is inter speaker variation. This was further backed up by dialectal work described in Henry (2012). For dialects that do allow

The second argument comes from extraction out of British *do* ellipsis as discussed in den Dikken & Griffiths (2018) . It has been noted that A-movement is allowed out of such ellipsis while *wh*-extraction is not allowed. This is shown in (17). In (17a), we have an example of NP-raising out of the elided VP and the example is grammatical even with *do* suggesting that A-movement is possible out of such constructions. In (17b), on the other hand, we have *wh*-movement of an object out of the ellipsis site and the result is ungrammatical with *do*, suggesting that this type of extraction is disallowed.

(17) *British English* (den Dikken & Griffiths 2018: (21)-(22))

a. John might seem to enjoy that, and Pete$_i$ might (do) ~~seem t$_i$ to enjoy that~~ too.

b. I know who$_i$ John will kiss and who Pete will (*do) ~~kiss t$_i$~~

Crucially, wh-movement in highest subject questions is also disallowed out of *do* ellipsis, as shown in (18). This again suggests that movement of highest *wh*-subject questions does not involve a step of A-movement to the specifier of TP that feeds movement to the specifier of CP, as if this were the case we would expect such a movement to be possible in (18) just as it possible in (17a). The fact that (18) and (17b) pattern together suggests that movement of highest subject questions instead move directly to the specifier of CP without an intermediate step of A-movement.

(18) *British English* (den Dikken & Griffiths 2018: (23))
A: Sue wouldn't kiss Peter last night
B: Well, who$_i$ would (*do) ~~t$_i$ kiss him~~

These data point to a conclusion that has been reached by a number of authors: that movement from SpecTP to SpecCP is generally not allowed. This has been confirmed for a number of languages such as dialects of Italian (Rizzi 1982; Brandi & Cordin 1989; Campos 1997; Rizzi & Shlonsky 2007), Lubukusu (Diercks 2010), Kaqchikel (Erlewine 2016) and Kinande (Bošković 2016).[6]

for such examples, Henry puts forth an analysis where the quantifier is stranded at the *v*P phase edge and not the edge of TP (see also Davis 2018 for discussion).

[6] For example in Trentino and Florentino preverbal but not post verbal subjects are able to control full agreement on the verb, as shown by (i). In the cases where full agreement is not controlled, we find what is called the neutral clitic *gl(i)* (the third person masculine clitic form) as in (ib) (Campos 1997: 93).

(i) a. Le ragazze **l'=hanno** telefonato.
the girls **CL.3PL=has.3PL** phoned
'Some girls have telephoned.'

b. **Gl'=ha** telefonato delle ragazze.
CL.3M.SG=has.3M.SG telephoned some girls

The languages cited above, however, do not have a strong EPP requirement on T, but the data presented here suggest that this also the case in languages like English where there is otherwise an obligatory requirement that the specifier of TP be filled. This raises the question, if the subject *wh*-phrase can move directly to the specifier of CP, how can the EPP be satisfied? In the next section, I will provide an answer to this question building off of the labeling theory in Chomsky (2013).

2 An analysis of the Lack of EPP

There have been two approaches to the movement of the subject to the specifier of TP in the literature. The traditional approach posits that the target (i.e., T) is deficient or needy in some way: it has an EPP/D/Edge feature that needs to be checked by having an element in its specifier. The second approach argues that the movement in question is triggered by the moving element or by the need to repair an illicit interface representation. In recent work, Chomsky has provided two approaches to the EPP in the labeling framework (Chomsky 2013; 2015). Chomsky (2015) is the traditional account where T is deficient; Chomsky (2013) on the other hand, is in the spirit of the second approach. As detailed below, the lack of EPP effects in highest subject questions can be easily accounted for in the system presented in Chomsky (2013), but it is difficult to capture under the traditional approaches to EPP, including Chomsky (2015).

Chomsky (2013), following work by Moro (2000; 2008), gives an algorithm for providing labels to newly created syntactic objects. When a head and a phrase undergo merge, the head provides the label for the output. When two non-minimal projections undergo merge, there are two possible ways for this output to be labeled: (i) prominent feature sharing, where the shared feature provides the label for the object; or (ii) one of the two phrases undergoes movement, allowing for the remaining phrase to project the label (traces are ignored for labeling). With this in

'Some girls have telephoned.'

Interestingly, highest subject questions pattern with (ib) in not showing full agreement and instead showing the neutral clitic form (ii).

(ii) a. Quante ragazze **gli=ha** parlato con te?
how.many girls **CL.3M.SG=has.3M.SG** spoken with you
'How many girls talked to you?'

b. *Quante ragazze **le=hanno** parlato con te?
how.many girls **CL.3PL=has.3PL** spoken with you
Intended: 'How many girls talked to you?'

This follows if the *wh*-phrase cannot even pass through SpecTP on its way to SpecCP, assuming that full agreement can only be controlled by a subject in SpecTP.

mind, let us examine the configuration where the subject is first merged into the derivation.

(19) [? DP [$_{vP}$ v [. . .]]]

When the subject, a DP, merges with the vP, we have the case of merge with two phrases. There is then no head that can project the label so the label needs to be provided by either feature sharing or movement. Since the vP and DP do not share features here, the only possibility is movement. The derivation continues with the T being merged into the derivation; as a head, T will project as the label of the object in question. The DP then moves to the specifier of TP, allowing for the v to project a label in the lower part of the structure. Since the the DP and T share ϕ-features, the new object is labeled with those features.

(20) [$_{\phi}$ DP [$_{TP}$ T [$_{vP}$ t [v [. . .]]]]]

Unlike traditional approaches to movement of the subject to the specifier of TP, this analysis does not rely on T being deficient in any way: there is in fact, no requirement for T to have a specifier. It is the "local instability" between the DP and vP, discussed above, that drives the movement of the subject to the specifier of TP.

Returning to highest subject questions, again when the subject is first merged, the resulting structure cannot be labeled.

(21) [? DP$_{[+wh,+Q]}$ [$_{vP}$ v [. . .]]]

The T is merged into the derivation, and it again projects a label. C is then merged and projects a label. Since T is not deficient in any way and hence does not require a specifier, the subject can move directly to the specifier of CP. The labeling problem at the vP is again resolved as there is only one phrase left to project, and the output of subject DP and CP undergoing merge can be labeled via sharing of the [+Q] feature.

(22) [$_{Q}$ DP$_{[+wh,+Q]}$ [C$_{+Q}$ [$_{TP}$ T [$_{vP}$ t [$_{vP}$ v [. . .]]]]]]

The "local instability" approach hence allows us to give a principled explanation for why the otherwise obligatory movement to the specifier of TP does not occur in highest subject questions. [7]

[7] As a reviewer notes, under this analysis, a derivation of matrix subject question with movement to the specifier of TP followed by movement to SpecCP would also converge, but as discussed in section 1.2, the data point to such movement never taking place.One way of blocking such a derivation is to rely on an Anti-locality condition (Erlewine 2016; Bošković 2016) which blocks movement that is too short. Erlewine and Bošković both argue that movement from SpecTP to SpecCP runs afoul of

Let us now investigate how the standard approach would deal with such data using Chomsky (2015) as a model though this holds of any variant of the standard approach. Chomsky proposes that T is "too weak" to provide a label on its own, which means that the result of merge in (23a) cannot be labeled. T requires merger with another element that it agrees with in its specifier in order for labeling in (23b) to occur.

(23) a. $[_{?}$ T $[_{?}$ DP $[_{vP}$ v [. . .]]]]
b. $[_{\phi}$ DP $[_{TP}$ T $[_{vP}$ t [v [. . .]]]]]

Now in highest subject questions, if the subject *wh*-phrase were to move directly to the specifier of CP, a problem arises under this approach. Because T is too weak to label on its own, the output of its merge with *v*P in this hypothetical representation is never labeled and the derivation does not converge as a result.

(24) $[_{Q}$ $\text{DP}_{[+wh,+Q]}$ [C_{+Q} $[_{?}$ T $[_{vP}$ t $[_{vP}$ v [. . .]]]]]]

Hence, the only convergent representation under this approach would have the subject *wh*-phrase move to the specifier of TP before moving to the specifier of CP, but the data from *all* float and *do*-ellipsis extraction presented in the previous section demonstrate that such a movement step does not in fact take place.

In this section, I have shown that the lack of movement to the specifier of TP in highest subject questions can be naturally captured by approaches where movement to the specifier of TP is not tied to a deficiency of T. Approaches that tie the movement in question to such a deficiency face a problem with the derivation of subject questions.

3 Further issues

The previous section demonstrated that the Chomsky (2013) approach to EPP effects allows for a natural explanation for the lack of movement to the specifier of TP in highest subject questions. The question arises whether such an approach can further extend to account for other types of EPP and subject movement effects found cross-linguistically. As noted in the previous section, it has been argued that languages from Romance, Bantu and Mayan families also have direct movement to SpecCP in highest subject questions. This pattern seems robust cross-linguistically, and hence the analysis presented here has at least some cross-linguistic generality. There are other EPP related constructions that need to be looked at in more

such a condition. One other possibility, hinted at by the reviewer, is to block the derivation on the grounds of economy conditions. A converging derivation with two steps of movement is blocked by a converging derivation that only requires one step of movement.

detail within this framework (e.g., stylistic fronting and quirky subjects in Icelandic (Holmberg 2000; Sigurðsson 2010; 2017), transitive expletive constructions also in Icelandic (Bobaljik & Jonas 1996), VP-fronting with the subject in German (Wurmbrand 2006), and the subject/object asymmetry in the island effects in relative clauses (Chung & McCloskey 1983) to name a few). I leave much of this investigating to future work, however, this section briefly investigates one additional area where the EPP is relevant: the presence of overt expletives in existential constructions.

The expletive *there* in existential constructions, as in (25a), is typically thought to be merged directly into the specifier of TP purely to satisfy the EPP (Lasnik 1995a; Chomsky 2000; 2001) .

(25) a. There arrived a train in the station.
b. *arrived a train in the station.

A number of authors (Richards & Biberauer 2005; Deal 2009; Alexiadou & Schaefer 2011; Wu 2018), however, provide evidence that *there* must first be merged at the edge of *v*P phase.[8] If this is truly the case, then the local instability of the labeling algorithm of *v* and *there* would again cause *there* to move to the specifier of TP. T and *there* would agree in ϕ-features and label the resulting structure (*there* shares ϕ-features with the associate DP via an independent agreement relation see Deal 2009). It again appears that the local instability approach can account for the data without the need of an EPP.[9]

4 Discussion and Conclusion

This paper investigated the nature of the EPP through the lens of highest subject questions. The EPP has been a contentious issue in syntactic theory, as the typical analysis of it involves positing features on T that merely encode the need of a specifier. Because of this, many authors have attempted to eliminate the EPP, arguing instead that the effects often attributed to it in fact follow from other independent

[8] See also Richards (2016) for another approach to expletives in existential constructions that does not require an EPP feature on T.

[9] Note that filling the specifier of TP with an expletive can also occur with an *all* stranding wh-phrase (McCloskey 2000:79 fn. 33).

(i) Who was there throwing stones all down the town?

In such cases, both the expletive and the wh-phrase would begin the derivation within the *v*P phase. Subsequently the expletive moves to the specifier of TP and the label for the phrase is created via ϕ-feature sharing with the T head. The wh-phrase likewise moves to the specifier of CP where the phrase is labeled via Q-feature sharing.

aspects of the grammar. These works typically show that EPP-less theories can have the same empirical coverage as theories that do employ the EPP. This paper argues further that not only can the EPP-less theories account for the same data as the EPP theories; they, in fact, have superior empirical coverage because they correctly predict that the requirement of T to have a specifier be lifted in highest *wh*-subject questions. This was demonstrated via a comparison of Chomsky's recent analyses within the labeling framework.

Abbreviations

3 = third person, M = masculine, SG = singular, PL = plural, CL = clitic

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