

English Wh-exclamatives and the Role of T-to-C in Wh-clauses

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Abstract

This paper attempts to develop Pesetsky and Torrego's (2001) idea that the C of wh-interrogatives and the C of wh-exclamatives are syntactically identical. The discussion starts with their assumption that the C of wh-clauses has an uninterpretable Tense feature and an uninterpretable wh-feature. It is argued that English facts suggest that, as Pesetsky and Torrego claim, the C of wh-exclamatives and the C of wh-interrogatives are the same item. We then propose that when the Tense feature of C is checked by a factive operator, the wh-clause must be interpreted as exclamative. It is shown that the present proposal can account for similarities and differences between the two constructions, including those potentially problematic for Pesetsky and Torrego's original analysis.

Introduction

As has been widely observed, wh-interrogatives and wh-exclamatives in English share a number of significant syntactic properties (Ross, 1967; Elliot, 1974; Grimshaw, 1979). For instance, wh-movement is obligatory in exclamatives in the same way as in interrogatives.

- (1) a. Which guy did you dance with at the party?
b. *You danced with which guy at the party? (under non-echo interpretation)
- (2) a. What a strange guy you danced with at the party!
b. *You danced with what a strange guy at the party!

The specifier of C must be filled with a wh-phrase at surface structure in both constructions. In addition, as already pointed out by Ross (1967), locality restrictions found in wh-interrogatives (and other A'-movement) hold for wh-exclamatives. Wh-movement in exclamatives, like that in interrogatives, displays unbounded dependency, as in (3). The examples presented in (4)-(7) show that the movement in question obeys various island constraints: the Complex NP Constraint (see (4)), the Coordinate Structure Constraint (see (5)), the (Sentential) Subject Condition (see (6)), and the Left Branch Extraction (see (7)). ((3)-(7)a are from Ross, 1967: 210-11)

- (3) How brave everyone must think you expect me to believe he is!
- (4) a. *How brave I know a boy who is!

- b. *How brave they must believe the claim that you are!
- (5) a. *How brave he is tall and!
- b. *How brave Mike is cowardly and Sam is!
- (6) a. *How brave that Tom is must be believed!
- b. How brave it must be believed (?that) Tom is!
- (7) a. *How he is brave!
- b. How brave he is!

Thus it seems uncontroversial that wh-exclamatives involve A'-movement just as wh-interrogatives do.

However, there are a few places where these two constructions behave differently. As observed by Elliot (1974) and Grimshaw (1979), subject-auxiliary inversion (or *do*-support), which has been taken to be an instance of T-to-C movement, is required in matrix interrogatives except when the local subject moves to Spec-CP; but it never occurs in matrix (and embedded) exclamatives. Pairs like those given in (8) (from Grimshaw, 1979) and (9) make this point. Note that “*what a(n) adjective NP*” cannot appear in interrogatives and that *who* cannot appear in matrix exclamatives (see Ross, 1967:210-11; Grimshaw, 1979:81ff; and especially Zanuttini and Portner, 2003:73ff. for discussion about wh-phrases in the relevant context).¹ Using these items, we can force a wh-clause to be either exclamative or interrogative and thereby we are able to confirm that wh-exclamatives resist subject-auxiliary inversion or *do*-support.

- (8) a. What a big house he lives in!
- b. *What a big house does he live in!
- (9) a. *Who she saw?
- b. Who did she see?

Elliot (1974) and Grimshaw (1979) further observe that the two kinds of wh-clauses, when embedded, have to be selected by different classes of predicates. As shown in (10) (from Grimshaw, 1979), interrogative predicates such as *wonder* take a wh-interrogative clause as their complement but not a wh-exclamative clause.

¹ Of course, we need well-motivated criteria that tell us whether a given example counts as interrogative or as exclamative. Zanuttini and Portner (2003) propose that the notion of exclamative as a “sentential force” must be distinguished from exclamation as an illocutionary force. For example, *he is so cute!* has the illocutionary force of exclaiming but is categorized as declarative by their criteria. Such declaratives must be separated from exclamatives such as *how very cute he is!*, which are associated with the sentential force of exclamative. The reader is referred to Zanuttini and Portner (2003) for details of their position.

- (10) a. I wonder whether he lives in a large house.
b. *I wonder what a large house he lives in.

Conversely, factive predicates such as *be surprised at* or *amazing* can take as their complement a wh-exclamative clause but not a wh-interrogative one.

- (11) a. It's amazing what a large house he lives in.
b. *It's amazing whether he lives in a large house.

These facts thus suggest that exclamatives do not occur in environments where interrogatives occur, and vice versa.²

Now notice that it is perfectly imaginable (and has been often assumed explicitly or implicitly) that English has “C_{wh-exclamative}” independently of “C_{wh-interrogative}” in the lexicon and that these complementizers have a feature that attracts a wh-phase to its specifier. But such a theory cannot exclude without extra assumptions the possibility that both C's do (or do not) have a feature F, which is responsible for subject auxiliary inversion/*do*-support, or the possibility that exclamative C has F while interrogative C does not. These possibilities are not attested, as is evident from the observations so far. We thus take this to suggest that we need a theory of wh-clauses that is restrictive enough to rule out these unattested possibilities. Pesetsky and Torrego's (2001) (henceforth P&T) approach to wh-clauses gives an answer to why these unattested possibilities do not exist. In their theory, neither “interrogative wh-clauses” nor “exclamative wh-clauses” exist in a syntactically significant sense; Wh-clauses are just what they are.³ The gist of their approach is that a wh-CP is *interpreted* either as interrogative or as exclamative by some interpretive rule of the form “wh-CP is interpreted as exclamative if ...; otherwise it is interpreted as interrogative.” The goal of this paper is to attempt to recognize some empirical problems with P&T's analysis of wh-clauses and to refine their analysis so that these problems may be solved while maintaining the advantage of their analysis discussed just above.

The organization of the paper is as follows: Section 1 observes the similarities and differences between the two constructions that will be taken up when we evaluate P&T's analysis of wh-clauses. In section 2, we review their analysis in some detail and point out that some of the facts that we see in section 1 pose potential problems for their analysis. Section 3 lays out our proposal and shows that we can account for the problematic facts in question. In section 4, we

² There are ambiguous predicates like *find out*, which can take either interrogatives or exclamatives. See Grimshaw 1979 on this matter.

³ We will set aside relative clauses and clauses whose specifier is filled with a null operator, e.g. infinitival clauses of *tough* or *too/enough* constructions. See Pesetsky and Torrego (2001) for discussion.

examine two other differences between *wh*-interrogatives and *wh*-exclamatives, pointing out that one of them is potentially in favor of our proposal while the other does not differentiate the two approaches at issue. Section 5 concludes the paper by mentioning that Zanuttini and Portner's (2003) proposal about the semantics of exclamatives is harmonious with our analysis.

1 Relevant Facts

This section reviews properties of *wh*-interrogatives and *wh*-exclamatives: some are common to both of them, and some differentiate between them.

1.1 T-to-C Movement As noted in the previous section, matrix *wh*-interrogatives must involve T-to-C movement as in (12), while *wh*-exclamatives never involve inversion as in (13) (=8).

- (12) a. Which house does he live in?
 b. *Which house he lives in?
 (13) a. What a big house he lives in!
 b. *What a big house does he live in!

However, there is an instance of *wh*-interrogative that does not seem to involve T-to-C movement: when the moving *wh*-phrase is the local subject. In this instance, *do*-support does not take place, as in (14).

- (14) a. Who left?
 b. *Who did leave?

Thus, any adequate analysis of *wh*-clauses must account for, on the one hand, the obligatoriness of *do*-support/subject-auxiliary inversion in non-subject *wh*-questions such as (12) and, on the other hand, its absence in exclamatives such as (13) and in subject *wh*-questions such as (14).⁴

⁴ In addition to properties having to do with *do*-support or subject auxiliary inversion, the two *wh*-constructions differ in some other respects. We make notes on some differences here, though they are less relevant to our major point. First, at least in English, multiple exclamatives are disallowed while multiple interrogatives are allowed, as seen in (i) (Nelson, 1997; Zanuttini and Portner, 2003: 73, fn. 38)). In passing, English contrasts with Japanese, as Ono 2004 and Oda 2003 observe, as in (ii), which is an exclamative with two *wh*-phrases.

- (i) a. Which present did Susan give to which boy?
 b. *What an expensive present Susan gave to what a stupid boy!
 (ii) Susan-wa nante bakana otokonoko-ni nante takai purezento-o ageta-n(o)da-roo!
 Susan-TOP what stupid boy-DAT what expensive present-ACC gave-NODA-MOOD
 Further, Emonds (1985:277) reports that preposition pied-piping is poor in exclamatives ((ia/b) are Nelson's 1997 (12a/13a)).
 (ii) a. *To what a crook he lent his house!

1.2 Embeddability The second property of wh-clauses that will be important in our discussion later on has to do with embeddability. Both wh-interrogatives and wh-exclamatives can be embedded (Elliot, 1974; Grimshaw, 1979).

- (15) a. I wonder how fast John can run.
b. I'm surprised at how very fast John can run. (Grimshaw, 1979:282)

While currently a small matter, this property gains much more importance when we examine P&T's theory in section 3.

1.3 Sluicing Finally, both wh-interrogatives and wh-exclamatives allow matrix and embedded sluicing. Sluicing is an ellipsis phenomenon first extensively discussed by Ross (1969), and since then, it has drawn many researchers' attention (Chung, Ladusaw and McCloskey, 1995; Merchant, 2001; Lasnik, 2001; among others). The example in (16) is an instance of embedded interrogative sluicing, where nothing but the fronted wh-phrase in the embedded clause is pronounced. The wh-phrase *who* is interpreted as the object of *met*. (See Ross, 1969 for powerful arguments for the ellipsis analysis.)

- (16) John met someone, and I wonder who ~~John met t~~.

Sluicing is not limited to the embedded context. It is available in the matrix as well (Merchant, 2001; Lasnik, 2001), as seen in (17) (from Lasnik, 2001:306).

- (17) Speaker A: Mary will see someone.
Speaker B: Who [~~Mary will see t~~]?

It is quite curious that studies of sluicing in the literature have largely ignored exclamatives. Not surprisingly, sluicing is applicable in exclamatives, as shown in (18) and (19).

- (18) John wrote an extremely long paper, and it's unbelievable what a long paper ~~John wrote t~~.
(19) Speaker A: Colin just got a \$5000 computer for a Research Assistant.
Speaker B: What an expensive computer ~~Colin just got t for a Research Assistant!~~

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- b. To which crook did he lend his house?

We will not discuss these phenomena in this paper.

(18) and (19) show that exclamative sluicing is permitted both in the matrix and embedded contexts. It is also worth noting that exclamative sluicing, like interrogative sluicing, seems to display amelioration of island effects. Both in embedded interrogatives such as (20) (from Ross, 1969:276) and in embedded exclamatives such as (21), the effect of relative clause islands disappears when sluicing destroys “evidence” of the island violation.⁵

- (20) She kissed a man who bit one of my friends, but ...
- a. * ...Tom does not realize which one of my friends [she kissed a man who bit t]?
 - b. ...Tom does not realize which one of my friends [~~she kissed a man who bit t~~]?
- (21) John met a carpenter who built an extremely cute table, and ...
- a. * ...it’s unbelievable what a cute table [John met a carpenter who built t].
 - b. ...it’s unbelievable what a cute table [~~John met a carpenter who built t~~].

The amelioration effect further confirms that exclamatives are not different from interrogatives with respect to sluicing. In the next section, we introduce P&T’s (2001) novel analysis of wh-exclamatives and see what the facts seen above tell us about their analysis.

2 Pesetsky and Torrego’s Analysis and Its Problems

2.1 P&T’s Theory As briefly mentioned in the introduction, P&T propose an analysis in which wh-interrogatives and wh-exclamatives share the same syntax. More specifically, they claim that the feature specification of “interrogative C” is identical with that of “exclamative C”. The obvious semantic difference, i.e. that they are different in clause type, comes from an interpretive rule: a wh-clause is interpreted by the rule as either wh-exclamative or wh-interrogative, based on what structure the LF of the wh-clause has. The assumptions made concerning the content of C and nominative Case are as listed in (22).

(22) *P&T’s core proposal:*

⁵ Here we are simplifying a matter concerning relative clause island repair. Merchant (2001: chapter 5) argues that relative clause islands cannot be repaired. According to his claim, the source for (21b) would be *it’s unbelievable what a cute table [he built]*, which does not involve a relative clause. Let us make a few comments on this. First, Lasnik (2005) convincingly shows that relative clause islands can be repaired by Sluicing by looking at cases where the “short” reading of the elided site is impossible. Second, as will be discussed in section 3.2, the “source” issue is orthogonal to the major point we will make. For us, all that matters is that the material preceded by *unbelievable* in (21b) has the structure [_{CP} wh- C [_{TP} ...]]. That is, it is important to us that when a non-subject undergoes wh-movement, the non-wh subject of the clause stays inside the TP, i.e. the target of ellipsis.

- a. Matrix wh-CPs: C^0 bears $[uWh(+EPP)]$ and $[uT(+EPP)]$
- b. Embedded finite wh-CPs: C^0 bears $[uWh(+EPP)]$ and $[uT(-EPP)]$
- c. Nominative Case on nominals = $[uT]$

First, C of matrix wh-clauses bears an uninterpretable wh-feature ($[uWh]$) and an uninterpretable Tense feature ($[uT]$). Both features are marked for the property (+/-EPP). A feature F's being (+EPP) means that F in the attracting head has to be checked by overt movement of an element that has a matching feature. For instance, $[uWh(+EPP)]$ and $[uT(+EPP)]$ must be deleted via overt wh-movement and overt movement of T^0 , respectively. (22)a is intended to capture the fact that wh-movement and T-to-C movement are required in examples like *who will you see?*. (22)b, where $[uT]$ is marked (-EPP), requires that the feature checking in question be performed with the attractee in-situ. The second part of (22)b therefore ensures that T-to-C movement does not take place in cases like *Mary wonders who you will see*.

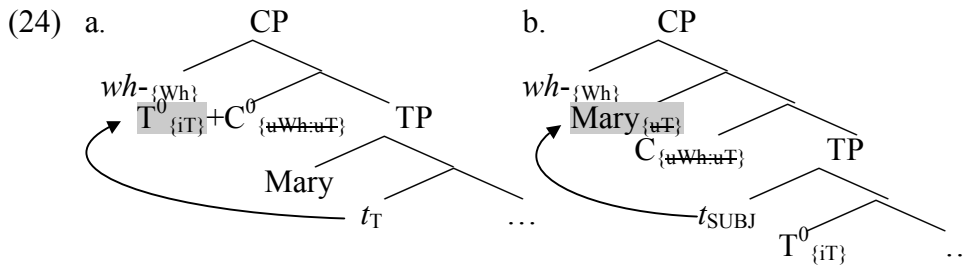
Let us turn to (22)c. This proposal amounts to saying that what we normally think of as nominative Case feature checking executed by Infl/T is in fact an instance of Tense feature checking. Note that (22)a and (22)c have an interesting consequence. (Note also that they assume that $[uT]$ in the subject DP is visible until the minimal CP phase is completed, even if it is checked once.) Namely, checking of $[uT(+EPP)]$ in C^0 can be executed either (i) by movement of T^0 (bearing an interpretable Tense feature ($[iT]$)) or (ii) by movement of the local subject (bearing $[uT]$).⁶ A possibility then arises that when a wh-phrase has $[uWh]$ and $[uT]$ (=nominative Case), the features in C^0 ($[uWh(+EPP)]$ and $[uT(+EPP)]$) are checked just through one operation, i.e. movement of the wh-DP to Spec-CP. Given their economy condition that requires maximization of the effect of an operation, the derivation involving both movement of T^0 and movement of the wh-phrase is blocked by the one involving only wh-movement, even though the former derivation is also convergent. This nicely explains why T-to-C movement does not take place in this case (cf. (14)), assuming that the lack of *do*-support entails the lack of T-to-C movement.

Having seen the core idea of P&T, let us see their treatment of wh-exclamatives. In their analysis, wh-exclamatives are a consequence of their assumption about nominative Case. Suppose we have (23), where C^0 has $[uWh(+EPP)]$ and $[uT(+EPP)]$. (For simplicity, we represent *is* as T^0) Note that there are two different continuations from (23). While $[uWh]$ must be checked by movement of *how tall* in both instances, checking of $[uT]$ in C^0 may take place in two ways. One way is that it can be checked by T-to-C movement. This gives us

⁶ In order to instantiate this optionality, they propose a particular theory of Minimality, in which the DP in Spec-TP and T^0 count as equidistant from C^0 . For the specifics of the proposal, see Pesetsky and Torrego (2001: 361-64).

the wh-clause [*how tall is Mary t_{is}*], as in (24)a. Alternatively, the [*uT*] can be checked by movement of the local subject *Mary*, providing the wh-clause [*how tall Mary is*], as in (24)b.

(23) [_{CP} C [_{TP} Mary [_T is] how tall]]



P&T's system thus allows T⁰ to stay in-situ even in a matrix wh-clause ((22)c). The fact that (24)b is derived may look like a bad result because T-to-C is required for the matrix question sentence *how tall is Mary?*. They claim, however, that (24)b surfaces as an exclamative sentence. To get this result, they propose the following interpretive rule (25) (adapted from P&T's (45)).

(25) A wh-CP is interpreted as exclamative if it has a non-wh element in Spec-CP, and is otherwise interpreted as interrogative.

According to this rule, (24)b, [*how tall Mary is*], is interpreted as exclamative because a non-wh-phrase *Mary*, as well as the wh-phrase, is found in the CP domain. (24)a, on the other hand, is interpreted as interrogative since the wh-phrase is the sole specifier of the CP. As P&T note, it is necessary for their analysis to have an extra semantic condition that correctly prevents, for example, *what a long NP* from occurring in interrogatives or *whether* from occurring in exclamatives. It looks plausible that semantics (and/or pragmatics) is responsible for determining what wh-phrase can occur in which wh-clauses (footnote 4). Given these assumptions, the fact that the theory allows for both (24)a and (24)b leads to the interesting claim that “C_[uWh;uT]” underlies both matrix wh-interrogatives and wh-exclamatives. Then the theory can give an answer to the question as to why it is not that both wh-interrogatives and wh-exclamatives display the effect of T-to-C or why it is not that wh-exclamatives, rather than wh-interrogatives, involve T-to-C. The interpretive rule (25) excludes these possibilities. By contrast, an approach that allows two different wh-Cs to exist would have to say that the actual distribution of T-to-C movement is totally accidental.

2.2 Problems P&T's analysis suffers from some empirical facts. First, it

wrongly predicts that there is no such a thing as embedded exclamatives. In their analysis, C of embedded wh-clauses bears [$uT(-EPP)$], not [$uT(+EPP)$]. This feature specification is motivated by the fact that there is no *do*-support or subject-auxiliary inversion in the embedded interrogatives, as in (26). Overt movement of T is claimed not to take place because since [$uT(-EPP)$] in C^0 can be checked through long distance agreement between C^0 and T^0 (Pesetsky and Torrego, 2001:380).

- (26) a. Bill asked what Mary bought.
 b. *Bill asked what did Mary buy.

The problem is that since [$uT(-EPP)$] in C^0 now does not attract anything overtly, the subject of the embedded clause never raises to Spec-CP, as illustrated in (27).

- (27) $\forall [_{CP} \textit{wh-} C^0 \{uWh(+EPP); uT(-EPP)\} [_{TP} \textit{SUBJ} T^0 \dots$
 └─ to be checked under Agree (with T^0 in-situ)

Under P&T's interpretive rule (25), there should be no chance to yield exclamatives here since a wh-clause has to have a non-wh-phrase (i.e., the subject) in the CP domain in order to make the CP exclamative. In reality, however, embedded exclamatives are possible, as we have already seen in (15)b, repeated in (28).

- (28) I'm surprised at how very fast John can run.

The second empirical problem that arises with P&T's analysis is also related to the proposed subject raising to a Spec-CP in exclamatives. Given that sluicing is an instance of TP ellipsis, P&T's interpretive rule (25) may imply that the subject of the wh-clause should be a sluicing remnant in exclamative sluicing.⁷ Consider for instance (19), repeated below as (29). The structure of

⁷ To be more explicit, (25) does have this implication, if [$uT(+EPP)$] in C requires that (a copy of) the phonologically non-null element probed by C be merged in the local domain of the C (e.g. Spec-CP). The subject *Colin* in (30) must be pronounced in Spec-CP in order to satisfy both the EPP and the condition for exclamative interpretation at the same time. It could be true that (25) does not predict that the subject should be a remnant in exclamative sluicing under other views of the EPP. We briefly consider the version of "EPP" proposed by Lasnik (1999b). Lasnik argues, building on the idea of Ochi (1999), that for head movement, a violation caused by failure to license the strong feature of an attracting head is marked on the attracted element, rather than the attractor, and that the nature of such a violation is phonological. Lasnik proposes that this inadequacy of the unmoved category can be repaired either by movement of the whole category to the target position or by deletion of part of the structure containing that category. If we apply this conception of feature strength to the EPP property of [uT], a different story can be told. Under this

speaker B's utterance would have to be analyzed in the way represented in (30) if (25) is correct. It is obviously not correct, as seen in (31).

- (29) Speaker A: Colin just got a \$5000 computer for a Research Assistant.
 Speaker B: What an expensive computer ~~Colin just got *t* for a Research Assistant!~~
- (30) [_{CP} [what an expensive computer]₁ [_C Colin₂ C [_{TP} ~~*t*₂ just got *t*₁ for a Research Assistant~~]]]!
- (31) Speaker B: *What an expensive computer Colin ~~just got *t* for a Research Assistant!~~

It is easy to see that embedded exclamative sluicing, which we have seen is possible in the previous section, poses the same problem, as repeated in (32).

- (32) John wrote an extremely long paper, and ...
 a. it's amazing what a long paper [~~TP John wrote *t*~~].
 b. * it's amazing what a long paper John [~~TP *t* wrote *t*~~].

(Here we are abstracting away from an observation we made above, i.e. that P&T's analysis predicts the impossibility of embedded exclamatives.)

Finally, recall that P&T's rule (25) says that when a non-wh-phrase is found in a Spec-CP, that CP is interpreted as exclamative. We agree with P&T that some interpretive rule is needed to differentiate between exclamatives and interrogatives. However, it is not clear why the interpretive rule should be stated

approach, [_{uT}(+EPP)] is satisfied by feature movement followed by PF deletion of the TP. Interestingly, there is a fact suggesting that [_{uT}(+EPP)] in C can be satisfied in this manner, as Lasnik observes. Consider (i):

- (i) Speaker A: John will call someone.
 Speaker B: Who C [~~TP John will call~~]? (cf. *Who will John call?)

The auxiliary *will* does not overtly move, but sluicing appears to repair the problem caused by movement of FF(*will*) to the moving element. See chapters 6 and 7 of Lasnik (2003) for issues involving matrix sluicing.

Let us now consider the derivation in (ii), which differs minimally from (30):

- (ii) [_{CP} [what an expensive computer]₁ [_C C [_{TP} ~~Colin just got *t*₁ for a Research Assistant~~]]]!

C's [_{uT}(+EPP)] should be satisfied in the theory under consideration just as it is in (i). The issue is then narrowed down to whether the CP in (ii) meets the condition on exclamative interpretation, i.e. (25). Note that the Tense feature of the subject, which is moved to C in (ii) in the theory under discussion, is uninterpretable. It becomes invisible after checking. Hence it is not likely for that feature to play a role at the level where the interpretive rule applies. Since no feature that originates from a "non-wh element" may appear in the local domain of C at LF, there seems to be no possibility that (25) interprets (ii) as exclamative, unless the relevant feature is pied-pied with [_{uT}]; see Lasnik (1999a) for arguments against such feature pied-piping, based on *there*-constructions. This alternative theory of EPP thus does not seem to help to get around the problem posed by exclamative sluicing for P&T's analysis of wh-exclamatives.

in the way that (25) is stated. In other words, why is it the case that the presence of a non-wh-phrase in the lower specifier of CP, not other structural properties, should play a key role? What is the reason that semantics does not interpret the CP with multiple specifiers, rather than the one with a single specifier, as interrogative? These kinds of questions seem to suggest that the rule needs be reconsidered to the extent that we could not find a satisfactory answer to these questions.

In summary, P&T's approach to wh-clauses certainly has the virtue of explaining complementarity between the distribution of wh-exclamatives and interrogatives. But the embeddability of exclamatives, the availability of sluicing under exclamatives and the unclear nature of their interpretive rule seem to require modification.

3 A New Account

3.1 Proposal Our proposal is embedded in the following set of key assumptions, some of which we borrow from P&T and some of which we propose here. Let us examine them in turn.

- (33) a. C^0 in wh-interrogatives and C^0 in wh-exclamatives are the same. In particular, they bear [$uWh(+EPP)$] and [$uT(+EPP)$] when they appear in the matrix clause while they bear [$uWh(+EPP)$] and [$uT(-EPP)$] when embedded.
- b. Factive Operator Op_{FACT} bears [uT] and thereby it can be merged into CP-domain.
- c. Interpretive rule: Interpret a wh-clause as exclamative if the factive Operator, Op_{FACT} , is in Spec-CP, otherwise interpret it as interrogative (see footnote 10).
- d. Merge preempts Move.
- e. Nominative DPs do not bear [uT].

We follow P&T in claiming that “exclamative C” and “interrogative C” have the same feature specification, as in (33)a, and that an interpretive rule determines whether an instance of wh-clause is exclamative or interrogative, depending on the syntactic form the CP has, though our (33)c differs from P&T's rule (25). (33)b and (33)c essentially argue in favor of Zanuttini and Portner's (2003) position, according to which exclamatives, unlike interrogatives, are inherently factive and the former involve some factive morpheme in its syntax.⁸ Recall our discussion about P&T's interpretive rule (25) in the previous section. While the

⁸ We will not discuss the semantics and pragmatics of exclamatives in detail, but see section 5 for some discussion. For factivity of the construction, the reader is referred to Zanuttini and Portner (2003). See also Fitzpatrick (2005) for relevant discussion.

nature of rule (25) is not immediately clear, our proposal in (33)c seems to be more well-motivated on semantic grounds. We will return to this in the last section of the paper. Also, as in (33)b, we assume that the factive operator in question bears [*u*T] and that, as required by (33)d (proposed by Chomsky, 1995; 2000), if Merge is an available option, the option is preferred over Move. Finally, as we will see in section 3.2, we have to drop the “Nominative Case = Tense feature” assumption. In the subsections that follow, we will see how these assumptions allow us to account for the data.

3.2 Matrix *Wh*-CP: when C^0 bears *uWh*(+EPP) and *uT*(+EPP) As stated in (33)a, we are assuming with P&T that the matrix *wh*- C^0 has [*uWh*(+EPP)] and [*uT*(+EPP)]. Let us first consider a case in which the subject is a *wh*-phrase and the numeration contains Op_{FACT} . Suppose the derivation reaches a point where *C* is introduced, we arrive at (34).

(34) [_{CP} $C^0_{[uWh, uT]}$ [_{TP} *wh*-_[uWh] $T_{[iT]}$ [_{VP} *V* ...]]]

Since Op_{FACT} has [*uT*] (cf. (33)b), and since Merge must apply when Merge and Move are both possible (cf. (33)d), the next step must be merger of Op_{FACT} . The merger of the operator thus leads to checking of [*uT*(+EPP)] in *C*.⁹ Importantly, Merge(Op_{FACT}, C) preempts T-to-*C* movement. Then, movement of the subject *wh*-phrase applies, and [*uWh*(+EPP)] in *C* is deleted. A structure of the following kind is yielded:

(35) [_{CP} *wh*-_[uWh] [_{C'} $Op_{[uT]}$ $C^0_{[uWh, uT]}$ [_{TP} *t*_{wh}- $T_{[iT]}$ [_{VP} *V* ...]]]]

Now the interpretive rule ((33)c) interprets (35) as exclamative since the operator resides in a Spec-CP. No significant difference arises between when the *wh*-phrase starts from the local-subject position and when it starts from other positions. The derivation of the latter cases proceeds in the same way as (35). In a nutshell, when Op_{FACT} is present in the numeration, the CP in question ends up being interpreted as exclamative.¹⁰

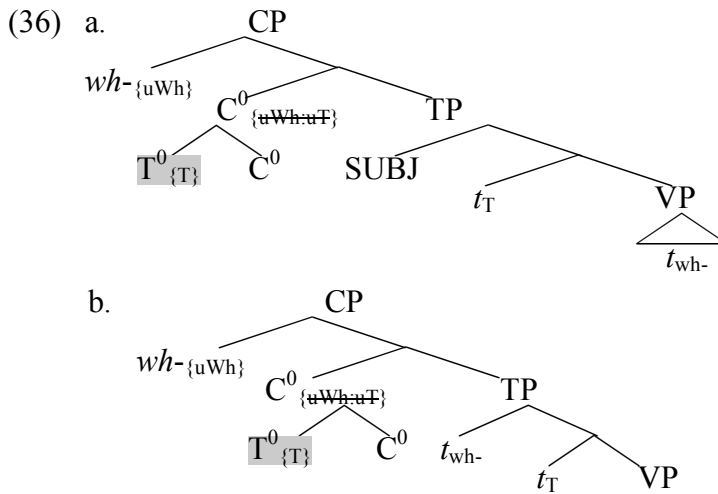
⁹ We assume that Merge that is not part of Move is free in the sense that the operation can be performed without feature checking. We also assume that when [*uT*] in *C* is checked by the operator, the operator probes the relevant feature, just as expletives probe *T* to have their uninterpretable feature checked, as proposed in Chomsky (2000: 128). See Ko (in press) for a similar suggestion for *why*, which is assumed to be directly merged into Spec-CP (Rizzi, 1990).

¹⁰ Stacey Conroy correctly points out (personal communication) that our interpretive rule might make a wrong prediction for *how come* interrogatives like (i):

(i) How come Stacey likes dogs?

The reasoning is as follows: As argued by Fitzpatrick (2005) and Conroy (this volume), *how come* interrogatives, unlike other *wh*-interrogatives, involve factivity. Let us say that this is correct and

Next, let us consider the case in which Op_{FACT} is not present in the numeration. Since C^0 bears $[uWh(+EPP)]$ and $[uT(+EPP)]$, two kinds of overt movement are required: Wh-movement and T-to-C movement. This is where assumption (33)e matters: It says that nominative Case is not $[uT]$, contra P&T. Under this assumption, $[uT]$ in C can be satisfied only by raising of T^0 to C^0 . Namely, whether the moving wh-phrase originates in local subject position or not, T-to-C movement must take place in the absence of Op_{FACT} , i.e. in questions. (36)a, where a non-subject wh-moves, and (36)b, where the subject wh-moves, illustrate this:



Putting aside for the moment the absence of *do*-support in an example like *who left?*, (33)c dictates that the LF representation derived from either (36)a or (36)b be interpreted as interrogative since no Op_{FACT} is involved in these derivations. Given the discussion so far, it should be clear now that the proposed system predicts that matrix wh-exclamatives never involve T-to-C movement while matrix wh-interrogative must. The following contrast between exclamatives and

that *how come* interrogatives are analyzed to be a CP one of whose specifiers is filled with Op_{FACT} . Then the fact that *how come* interrogatives do not exhibit subject-auxiliary inversion or *do*-support follows from our assumptions (For other analyses of this fact, see references cited in Conroy's paper). The problem here is that our interpretive rule wrongly predicts that *how come* sentences must be interpreted as exclamative. We do not have a good solution to this problem. One other thing that might be worth noting here has to do with multiple wh-constructions. Conroy (this volume) observes that multiple interrogation is generally poor with *how come* (e.g. **how come Joe ate what?*) and suggests that this fact may be tied with factivity because non-*how come* multiple interrogation is poor also when wh-in-situ is embedded under factive predicates. Since, as mentioned in footnote 4, multiple wh-exclamatives display difficulty in English, we may say that wh-in-situ is disallowed in the scope of the factive operator (see also footnote 15; we are setting aside languages like Japanese where wh-in-situ is apparently allowed in exclamatives).

interrogatives then follows. ((37), repeated from (8))

- (37) a. What a big house he lives in!
b. *What a big house does he live in!
- (38) a. *Which house he lives in?
b. Which house does he live in?

In (37), T-to-C movement is blocked by merger of Op_{FACT}, while in (38) there is no operator of that sort in the numeration.

Recall that while P&T's analysis accounts for these contrasts, it runs into a problem in accounting for sluicing examples such as (19) (repeated in (39)).

- (39) Speaker A: Colin just got a \$5000 computer for a Research Assistant.
Speaker B: What an expensive computer ~~Colin just got t for a Research Assistant!~~

According to P&T, the subject of wh-exclamatives should be located in the inner Spec-CP. The fact that *Colin* is contained in the sluiced site in (39) is then not expected if sluicing involves TP-ellipsis. This problem does not arise in the alternative we are proposing because the subject stays in Spec-TP in exclamatives. It is the factive operator that occupies the inner specifier.

Now let us go back to the lack of *do*-support observed in wh-subject interrogatives such as *who ate an apple?*. As evident from (36)b, our assumptions require that T-to-C movement take place in matrix wh-interrogatives. Does this mean that we incorrectly predict (40)a to be ungrammatical and (40)b to be grammatical? No, it does not necessarily.

- (40) a. Who ate an apple?
b. *Who did eat an apple? (on non-emphatic reading)

We can account for this contrast by adopting Chomsky's (1957) analysis of subject wh-questions such as (40)a; See Bobaljik, 1995: Chapter 2 for a minimalist version of it. Cf. also Lasnik, 1995. Given our (and P&T's) feature specification of matrix wh-C ((33)a), (40)a involves T-to-C movement, as in (41).

- (41) Who [_C T⁰_{PAST+C}] [_{TP} t_{who} t_T eat an apple]

According to a *Syntactic Structures*-style account, the T⁰ that has been raised to C⁰ undergoes Affix Hopping, which can be taken to be a morphological merger applying under adjacency. The past tense affix is adjacent to the lexical verb *eat*, given the assumption that traces are invisible for the present purposes (cf. *What*

did John eat?, where the subject blocks adjacency). Under this approach, Affix Hopping “undoes” the effect of T-to-C movement in this case, as Chomsky (1957: 70) observes. We thus depart from P&T’s factual assumption that sentences such as *who ate an apple?* do not involve T-to-C movement, which allows us to maintain our unified account of matrix wh-exclamatives and wh-interrogatives.¹¹

3.3 Embedded Wh-CP: when C bears $uWh(+EPP)$ and $uT(-EPP)$ Having looked at matrix wh-clauses, let us turn to embedded wh-clauses. The embedded wh-C bears [$uWh(+EPP)$] and [$uT(-EPP)$], as we have been assuming with P&T. A problem with P&T was that their theory incorrectly predicts that exclamatives cannot be embedded, since the embedded C, being (-EPP), does not attract the local subject of the clause and thereby no exclamative interpretation would be available (cf. (25)). The embeddability of exclamatives poses no problem for the present approach. When Op_{FACT} is present in the numeration, the outer and the inner specifiers of C are filled with a wh-phrase and Op_{FACT} , respectively, as in (42):

(42) ... V [_{CP} wh-_[uWh]] [_C Op_{FACT} _[uT] C_[uWh,uT]] [_{TP} ...

Unlike the case of matrix wh-clauses that we discussed above, [uT] in C here is specified for (-EPP). Then when T is introduced into the derivation, two options are available: Agree(C, T) and Merge(Op_{FACT} , C). If the former applies, Op_{FACT} is left in the numeration, which keeps the derivation from converging. If, on the other hand, Op_{FACT} is merged with C, then [uT] in C and the matching feature of Op_{FACT} enters into a checking relation (see footnote 9.) Note that merger of Op_{FACT} is performed earlier than wh-movement. The Merge-over-Move assumption ((33)d) forces merger of Op_{FACT} to apply before movement of wh-. Finally, the resulting CP receives an exclamative interpretation because of the presence of Op_{FACT} in the structure, according to the interpretive rule (33)c. In other words, embedded exclamatives are predicted to be possible under our approach, and they are, as shown in (43) (repeated from (15)b).

¹¹ *Wanna* contraction may raise a question concerning the validity of the assumption that traces are invisible for morphological merger.

- (i) a. Do you {want to/wanna} eat an apple?
 b. Who do you {want to/*wanna} eat an apple?

The standard analysis of the contrast above is that Case-marked traces, unlike other empty categories, block contraction (see Boeckx, 2000 and references cited therein). If *wanna* contraction and Affix Hopping obey the same kind of adjacency requirement, then we are faced with a puzzle: why the Case-marked trace in (41) does not intervene. We have not been able to determine the severity of this puzzle since we do not know whether these two processes are subject to the same condition. Thanks are due to Howard Lasnik for drawing this issue to our attention.

(43) I'm surprised at how very fast John can run.

Moreover, embedded exclamative sluicing such as (44) (repeated from (18)) receives a natural account under our operator analysis. (45) represents the structure of the complement clause of the second sentence in (44) to which sluicing applies.

(44) John wrote an extremely long paper, and it's unbelievable what a long paper
~~John wrote *t*.~~

(45) ... [CP what a long paper [C' Op [C' C [TP ~~John wrote *t*]]]]~~

Thus sluicing in embedded exclamatives also argues in favor of our operator analysis of exclamatives over P&T's analysis.

Let us briefly see what happens when Op_{FACT} is not in the numeration. Because there is no operator, Agree(C,T) satisfies [*u*T] in C⁰. No T-to-C movement applies since [*u*T] is marked (-EPP). (46) is then yielded, which the interpretive rule correctly interprets to be associated with interrogation.

(46) ... V [CP *wh*- [C' C_{[EPP]] [TP ... T_{[iT]] V ...}]}

In sum, our assumptions given in (33) correctly account for the embedded phenomena that are potentially problematic for P&T's analysis. In particular, embeddability of *wh*-exclamatives is correctly expected, as well as the possibility of sluicing in embedded contexts. Our approach covers a wider range of data than P&T's does while maintaining the conceptual advantage of their analysis of *wh*-clauses, i.e., being able to give an account for why *wh*-exclamatives and *wh*-interrogatives are in complementary distribution.

4 Some Other Differences between the Two Types of *Wh*-clauses

4.1 Exclamative Infinitives This section discusses a hitherto-unnoticed difference between *wh*-interrogatives and *wh*-exclamatives; that is, the latter cannot be embedded infinitives as in (47) and (49), whereas the former can be, as in (48) and (50).

(47) a. *I'm shocked (at) what a lot of paperwork to have finished.

b. I'm shocked (at) what a lot of paperwork I should have finished.

(48) a. John wonders which paperwork to finish.

b. John wonders which paperwork he should finish.

(49) a. *We are surprised (at) what a long paper to have read for Mary's class.

b. We are surprised (at) what a long paper we should have read for Mary's

- class.
- (50) a. We asked which paper to read for Mary's class.
 b. We asked which paper we should read for Mary's class.

Here we would like to provide a possible account for this contrast. To approach the issue here, let us review Landau's (2000, 2004) work on infinitive complements. (Note that Landau 2000 and Landau 2004 differ in some of the specifics and that the assumptions we will make below are not identical to his.) Landau, building on the idea originated from Stowell (1982) among others, claims that infinitive complements including factive and interrogative ones have their own tense operator (as opposed to implicative, modal and aspectual infinitive complements; see Landau (2000; 2004) for details). The examples in (51) show that factive predicates impose a restriction on the interpretation of their infinitival complement in such a way that the time of the event denoted by the embedded clause must precede the time of the matrix event (often called "realis"; see Pesetsky 1992). As indicated by temporal modifiers such as *today* or *yesterday*, the time of the matrix event and that of the embedded event is fixed. Interrogative infinitives also exhibit a similar interpretive constraint. As in (52) (adapted from Landau, 2000:58), the required temporal order of the two events in the interrogative construction is different from the one we find in the factive construction: the time of John's wondering must be *before* the time of his solving a problem (often called "irrealis"; desiderative infinitives also fall under this class; e.g. *John wants to win*).

- (51) *Factive infinitive = realis*
 a. Today, John was glad to have finished his homework yesterday.
 b. *Yesterday, John was glad to finish his homework tomorrow.
- (52) *Interrogative infinitive = irrealis*
 a. *John wonders what problem to have solved yesterday.
 b. Yesterday, John wondered what problem to solve tomorrow.

The difference between interrogative and factive infinitives is not so important to us. What matters to us is that we do not find a restriction of either sort in finite complements, as Landau notes. The b-examples in (53) and (54) contrast with those in (51) and (52), respectively.

- (53) a. Today, John was glad that he had finished his homework yesterday.
 b. Yesterday, John was glad that he could finish his homework tomorrow.
- (54) a. John wonders what problem he should have solved yesterday.
 b. Yesterday, John wondered what problem he should solve tomorrow.

- (57) a. *I'm shocked (at) [_{CP} *wh*- [_{C'} Op_[uT] C_[uT] [_{TP} PRO T ...
└──────────┘ (T-to-C)
- b. John wonders [_{CP} *wh*- T+C [_{TP} PRO t_T ...
└──────────┘ (T-to-C)

Thus, embedded questions such as (56)b are correctly predicted to be grammatical.

We finally would like to mention P&T's interesting proposal about irrealis/realis infinitives, which can account for the set of facts we discussed above when combined with our assumption about Op_{FACT} and our interpretive rule. Unlike us, P&T make a distinction between irrealis and realis infinitives. For them, as opposed to the C of irrealis clauses, the C of realis clauses lacks [*u*T], which means that no T-to-C movement takes place in the latter (p.397).¹² Since Op_{FACT} has no element that it can check its [*u*T] against, the lack of [*u*T] in C of irrealis leads the derivation to crash whenever the operator is present in the numeration. If we combine this with our interpretive rule, we predict that no infinitival exclamatives can surface. We will not choose between the two alternatives concerning whether C of irrealis has [*u*T] or not, but we hope we have shown that parts of our proposal, the operator analysis and our interpretive rule, are useful to account for the data.¹³

4.2 A Subject/Non-subject Asymmetry One other difference between the two *wh*-clauses at issue has to do with a subject/non-subject asymmetry. As noted by Nelson (1997), who attributes the observation to Jane Grimshaw, the local subject can be questioned in interrogatives but cannot be exclaimed over in exclamatives (see also P&T for relevant discussion). The following pair is Nelson's 1997 (7b/8b), with her judgments in parentheses.

- (58) a. (✓)What a strange woman Bob dances with!
 b. (*)What a strange woman dances with Bob!

As P&T noted, their interpretive rule (25) excludes (58)b because there is no

¹² In fact P&T's original system may handle the unacceptability of (56)a, because the C of realis clauses lacks [*u*T]. Recall however that P&T's system fails to account for embedded finite exclamatives, as we showed in section 0. To show that their particular proposal about irrealis infinitives is a possibility that we could adopt, we combine it with some of our assumptions, which are not made in their paper. See, though, Landau (2000, 64, fn.31) for a criticism of P&T's approach to irrealis infinitives.

¹³ Our account is not compatible with on the "valuation" theory of feature checking (cf. Chomsky, 2000; 2001). If [*u*T] in C⁰ always needs to be valued by [*i*T] in T⁰ via Agree(C,T), then the merger of Op_{FACT} does not help to differentiate factive infinitives from interrogative ones.

non-wh-phrase in the inner Spec-CP and therefore the sentence cannot be interpreted as exclamative. Nothing in our assumptions excludes that example, which appears to be a problem for the proposed analysis. In what follows, we will argue that a closer look at the phenomenon at issue reveals that the argument for their position based on this fact is not robust. First, there might be a dialectal variation with respect to the acceptability of examples like (58)b. Some of the speakers we consulted do report the judgments about this type of pairs in the direction indicated in (58), but some of them do not. For the latter group, both types of examples are acceptable: There is no subject/non-subject asymmetry. (See Radford, 2000, who presents some subject wh-exclamative examples that are reported to be acceptable.) Under P&T's theory, the judgment from the speakers who allow wh-subjects to be exclaimed over cannot be accounted for. Thus, both the present approach and P&T's fail to account for the dialectal variation in question if any. Second, as noted by Nelson (1997) and by Pesetsky and Torrego (2001: 377; 411, fn.40) there is a contrast between when the predicate is unergative, as in (58)b and when the predicate is unaccusative, as in (59). The observation is made that unergative subject wh-exclamatives are worse than unaccusative ones.

- (59) a. What a lot of women came to the party!
 b. What huge bees are buzzing in the garden! (Nelson 1997, (10)a/b)

Neither P&T's analysis nor ours expects this contrast. Finally, consider the following example.

- (60) a. (✓)What a strange woman you said Bob danced with!
 b. (*)What a strange woman you said danced with Bob!

What we found is that those who reject (58)b reject (60)b as well. In other words, embedding the clause containing wh-subject does not help improve the status of subject wh-movement. This is a potential problem for P&T's analysis, since their (25) makes the sharp prediction that (60)b is better than (58)b, where the matrix subject *you* should be able to raise to Spec-CP, yielding an wh-exclamative clause. For us, embedding should not make any difference, though we do not expect (60)b to be degraded either. The parallelism between (58) and (60), however, seems to suggest that P&T's approach to the contrast in (58) is not on the right track.

5 Conclusion

In sum, this paper began by pointing out that Pesetsky and Torrego's suggestion that the same feature specification applies to both the C of wh-interrogatives and

the C of wh-exclamatives helps open a way to a principled account of lack of subject-auxiliary inversion/*do*-support in wh-exclamatives in English. We proposed an operator-based analysis of wh-exclamatives and the interpretive rule according to which the existence of that operator in CP makes the clause interpreted as exclamative. It was shown that the combination of these nicely solves empirical difficulties that would arise with P&T's analysis of wh-exclamatives while keeping intact their core idea. The data having to do with embeddability of exclamatives and those having to do with sluicing can be accounted for under our approach.

Before closing the paper, let us return to our interpretive rule proposed in (33)c, repeated below for ease of reference.

- (61) Interpretive rule: Interpret a wh-clause as exclamative if factive Operator Op_{FACT} is in Spec-CP, otherwise interpret it as interrogative.

We asked in section 2 why the rule that differentiates between the two wh-constructions should be formulated in the way their rule is formulated. We should ask the same question for our (61). An answer comes from Zanuttini and Portner's (2003) proposal about the semantics of exclamatives. Zanuttini and Portner propose a "compositional" view of clause typing (e.g. asserting, asking, exclaiming or ordering), arguing that clause type should not be directly encoded into syntax. For them, the interrogative force and the exclamative force are neither syntactically nor semantically primitive. If so, it is not surprising at all that the interrogative force and the exclamative force share semantic properties. In fact, as they correctly observe, the denotation of interrogatives and that of exclamatives share one thing: both denote sets of propositions (see Hagstrom 2003 for an overview of the semantics of question). Zanuttini and Portner thus arrive at the following conclusion about the syntax of exclamatives: a sentence is an exclamative if (i) it contains a wh-operator-variable configuration *and* (ii) it contains an abstract morpheme FACT in the CP-domain. Property (i) contributes to the meaning of exclamatives in such a way that exclamative sentences denote sets of propositions. The second property, on the other hand, corresponds to the fact that exclamatives are factive in the sense that their propositional content is presupposed. They argue that property (ii) is the one that distinguishes exclamatives from interrogatives. It should be clear now that property (ii) is exactly what (61) is intended to mean. Given the assumption that Op_{FACT} comes with [*u*T], the lack of T-to-C movement in exclamatives and the impossibility of exclamative infinitives can be taken to be syntactic consequences of the way the semantics of exclamatives works. Finally, let us mention some questions that we have to leave unanswered. Although the assumption that Op_{FACT} bears [*u*T] helps us explain why wh-exclamatives, unlike wh-interrogatives, do not involve T-to-C

movement, one thing that is not clear to us at this point is what it means that the factive operator bears a Tense feature in English. Is there any reason why the operator bears the feature we claim it has? Could the operator have some other feature in some other language? If so, we might expect that merger of Op_{FACT} may compete with a process different than T-to-C movement.¹⁴ Also, there is a proposal that has been explored recently that we did not discuss: that exclamative CPs have a layered structure (see Zanuttini and Portner, 2003 on Paduan and Italian; Villalba, 2003 on Catalan; Ono, 2002 on Japanese). Although we have not found English-internal evidence for exclamative CPs having a layered CP, it seems to be worth considering how our core results can be recast in terms of that analysis.¹⁵ We have to leave these for future research.

¹⁴ It seems to be possible for us to treat French exclamatives in the same way as we treat English ones. In French, there is no subject-auxiliary inversion in wh-exclamatives. (i) is from Obenauer 1994, cited by Zanuttini and Portner 2003:

- (i) a. Quelle chance tu as eue!
 what luck you have had
 ‘What luck you’ve had!’
 b. * Quelle chance as-tu eue!
 what luck have-you had

On the other hand, languages like Spanish might raise a problem. In the Spanish wh-exclamative example given in (ii), subject-verb inversion is required as in wh-interrogatives (cf. Torrego 1984 for subject-verb inversion in interrogatives).

- (ii) Con qué hombre más extraño (*?Pedro) bailó (Pedro) ayer!
 with what man so strange Peter danced Peter yesterday
 ‘What a strange guy Peter danced with!’ (Ivan Ortega-Santos, p.c.)

However, what (ii) tells us heavily depends on the analysis of Spanish inversion. It is controversial whether T-to-C takes place in examples of this sort (see Suñer 1994 and references cited therein). Ivan Ortega-Santos points out that in Spanish, wh-exclamatives impose phonological emphasis on wh-phrases, as opposed to wh-interrogatives, and that this sort of phonological effect is observed with focus movement constructions as well (cf. Gutiérrez-Rexach 2001). In addition, Radford (2000) documents that subject auxiliary inversion in wh-exclamatives is optional in Elizabethan English. It requires further investigations to see what these facts would tell us.

¹⁵ Z&P argue, based on Paduan, that exclamative wh-phrases and interrogative ones are licensed by different C heads in the CP shell. Specifically, the fact that Paduan interrogatives license wh-in-situ but its exclamatives do not can be quite puzzling under our assumptions. We do not have much to say about it at this point, but it could be an interesting research topic to investigate this interrogative/exclamative asymmetry cross-linguistically. Even in English this asymmetry might hold if we take into consideration the so-called echo-question construction, a kind of interrogation with wh-in-situ. We never observe any wh-in-situ with exclamatives, however. It might be interesting to see what happens in French (Bošković and Lasnik, 1999) and Brazilian Portuguese (Jairo Nunes, personal communication), where in-situ wh-questions are allowed in certain (slightly different) environments. We would also like to note that wh-in-situ languages like Japanese seem to allow wh-in-situ with exclamatives; see footnotes 4 and 10.

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