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## Pied-piping in degree wh-clauses in Spanish

**Abstract:** This paper presents a novel analysis of (non)-pied-piping structures in degree wh-clauses with adjectives in Spanish based on the idea in Heck (2008, 2009) that optional pied-piping cannot exist. Under this assumption, it is argued that pied-piping and non-pied-piping structures in the constructions under study originate from two different structures: pied-piping structures obtain from a standard structural configuration in which the degree wh-form heads a functional phrase in the extended projection of the adjective, whereas the discontinuous structure with *cómo de* ‘how of’ ([*cómo* ... *de*+A]) results from a reanalysis process turning *de*+A into a verbal adjunct. This analysis is extended to related constructions both in Spanish and in other Romance languages, and some apparent counterexamples are also discussed.

**Keywords:** degree wh-clauses, pied-piping, reanalysis, Spanish, Romance languages

### 1. Introduction

Adjectival degree wh-expressions in wh-questions and wh-exclamatives take four different lexical forms in current Spanish: *cuán* ‘how much’, *qué tan* ‘what so’, *cómo de* ‘how of’, and *qué* ‘what’.<sup>1</sup> As shown in (1), *cuán*, *qué tan* and *cómo de* introduce both wh-questions and wh-exclamatives, whereas *qué* is restricted to wh-exclamatives:<sup>2</sup>

(1) a. ¡¿*Cuán*            *alta*   *es* *Ana*?!

          how much tall    is Ann

      b. ¡¿*Qué*    *tan*    *alta*   *es* *Ana*?!

          what so     tall    is Ann

      c. ¡¿*Cómo de* *alta*   *es* *Ana*?!

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<sup>1</sup> The adjectival degree wh-form *cuánto de* ‘how much of’ is also occasionally attested (see Section 4).

<sup>2</sup> The acceptability of pied-piping wh-exclamatives with *cómo de* (1c) seems to be subject to idiolectal variation, at least in European Spanish (see the different grammaticality judgments in Torrego, 1994: 264-65; Sánchez López, 2006: 49; and Octavio de Toledo and Sánchez López, 2009: 1046, 1052). For us, this construction is well-formed, particularly so with a heavy stress on *cómo*.

how of tall is Ann

‘How tall is Ann?/How tall Ann is!’

d. *¡Qué alta es Ana!*

how tall is Ann

‘How tall Ann is!’

The Old Spanish degree wh-word *cuán* ‘how much’ is a form of general Spanish nowadays, but is used in different registers across dialects: speakers of European Spanish see it as an archaic feature of formal language, while its use is much more pervasive in American Spanish. *Qué tan* ‘what so’ is also often documented in Old Spanish texts. This complex wh-expression was lost in European Spanish in the 18th century, but has been preserved in many varieties of American Spanish. *Cómo de* ‘how of’ originated in the 17th century, and is currently used both in European Spanish and in some varieties of American Spanish. As for exclamative-only *qué* ‘what’, this is the preferred form for adjectival wh-exclamatives in Spanish across the board.<sup>3</sup>

The examples in (1) also show that all Spanish degree wh-items pied-pipe the adjective.<sup>4</sup> However, only *cómo* ‘how’ can move alone to the sentential left-periphery, giving rise to a non-pied-piping (discontinuous) structure:<sup>5</sup>

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<sup>3</sup> On the history and current dialectal distribution of these wh-forms, see Sánchez López (2006), Octavio de Toledo and Sánchez López (2007, 2009), and Sánchez López and Octavio de Toledo (2010).

<sup>4</sup> In this work, we are adopting the definition of pied-piping in Horvath (2006), stating that pied-piping is “a phenomenon whereby some particular movement operation T, designated to displace an element A, in fact displaces additional elements together with A; more specifically, pied-piping is involved when an application of T ends up moving some constituent that properly contains A” (Horvath, 2006: 570).

<sup>5</sup> The patterns in (1)-(2) are replicated in embedded wh-questions and wh-exclamatives.

(2) a. \*¿{Cuán(to)/Qué tan(to)} es Ana alta?!

how much/what so is Ann tall

b. \*¿Qué es Ana alta!

what is Ann tall

c. ¿Cómo es Ana de alta?!

how is Ann of tall

In this paper, we will give a new account of (non)-pied-piping structures in adjectival degree wh-questions and wh-exclamatives in Spanish. Under the assumption that optional pied-piping does not exist (Pérez Ocón, 2007; Heck, 2008, 2009), we will argue, in a nutshell, that the pied-piping and non-pied-piping wh-clauses in (1) and (2) have their source in two different structures. We will propose, in particular, that the pied-piping structures in (1) underly a structural configuration in which the degree wh-form is the head of a functional phrase in the extended projection of the adjective, whereas the non-pied-piping structure with *cómo de* in (2c) obtains from a reanalysis operation whereby *de+A* becomes a verbal adjunct.

The content of the paper is organized as follows. In Section 2, we will first critically discuss two previous analyses of the patterns illustrated above. In Sections 3, we will present our proposal in detail. In Section 4, we will extend it to related constructions both in Spanish and in other Romance languages, also dealing with apparent counterexamples. Section 5 finally contains the conclusions of our research.

## 2. Previous analyses: a critical review

To the best of our knowledge, two different analyses of pied-piping and non-pied-piping wh-clauses with *cómo de* ‘how of’, like those in (3), can be found in the literature:

(3) a. ¿*Cómo de alta es Ana?*

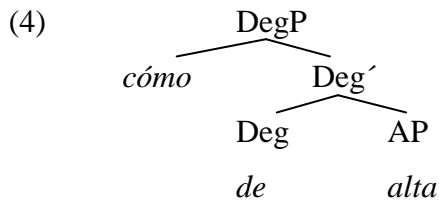
how of tall is Ann

b. ¿*Cómo es Ana de alta?*

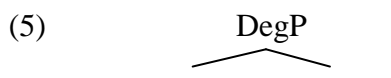
how is Ann of tall

‘How tall is Ann?’

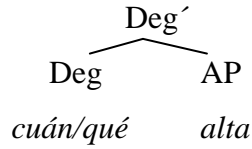
As depicted in (4), Morón Pastor (2004) first claims that *cómo* is generated as a maximal projection in the specifier position of a DegP headed by *de*, which he takes to be both a partitive Case marker and a degree operator, and proposes that, in order to check its wh-feature, it optionally moves alone to the CP domain or pied-pipes *de+A*, giving rise to the discontinuous and pied-piping structures in (3b) and (3a).<sup>6</sup>



Morón Pastor further argues that *cuán* and exclamative *qué* are inserted under Deg<sup>0</sup> (5). Therefore, unlike *cómo*, *cuán* and *qué* obligatorily pied-pipe the adjective (see the examples in (1) and (2)), since movement of these wh-words alone would involve extraction of an X<sup>0</sup> to the specifier position of CP, violating the Structure-Preserving Condition on substitution operations (Chomsky, 1986).



<sup>6</sup> The idea that *cómo* in [*cómo de+A*] is subject to optional pied-piping was first suggested in Rivero (1980).



The proposal in Morón Pastor (2004) has a number of problems. First, *de* in [*cómo de*+A] could well be analyzed as a Case marker (see Section 3.2), but the idea that it is a degree operator does not seem to be well-founded, since *de* cannot be independently used as a degree word in Spanish (\**Es de alta*).<sup>7</sup> Second, in the structure in (4), *de*+A is assigned the categorial status of an intermediate (X') projection and, as such, it should not be “visible” for movement operations (Chomsky, 1986: 4, 1995a: 396), but it is, as shown by the fact that it can be topicalized:

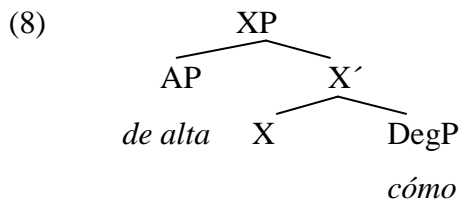
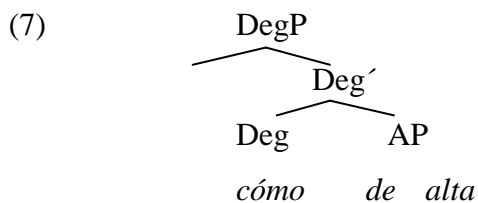
- (6) *De alta, ¿cómo es Ana?*  
       of tall how is Ann

Another shortcoming of the structural analyses in (4)-(5) is that, as far as we can see, there is no independent reason for generating *cómo* as an XP in [Spec, DegP], and *cuán/qué* as a Deg<sup>0</sup>. Finally, Morón Pastor crucially assumes that pied-piping can be optional, which is theoretically problematic, as argued in Pérez Ocón (2007) and Heck (2008, 2009). In her discussion of Morón Pastor’s proposal, Pérez Ocón points out, in particular, that optional pied-piping violates a minimalist economy condition whereby movement involves as less material as possible for convergence (Chomsky, 1995b:

<sup>7</sup> Sentences like the one in the text are well-formed with the interpretation and particular intonation of so-called “hidden exclamatives” (i.e. *¡Es de alta...!*). Masullo (2003) claims that an empty category associated with a [DEG MAX] feature is present in this type of exclamatives: *¡Es [Ø]<sub>Deg</sub> de alta...!*

262), which implies that, in the structure in (4), where two derivations compete for convergence, *cómo* should always move alone, this being the more economical option.<sup>8</sup>

Assuming that optional pied-piping has to be ruled out, Pérez Ocón (2007) gives an alternative account of the Spanish constructions in (3a) and (3b): in her view, these constructions result from two different underlying structures not competing for convergence, represented in (7) and (8), which correspond to the analyses of adjectival degree phrases in Abney (1987) and Corver (2000), respectively.



In the structure in (7), *cómo* is a degree operator heading a DegP, and, in compliance with the Structure-Preserving Condition (see above), pied-pipes *de*+A. In (8), it is merged as a predicate in a small clause configuration where it is predicated of the degree argument of the adjective. From this position, *cómo*, which is an independent constituent, can (and must) move on its own.

In addition to these insights, Pérez Ocón (2007) also claims that, in the discontinuous structure in (3b), *de+A* functions as a right-dislocated topic, on the basis, so she says, that it seems to show the information-structural and prosodic properties of right-

<sup>8</sup> On Heck's criticism on optional pied-piping see Section 3.1 below.

dislocated topics: in her view, like right-dislocated topics, *de*+A in the sentence in (3b) is interpreted as ground information, and is realized as an isolated tonal unit that follows a prosodic boundary after a falling intonation and ends up with a sustained pitch.

The proposal in Pérez Ocón (2007) on the pattern in (3) does better than the one presented in Morón Pastor (2004) in two respects. On the one hand, it conforms to the idea that optional pied-piping cannot exist. On the other hand, it captures the fact that *cómo de*+A is subject to a double segmentation, as shown in the examples in (9): in the wh-question in (9a), [*cómo de*+A] forms a single constituent, whereas in (9b) and (9c), *cómo* and *de*+A must be analyzed as two different structural units that separately raise to the sentential left-periphery.

- (9) a. ¿[*Cómo de alta*] es Ana?  
           how    of tall    is Ann
- b. ¿[*Cómo*] es Ana [de alta]?  
           how        is Ann of    tall
- c. [De alta], ¿[*cómo*] es Ana?  
           of    tall    how is Ann

There are, however, some problems with Pérez Ocón's proposal as well. First, she does not take any stance on the role the preposition *de* plays in the structures in (7) and (8). Second, degree wh-clauses introduced by *cuán* and exclamative *qué* are also not dealt with in her work: the problem is, in this case, that, under her proposal, it should be argued that *cuán* and *qué*, which obligatorily pied-pipe the adjective, are only inserted under Deg<sup>0</sup>, but this seems to be just an *ad hoc* solution. Third, her claim that *cómo* can be generated either as a degree operator or as a predicate is not independently justified.



And fourth, there is compelling empirical evidence showing that *de+A* in discontinuous [*cómo ... de+A*] is not a right-dislocated topic, among them the following.

To start with, against Pérez Ocón's judgments, it is clear to us, and to all native speakers we have asked on this point, that Spanish sentences like *¿Cómo es Ana de alta?* 'lit. How is Ann of tall?' can perfectly be pronounced without a prosodic boundary before *de+A*, and with a final lowering pitch, just like regular Spanish wh-questions are pronounced. Moreover, unlike right-dislocates, which "require highly salient reference in the immediate discourse to be licensed" (Villalba, 2003: 721) (10), *de+A* en [*cómo ... de+A*] can introduce new information, with no mention to the adjective in the previous discourse (11):<sup>9</sup>

(10) A: *Ayer vi a su hija.*

yesterday saw.1SG to her daughter

B: *Yo no la conozco, a su hija.*

I not her know.1SG to her daughter

(11) A: *Ayer vi a su hija.*

yesterday saw.1SG to her daughter

B: *¿Cómo está de alta?*

how is.3SG of tall

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<sup>9</sup> Our claim that *de+A* is not a right-dislocated topic in Spanish [*cómo...de+A*] benefits from the insights in Villalba (2003), who convincingly shows that *de+A* is not right-dislocated in Catalan exclamatives with [*com...de+A*] (e.g., *Com és de car aquest vi!* 'lit. how is of expensive this wine!'). For an overview of the properties of right-dislocated topics, see Villalba (2000) and the references therein.

This observation is corroborated by the fact that *de+A* can take part in echo questions:<sup>10</sup>

(12) A: *¿Cómo es Ana de melindrosa?*  
           how is Ann of squeamish

B: *¿Cómo es Ana de qué?*  
       how is Ann of what

Another difference between right-dislocated topics and *de+A* in [*cómo ... de+A*] is that the former cannot enter in contrast relations (Villalba, 2003: 722) (13a), whereas *de+A* can (13b):

- (13) a. *Había un hombre y una mujer. #Le regalaron un coche, a él,*  
           there.was a man and a woman him gave.3PL a car to him  
           *pero le compraron un vestido, a ella.*  
           but her bought.3PL a dress to her
- b. *Sé cómo es Ana de alta, pero ¿cómo es de inteligente?*  
       know.1SG how is Ann of tall but how is of clever

Furthermore, *de+A* can be the focus of negation (14), whereas right-dislocates cannot (15b):

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<sup>10</sup> We thank Cristina Sánchez López for pointing out to us that, unlike right-dislocated topics, *de+A* in [*cómo ... de+A*] can be echo-questioned, and can also fall under the scope of negation (see below in the text).

(14) A: *Ana es muy alta.*

Ann is very tall

B: *No necesito saber cómo es Ana de alta sino de inteligente.*

not need.1SG know how is Ann of tall but of clever

(15) a. *Yo no conozco a María sino a Ana.*

I not know.1SG to Mary but to Ann

b. *\*Yo no la conozco, a María, sino a Ana.*

I not her know.1SG to Mary but to Ann

To end up, again in contrast to right-dislocated topics, *de+A* can be followed by non-right-dislocated constituents:

(16) a. *¿Cómo era Ana de alta de pequeña?*

how was Ann of tall of young

b. *¿Cómo estaba Ana de borracha en la fiesta?*

how was Ann of drunk in the party

We must thus conclude from the evidence above that *de+A* in discontinuous [*cómo ... de+A*] is not a right-dislocated topic, but has the properties of a verbal adjunct instead. Nevertheless, like other verbal modifiers, *de+A* may also be right-dislocated, as in the example below, and, in this case, it does show the information-structural and prosodic properties Pérez Ocón (2007) ascribes to it (note that there is now a pause before *de+A*):

(17) A: *María es muy alta.*

Mary is very tall

B: *Ya lo sé, pero ¿cómo es Ana, de alta?*

already it know.1SG but how is Ann of tall

In the next section, we will present an analysis of (non)-pied-piping structures in Spanish degree wh-clauses that shares Pérez Ocón (2007)'s insight that optional pied-piping cannot exist, but does not meet the problems in her proposal.

### 3. The proposal

#### 3.1 Assumptions

Our analysis of the patterns in (1)-(2) will be based on two main assumptions. We will first adopt the widely shared view on the structure of adjectival degree expressions whereby the degree item canonically heads a DegP and takes AP as its complement (see, e.g., Abney, 1987; Grimshaw, 1991; Corver, 1997a,b), with the additional idea that degree wh-phrases in Spanish have the internal structure in (18), which includes two components, a wh-operator, that quantifies over degrees and provides interrogative or exclamative force, and a degree morpheme, arguably functioning as a degree variable, which is overtly manifested in the Old and American Spanish form *qué tan* ‘what so’:<sup>11</sup>

(18) [<sub>QP</sub> [<sub>Q</sub> *qué/cuán/cómo*] [<sub>DegP</sub> [<sub>Deg</sub> *tan/Ø*] [<sub>AP</sub> (*de*) *alta*]]]

Our second assumption, following Pérez Ocón (2007) and Heck (2008, 2009), is that pied-piping cannot be optional. As has been mentioned, Pérez Ocón (2007) rejects

<sup>11</sup> On the nature of the preposition *de* in *cómo de*+A see Sections 3.2 and 3.3.

optional pied-piping with the argument that it goes against the economy principles of Minimalism. Heck (2008, 2009), on his part, making use of the theoretical apparatus of Optimality Theory, claims that pied-piping is a last resort operation, so that pied-piping is only possible if forced. This is what he calls the Repair Generalization in (19) (Heck, 2008: 117; Heck, 2009: 92):

(19) *The Repair Generalization*

Pied-piping of  $\beta$  by  $\alpha$  is possible only if movement of  $\alpha$  from  $\beta$  is blocked.

The point in the statement in (19) is, in his words, that “in a competition based framework where pied-piping is a costly operation a derivation that involves pied-piping should always be blocked by one that does without it” (Heck, 2008: 273). Putting it differently, within this framework, pied-piping and stranding are not expected to coexist, since stranding would always block pied-piping (Heck, 2009: 95). Cases of optional pied-piping are thus always apparent, so Heck claims, and must be traced back to different sources, which can differ from case to case. With this idea in mind, Heck (2008: 273-294; 2009: 95-97) discusses different solutions to the problem of optional pied-piping proposed in the literature for different constructions across languages. To illustrate Heck’s approach to alleged cases of optional pied-piping, let us briefly review how he deals with one well-known case of apparent optionality: possessor extraction in Slavic languages.

As shown in (20), in Slavic languages like Russian, the wh-possessor can either be extracted or pied-pipe the whole DP:

(20) a. *Ja sprosil [čju<sub>i</sub> ty čital [ t<sub>i</sub> knigu]].*

- I asked whose you read book
- b. *Ja sprosila [[ čju knigu]<sub>i</sub> ty čital t<sub>i</sub>].*
- I asked whose book you read
- ‘I asked whose book you read.’

Heck (2008: 293-294; 2009: 96-97) suggests two alternatives to the existence of optional pied-piping in Russian possessor extraction. Building on the insights in Bošković (2004: 699-700n22) on a similar pattern in Serbo-Croatian, he points out that it could be first argued that a Russian nominal expression can be either a DP or an NP: if it is an NP, the possessor can be subextracted (21a); if it is a DP, the possessor cannot move alone, and pied-pipes the noun (21b), the reason being that, in this case, subextraction violates the Left Branch Condition in (22) (Heck, 2008: 121). Under this analysis, which reduces the optionality of pied-piping in (20) to the optional presence of D,<sup>12</sup> pied-piping in (21b) thus applies as a last resort operation in order to avoid a violation of the Left Branch Condition.

- (21) a. *Ja sprosila [čju<sub>i</sub> ty čital [NP t<sub>i</sub> [NP knigu]]].*
- I asked whose you read book
- b. *Ja sprosila [ [DP čju [NP knigu]]<sub>i</sub> ty čital t<sub>i</sub>].*
- I asked whose book you read

(22) *Left Branch Condition*

---

<sup>12</sup> An anonymous reviewer indicates that, without independent evidence for the existence of both DP and NP in Russian, there is circular reasoning in Heck’s proposal to the tune, in his/her words, of “If it pied-pipes, it must be that D is present in the structure. If not, then it isn’t.”

If  $\alpha$  is the leftmost category within DP, then  $\alpha$  can't undergo movement from DP

The second option Heck mentions is treating the non-pied-piping structure in (20a) as the result of subextraction of the NP followed by remnant movement (Abels, 2003: 161-174):<sup>13</sup>

- (23) *Ja sprosil [ [DP čju t<sub>i</sub> ]<sub>j</sub> ty čital t<sub>j</sub> [NP knigu]<sub>i</sub>].*  
 I asked whose you read book

Adhering to Heck's idea that truly optional pied-piping does not exist, we will next present our proposal on the case of apparent optional pied-piping under discussion in this paper, first addressing pied-piping structures.

### 3.2 Pied-piping structures

As we know, all wh-expressions in adjectival degree wh-clauses in Spanish pied-pipe the adjective:

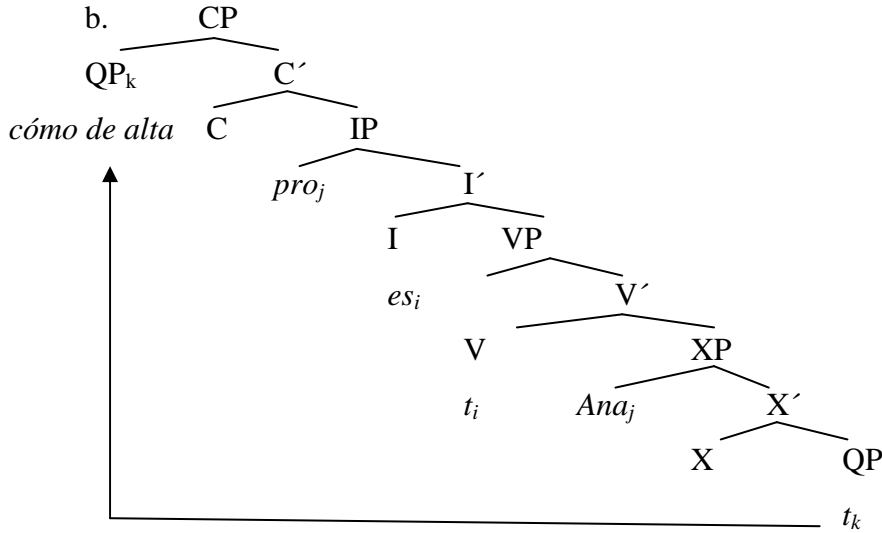
- (24) a. *¿i{Cuán/Qué tan/Cómo de} alta es Ana!?*  
 how much/what so/how of tall is Ann  
 b. *¿Qué alta es Ana!*  
 what tall is Ann

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<sup>13</sup>As a reviewer points out, a problem for this analysis is that, in the derivation in (23), *knigu* appears to be in a position resulting from rightward movement, which is generally prohibited assuming Kayne's (1994) antisymmetry of syntax.

Our account of the pattern in (24) is shown in the structures in (25a,b), taking *cómo de* ‘how of’ as an illustration:

(25) a. [<sub>QP</sub> [<sub>Q</sub> *cómo*] [<sub>DegP</sub> [<sub>Deg</sub>  $\emptyset$ ] [<sub>AP</sub> *de alta*]]]



In (25a), *cómo* heads a QP in the extended projection of the adjective (see Section 3.1). Under this analysis, *cómo*, which is a zero-level category, cannot move alone, in accordance with the Structure-Preserving condition (see above).<sup>14</sup> Pied-piping, acting as a last resort operation (see Section 3.1), is thus the only option, as represented in (25b). In this representation, we are assuming that copular sentences include a small clause in their underlying syntactic structure, which is a projection of a functional head (Bowers, 1993; Baker 2003). [*Cómo de*+A] is thus merged in the predicate position of the small clause, and raises from this position to [Spec, CP]. This last step in the derivation could be more complex if we adopt the theory of the sentential left periphery put forth in Rizzi (1997). It has been proposed in this respect that both interrogative and exclamative wh-

<sup>14</sup> The same scenario obtains under the Uniformity Condition on chains (Chomsky, 1995b: 253), stating that “a chain is uniform with regard to phrase structure status”, where “phrase structure status of an element is its (relational) property of being maximal, minimal, or neither”.



items have two features, a focus feature and a force ([wh]) feature, which are checked in two different functional projections in an articulated CP structure (Bosque and Gutiérrez-Rexach, 2009: 698, 710-711; Gutiérrez-Rexach, 2008). As depicted in (26), the wh-phrase would therefore first move to [Spec, FocP] to have its focus feature checked, and then raise to ForceP to check its interrogative/exclamative wh-feature:<sup>15</sup>

$$(26) \quad [_{ForceP} [+wh[_{int/excl}]] \quad WhP_i [_{FocP} [+focus] \quad t_i [ \dots t_i ] ] ]$$

To complete our analysis of the pied-piping structure with *cómo de* in (25b), following Masullo (2003) and Morón Pastor (2004), we finally consider that, in this case, *de* ‘of’ is a partitive Case marker, thus extending the analysis of preposition *de* heading the PP-complement in (pseudo)partitives as a Case marker (see Martí, 2010 and the references therein) to the adjectival domain. In taking this view, we are adopting the version of the Case Filter in Kayne (2002), whereby not just nouns, but also adjectives, receive Case.<sup>16</sup>

### 3.3 [*Cómo ... de+A*]: a reanalysis account

As we also know, in contrast to pied-piping structures, non-pied-piping structures are only allowed in Spanish adjectival degree wh-clauses with *cómo de*:

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<sup>15</sup> Non-uniform analyses of wh-interrogatives and wh-exclamatives have also been argued for in the literature: Zanuttini and Portner (2003) claim that exclamatives involve an extra layer of CP structure connected to factivity that is not present in wh-interrogatives; in the same line, Ambar (2003) holds that wh-phrases in exclamatives, but not in interrogatives, raise higher to an Assertive Phrase and an Evaluative Phrase.

<sup>16</sup> Under this analysis, a null partitive Case marker would also precede the adjective in *cuán/qué tan+A*. We leave open the possibility that (overt and covert) *de* projects a Case Phrase dominating AP, as proposed by Martí (2010) for the preposition *de* in the nominal partitive construction.

(27) ¿*¡Cómo es Ana de alta!?*

how is Ann of tall

Our proposal on the discontinuous structure in (27) is, in a nutshell, that this construction is the outcome of a reanalysis operation in the adjectival domain whereby *de+A* becomes a verbal adjunct.<sup>17</sup> This idea is inspired by the approach to so-called “subextraction” from DPs in Bosque and Gallego (2014). Contrary to current assumptions, these authors claim that extraction out of a DP, as in the derivation in (28) for a Spanish wh-clause like *¿De qué autor leyó Juan un libro?* ‘Of which author did John read a book?’, is not possible.<sup>18</sup>

(28) ¿ $[_{CP} \text{De qué } \text{autor}_i \text{ leyó Juan } [_{DP} t_i [_{D'} D [_{NP} \text{un libro } t_i ]]]]$ ?

of which author read Juan a book

Bosque and Gallego argue instead that apparent cases of subextraction from DPs involve a process of reanalysis turning a nominal dependent into a verbal dependent. Their proposal is represented in the simplified structures in (29b,c):

(29) a. *Juan leyó un libro de Vargas Llosa.*

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<sup>17</sup> The idea that sentences like the one in (27) could be analyzed as the result of reanalysis is hinted at, but not developed, in Pérez Ocón (2007: 227-228). On other cases of reanalysis in the AP domain, see Sáez (1993) and Bosque (1999).

<sup>18</sup> To support this claim, Bosque and Gallego (2014: 224-235) point out a number of problems raised by subextraction out of DPs, among them the fact that this phenomenon is subject to lexical restrictions (see the next footnote).

Juan read a book of Vargas Llosa

‘Juan read a book by Vargas Llosa.’

b. *Juan* [<sub>VP</sub> *leyó* [<sub>DP</sub> *un libro de Vargas Llosa*]].

c. *Juan* [<sub>VP</sub> [<sub>V</sub> *leyó un libro*] [<sub>PP</sub> *de Vargas Llosa*]].

In the structure in (29b), the PP (*de Vargas Llosa*) is first merged as a complement of the noun. In the reanalyzed structure in (29c), a complex predicate (*leer un libro*) is created, and the PP becomes a verbal dependent.<sup>19</sup> Under this analysis, alleged cases of subextraction from DPs are thus just standard cases of extraction of a verbal adjunct.

Bosque and Gallego (2014) make two remarks on which our account of [*cómo ... de+A*] will also be founded. They first assume that the effect of reanalysis is interpretive, and argue, in particular, that by becoming a verbal dependent, the PP in (29c) is interpreted as an aboutness dependent. And they also hold that reanalysing a PP that is first a nominal dependent as a verbal adjunct does not change the basic predicate’s structure, thus concluding that “the so called aboutness interpretation is not a property of some parallel structure that we must not confuse with a subextraction configuration, but rather an interpretive effect of reanalysis” (Bosque and Gallego, 2014: 248).

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<sup>19</sup> In Bosque and Gallego’s view, the process of complex predicate formation in (29c) explains, among other things, why some verbs allow for “subextraction” from their DP complement while others do not:

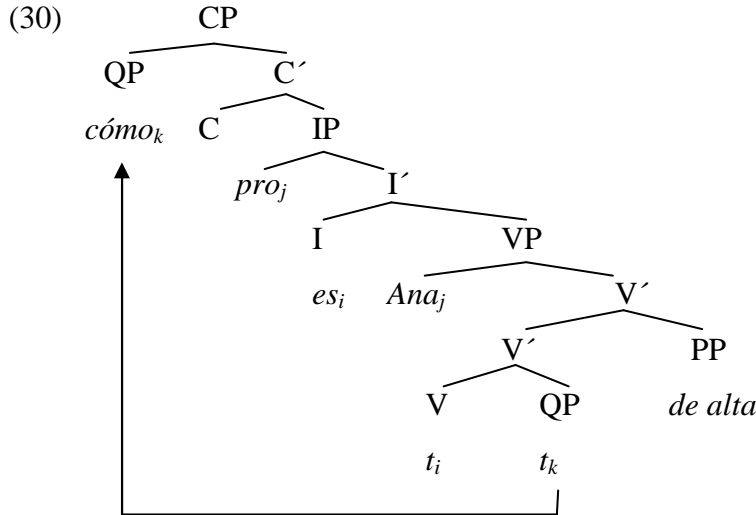
(a) i. *What<sub>i</sub> did Mary read books about t<sub>i</sub>?*

ii. *\*What<sub>i</sub> did Mary destroy books about t<sub>i</sub>?*

In their words, “the key of the *read-destroy* asymmetry is the capacity of the former verb to create a complex predicate, as opposed to the latter” (for details, see Bosque and Gallego 2014: 243-246).

Note also that complex predicate formation in (29c) is not a V-to-N incorporation process (see the discussion in Bosque and Gallego, 2014: 242, fn. 23).

Against this background, the analysis we have in mind for the Spanish non-pied-piping construction with *cómo de* in (27) is represented in the structure in (30), which is derived from the underlying configuration in (25b) through a process of reanalysis:



In the reanalyzed structure in (30), *cómo* ‘how’ forms a complex predicate with the copular verb, and [*de+A*] becomes a verbal dependent with a so-called “aboutness interpretation”, similar to the interpretation the PP in the sentence in (29) has after reanalysis (i.e. *Juan* [<sub>VP</sub> [<sub>V'</sub> *leyó un libro*] [<sub>PP</sub> *de Vargas Llosa*]] (29c)). A Spanish sentence like *¿Cómo es Ana de alta?* would thus be interpreted as ‘How is Ann with respect to the property of being tall?’. This interpretation is the one that is obtained when [*de+A*] occupies a topic position: *De alta, ¿cómo es Ana?* ‘lit. Of tall, how is Ann?’ (= ‘With respect to the property of being tall, how is Ann?’).<sup>20</sup> Since (30) is a

<sup>20</sup> The aboutness interpretation of the PP in the sentence in (29) also clearly obtains when it is not located after the noun (Bosque and Gallego, 2014: 246-247):

- (i) a. *Leí de ese autor muchas novelas.*  
       read of that author many novels  
     b. *De ese autor, leí muchas novelas.*  
       of that author, read many novels

derived structure, reanalysis does not change, however, the basic head-complement semantic relation between Deg and A in (25a), and the degree interpretation is preserved: as in the construction discussed in Bosque and Gallego (2014), the aboutness interpretation is thus just an additional interpretive effect of reanalysis in this case as well. Moreover, in the structural representation in (30), *cómo* is now an independent constituent (a maximal projection) that moves to the CP domain on its own, and *de* ‘of’ has the status of a true preposition.

Let us now compare our proposal with the one in Pérez Ocon (2007). Like her proposal, our analyses in (25b) and (30) also capture the fact that *cómo de*+A is subject to a double segmentation, and, in assigning two different underlying structures to the pied-piping and discontinuous structures with *cómo de*, they also conform to the view that optional pied-piping is not possible. Nevertheless, our proposal fares better than Pérez Ocon’s, so we believe, with respect to a number of central issues. First, an analysis of *de* ‘of’ in *cómo de* is now provided: this item is taken to be a Case marker in [*cómo de*+A] (25b), and a preposition with an aboutness interpretation in [*cómo ... de*+A] (30). Second, we need not posit, as Pérez Ocon does, that *cómo* can be both a degree operator and a predicate. Third, the representation in (30) expresses the fact that *de*+A in [*cómo ... de*+A] has the semantic and syntactic properties of a verbal adjunct. And fourth, in comparison to Pérez Ocon’s proposal, we account for the contrast between *cómo de* and the rest of Spanish degree wh-items in regard to their occurrence in non-pied-piping structures: given that reanalysis must always have an interpretive effect (see above), this can only be obtained if *de* ‘of’, which can convey an aboutness meaning, is present. Reanalysis is therefore not possible with *cuán*, *qué tan* and exclamative *qué*, which are not followed by *de*, and these wh-forms only occur in pied-piping structures.

To conclude this section, we will finally discuss two conceivable movement-based analyses of non-pied-piping [*cómo* ... *de+A*], represented in (31), which could in principle be an alternative to our reanalysis-based analysis, as they are also consistent with the ban on optional pied-piping: in (31a), [*cómo de+A*] first raises to [Spec, CP], and [*de+A*] is then extracted from this position, ending as a CP-adjunct; in (32b), the discontinuous structure with *cómo de* results from extraposition of *de+A* plus remnant movement.

- (31) a. [<sub>CP</sub> [<sub>CP</sub> [<sub>QP</sub> *cómo* *t<sub>i</sub>* ]<sub>j</sub> [<sub>C'</sub>  $\emptyset$  ... [<sub>IP</sub> ... [<sub>VP</sub> *es Ana t<sub>j</sub>*]]]] [<sub>PP</sub> *de alta*]<sub>i</sub>]  
 b. [<sub>CP</sub> [<sub>QP</sub> *cómo* *t<sub>i</sub>* ]<sub>j</sub> [<sub>C'</sub>  $\emptyset$  ... [<sub>IP</sub> ... [<sub>VP</sub> [<sub>VP</sub> *es Ana t<sub>j</sub>*] [<sub>PP</sub> *de alta*]<sub>i</sub>]]]]]

The derivation in (31a) is not well-formed, since it violates the Condition on Extraction Domains blocking subextraction from [Spec, CP] (see Gallego, 2009; 2010, and the references therein). PP extraposition, as in (31b), might be taken to be a licit operation instead.<sup>21</sup> Nevertheless, in our view, reanalysis is to be preferred to extraposition in this case for different reasons. As pointed out in Bosque and Gallego (2014: 245), “the dependents involved in reanalysis establish a more intimate dependency than those relevant for extraposition”, and extraposition, like heavy-NP shift, is generally assumed to be phonetically-oriented. In favor of our reanalysis-based account of [*cómo* ... *de+A*], as opposed to an extraposition account, it can thus be argued that this construction

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<sup>21</sup> A reviewer indicates, however, that the extraposition analysis in (31b) also appears to rely on rightward movement (see fn. 12), which is generally banned under Kayne’s (1994) antisymmetry of syntax.

underlies a head-complement structure (see (25b)), and also that *de*+A cannot be the target of a phonetically-driven movement operation, given its reduced size.<sup>22</sup>

#### 4. Extensions and apparent counterexamples

Given the fact that, in our analysis of [*cómo* ... *de*+A] in (30), reanalysis is dependent on the presence of preposition *de* ‘of’ (see the comments above), we predict that non-pied-piping structures should be, in principle, possible in all cases in which this preposition occurs together with a degree item and an adjective. This prediction is borne out, at least in Spanish, and in Romance more generally. As illustrated in the examples in (32), taken from Corver (2000: 167), the Romanian adjectival degree wh-form *cât de* ‘how much of’ behaves like Spanish *cómo de* in allowing for both pied-piping and non-pied-piping structures:

- (32) a. *Cât de vechi e acest vin?*  
           how much of old is this wine
- b. *Cât e de vechi acest vin?*  
           how much is of old this wine
- ‘How old is this wine?’

As shown by the CREA and Google examples in (33), the same pattern obtains with the corresponding degree wh-form *cuánto de* ‘how much of’, which is sometimes used in current Spanish:<sup>23</sup>

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<sup>22</sup> Standard cases of extraposition, as in (ib), do not underlie a head-complement structure, and in this construction, the extraposed constituent has a larger size (see Bosque and Gallego, 2014: fn. 25):

- (i) a. *A review of Chomsky’s book was published.*  
       b. *A review was published of Chomsky’s book.*

- (33) a. *¿Cuánto de cierto es eso?*  
           how much of true is that  
           ‘How true is that?’
- b. *¿Cuánto es de peligroso el Estado Islámico para Israel?*  
           how much is of dangerous the State Islamic for Israel  
           ‘How dangerous is the Islamic State for Israel?’

Furthermore, the paradigm in (32)-(33) is replicated, as predicted, in cases of focus movement involving the Spanish deictic degree word *así* ‘so’. Like *cómo* ‘how’, this item is followed by *de* (34a), and can either pied-pipe *de*+A (34b), or move alone (34c):

- (34) a. *Esta mesa es así de larga.*  
           this table is so of long  
           ‘This table is this long.’
- b. *ASÍ DE LARGA es esta mesa.*  
           so of long is this table
- c. *ASÍ es esta mesa de larga.*  
           so is this table of long

The idea that the occurrence of the non-pied-piping structures in (32) to (34) depends on the presence of preposition *de*, which allows for reanalysis to take place, is *prima facie* challenged by the existence of a well-known Romance construction, illustrated in (35), in which an exclamative wh-word that is not followed by *de* moves to the CP domain,

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<sup>23</sup> On this form, see Octavio de Toledo and Sánchez López (2009: 1051-52).



stranding the adjective. This construction can be found in Old Spanish (35a) and in some varieties of American Spanish (35b), as well as in French (35c) and in Italian (35d):<sup>24</sup>

- (35) a. *¡Cómo eres hermosa!*  
           how    are.2SG beautiful
- b. *¡Cómo eres cándida!*  
           how    are.2SG innocent
- c. *Comme elle est belle, Marie!*  
           how    she   is    beautiful Marie
- d. *Quanto è bella questa ragazza!*  
           how much is beautiful this    girl

Note, however, that the corresponding pied-piping structures in (36), in which the wh-word is displaced together with the adjective, are all ungrammatical:

- (36) a. \**¡Cómo hermosa eres!*  
           how beautiful are.2SG
- b. \**¡Cómo cándida eres!*  
           how innocent are.2SG
- c. \**Comme belle est Marie!*  
           how beautiful is Marie

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<sup>24</sup> The Old and American Spanish examples in (35a,b) are taken from Bosque (1984: 294) (on this Spanish construction, see also Octavio de Toledo and Sánchez López, 2009: 1033-1035). On the French and Italian constructions in (35c) and (35d), see Bosque (1984), Villalba (2003), Octavio de Toledo and Sánchez López (2007, 2009), Sánchez López and Octavio de Toledo (2010), and the references therein.

- d. \**Quanto bella è questa ragazza!*  
 how much beautiful is this girl

The fact that the sentences in (36) are not well-formed clearly indicates that the construction in (35) is not the result of a reanalysis process, since, in all the cases we have previously addressed, reanalysis operates on an underlying structure in which Deg+A forms a constituent that moves to [Spec, CP]. The apparently discontinuous structure in (35) must thus have a different source. A proposal in this line can be found in Bosque and Masullo (1998: 24, fn. 8) and in Bosque and Gutiérrez-Rexach (2009: 728). These authors argue that, in the Romance exclamative construction under discussion, the wh-word is not a degree item, but a type of manner adjunct with the meaning of ‘up to what extent’, corresponding to adverbs of proportion like *relativamente* ‘relatively’ or *en gran medida* ‘in a great extent’ in sentences like the one in (37a).<sup>25</sup> As represented in (37b), Bosque and Masullo (1998) and Bosque and Gutiérrez-Rexach (2009) thus propose that the wh-word in the examples in (35) is merged, like these adverbials, as a verbal adjunct, and raises from this position to the CP-domain.<sup>26</sup>

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<sup>25</sup> As pointed out by Octavio de Toledo and Sánchez López (2009: 1034), in the Old Spanish construction in (35a), the adjective frequently co-occurs with a degree adverb, which strongly supports the view that the wh-word is not a degree item in this construction. However, some of our Mexican Spanish, French and Italian informants accept the occurrence of a degree word preceding the adjective in exclamative sentences like the ones in (35b,c,d), while others do not. This might be due to the fact that, at least for some speakers, these sentences can also convey a degree meaning, which might be obtained as a pragmatic inference.

<sup>26</sup> A different analysis is presented in Gérard (1980: 37) and Bosque (1984: 294), who claim that the wh-word in the construction in (35) is a clausal adverb directly generated in COMP.

(37) a. *Este libro [[ es interesante] relativamente/en gran medida]].*

this book is interesting relatively/in great extent

b.  $j[{}_{CP} \text{Cómo}_j [{}_{IP} \text{eres}_i [{}_{VP} [{}_{VP} t_i \text{hermosa} ] [{}_{AdvP} t_j ]]]]!$

If the analysis in (37b) is on the right track, as we think it is, the construction in (35) is just an apparent counterexample to our idea that reanalysis can only take place in Romance adjectival degree wh-clauses if preposition *de* is present.

Another construction that could in principle be problematic for this view is the Italian interrogative construction illustrated in (38a):

(38) a. *Quanto è alta questa ragazza?*

how much is tall this girl

b. *\*Quanto alta è questa ragazza?*

how much tall is this girl

The example in (38a) shows that, in Italian degree wh-questions, the degree wh-word *quanto* ‘how much’ moves alone to the CP-domain, stranding an adjective that is not preceded by preposition *de*.<sup>27</sup> However, also in this case, the corresponding pied-piping structure in (38b) is not well-formed, which once again indicates that the structure in (38a) cannot be the outcome of reanalysis.<sup>28</sup> Rizzi (1990: 36) provides an analysis of

<sup>27</sup> That Italian interrogative *quanto* is a degree wh-word in (38a) is shown by the fact that the adjective can never cooccur with a degree item in this construction: i.e. sentences like *\*Quanto è molto alta questa ragazza?* ‘lit. How is very tall this girl?’ are completely out.

<sup>28</sup> According to Rizzi (1990: 35), pied-piping is sometimes possible as a stylistically marked option in special contexts, such as that of (i):

Italian adjectival degree wh-questions that is coherent with this view. He suggests that interrogative *quanto* is base-generated in the structural position in which measure phrases (MPs) combining with a bare adjective are merged in Italian. As illustrated in (39a), in this language, the MP follows the adjective, and, according to Rizzi, it is generated as an adjunct to the AP. This author therefore claims that Italian degree wh-questions use this position as the source of the wh-question operator *quanto* (39b):

- (39) a. *L'uomo era alt-o due metri.*  
           the man.MASC   was   tall.MASC   two   meters
- b. *Quanto<sub>i</sub> è [AP [AP alto] t<sub>i</sub> ]]*

Rizzi's proposal can be reformulated adopting the analysis of Italian MPs with bare adjectives in Zamparelli (2000: 280-290). As shown in (40), Zamparelli argues that MPs are located in [Spec, DegP], and holds that the [A+MP] order is derived by leftward movement of the adjective to the head position of a higher AgrP in order to have its features checked:<sup>29</sup>

- (40) *[AgrP [Agr' [Agr alt-o<sub>i</sub> ] [DegP due metri/quanto [Deg' [Deg Ø [AP [ t<sub>i</sub> ]]]]]]]]*

Under this analysis, Italian interrogative *quanto* would also be merged in [Spec, DegP], and move alone from this position to the sentential left-periphery.

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(i) *Sapevo che era alto, ma non immaginavo quanto alto potesse essere.*

'I knew he was tall, but I didn't imagine how tall he could be'

<sup>29</sup> See also Corver (2009) and Watanabe (2011) for an analysis of the Italian [A+MP] pattern along these lines.

## 5. Conclusions

In this paper, we have offered a novel analysis of pied-piping and non-pied-piping structures in adjectival degree wh-clauses in Spanish, which supports the idea in Heck (2008, 2009) that alleged cases of optional pied-piping are always apparent. Assuming that Spanish degree wh-items (i.e. *cuán*, *qué tan*, *cómo* and exclamative-only *qué*) are inserted in head positions in the extended projection of the adjective, we have first argued that, in compliance with the Structure Preserving Condition, all these forms obligatorily pied-pipe their adjectival complement. We have then proposed that discontinuous [*cómo* ... *de*+A] results from a reanalysis process whereby *de*+A becomes a verbal adjunct with an aboutness interpretation, so that *cómo*, which is now an independent constituent, raises to [Spec, CP] on its own. Under the view that reanalysis must have an interpretive effect to take place, which, in this case, is obtained through the presence of preposition *de*, the fact that the rest of degree wh-forms are excluded in non-pied-piping structures is thus explained. We have also extended our analysis to Spanish [*cuánto/así* ... *de*+A] and Rumanian [*cât* ... *de*+A]. And we have finally discussed two Romance constructions that, at first sight, cast doubts on the view that reanalysis depends on the presence of preposition *de*, showing that they are just apparent counterexamples.

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