

Adverbs in restricted configurations

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1 Introduction

The research on deadjectival adverbs – or more precisely *-ly*-type adverbs (henceforth LTAS) – has been mainly devoted to the study of LTAS that modify verbs and propositions, but little has been said about adverbs that modify adjectives. In (1) we see a list of interesting examples:

- (1) *extremely* tall, *endlessly* frustrating, *colossally* stupid, *deeply* talented, *widely* successful, *ridiculously* expensive.

In this paper I focus on LTAS that modify adjectives in the configuration illustrated in (2) and (3). The cases in (2-a), (2-b) and (3-a) are *wh*-exclamative constructions and the ones in (2-c) and (3-b) correspond to result clause constructions.

- (2) English
- You would never believe *how extremely tall* Pau is.
 - How colossally stupid* this joke is!
 - This job is *so endlessly frustrating*, that I am thinking of quitting.
- (3) Catalan
- Que extremadament alt* que és en Pau!
'How extremely tall Pau is!'
 - En Pau és *tan extremadament alt* que arriba al sostre.
'Pau is so extremely tall that he reaches the ceiling.'

By using both English and Catalan as my object language, I want to show that only a limited set of LTAS can occupy this position and I will be able to propose a classification of these adverbs that hinges on the kind of modification that they impose on the adjective. What I claim exactly is that only some of the available LTAS may behave as predicate modifiers. The rest are interpretable inasmuch they are treated as non-restrictive modifiers and, thus, as side comments by the speaker.

The organization of the paper is as follows: I first give some background information regarding to the relevant constructions and present the assumptions I make in order to understand what the problem is. In the third section I establish the two main

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issues that need to be addressed: are adverbs like *extremely* in *so extremely tall* predicate modifiers?, and do the rest of adverbs that appear in this position behave just like *extremely*? Section four is devoted to the proposal, which makes clear how restrictive and non-restrictive modifiers are semantically composed. The last section of the paper summarizes the findings of the paper and highlights the questions that still need to be answered.

2 Previous assumptions

In order to evaluate the interesting puzzles that arise w.r.t. LTAs preceded by *so/how* in *wh*-exclamatives and result clause constructions,¹ let us first introduce the relevant data from Catalan. In the following examples we can see two instances of *wh*-exclamative. In (4-a) the *wh*-phrase is a DegP, whereas in (4-b), the *wh*-phrase is a DP.

- (4) a. Que alt que és en Pau!
 how tall that is the P.
 ‘How tall Pau is!’
 b. Quin pastís **tan** bo que ha preparat en Ferran!
 what cake so good that AUX prepared the Ferran
 ‘What a nice cake Ferran made!’

In the former example, the degree head *que*² (‘how’) includes a [+wh] feature and that is why the entire DegP moves to the left periphery, whereas in the latter case, the indefinite *quin* (‘what’) holds this feature and the entire DP moves to CP.³ It is interesting to note that the DP introduced by *quin* includes a DegP headed by *tan* (‘so’) (i.e., *tan bo* ‘so good’), which is not necessarily present in *wh*-exclamatives, but which I assume is inferred from context when it is absent (in line with Castroviejo (2007), I take *wh*-exclamatives to be degree constructions, where the speaker exhibits his/her attitude towards a degree, even if is not explicitly spelled out).

¹By *result clause construction* I mean the degree construction that includes a matrix clause with a degree phrase headed by *so* that selects for a *that*-clause. I refer the reader to Meier (2003) for a complete description and analysis.

²Not to mistake with the homophone complementizer *que* (‘that’), which shows a drastically different distribution, as becomes obvious from the data that are presented. Admittedly, there is another type of exclamative clause in Catalan which is introduced by the complementizer *que*, but which does not involve *wh*-movement or degree modification by a degree word, and which cannot include an LTA (and thus it is not relevant for this paper). The first example below has a similar counterpart in French (but not in Spanish), and the second one is quite idiosyncratic among the Romance languages. See Villalba (2003) for an analysis.

- (i) a. Que és alt en Pau!
 that is tall the P.
 ‘How tall Pau is!’
 b. Que n’és d’alt en Pau!
 that CL.is of tall the P.
 ‘How tall Pau is!’

³Remarkably, both types of *wh*-exclamative in Spanish are introduced by the *wh*-word *qué*, but in Catalan they are morphologically distinct. In fact, the *wh*-word *quin*, which heads a DP, is reminiscent of the indefinite quantifier *un* (‘a’) preceded by the [+wh] feature *qu-*.

Moving on to result clause constructions, observe that they include the degree word *tan* ('so'), which takes as input a gradable adjective:

- (5) En Pau és **tan** alt que arriba al sostre.
'Pau is so tall that he reaches the ceiling.'

Notice that in both (5) and (4-b) we find the same degree head, namely *tan* ('so'). These examples contrast with (4-a), since its degree head is *que* ('how') and not *tan* ('so'), but I will assume along the lines of Castroviejo (2006) that *que* and *tan* share a number of characteristics: they are both measure phrases (in Kennedy and McNally (2005b)'s terminology) that take a gradable adjective and return a property of individuals (i.e., they are of type $\langle\langle e, d \rangle, \langle e, t \rangle\rangle$), they have the same degree semantics and they have the same syntactic structure within DegP. Of course, they involve some different properties (e.g., *que* triggers movement, a DegP headed by *que* can stand alone as a matrix *wh*-exclamative), but I assume these differences derive from the fact that *que* includes a [+wh] feature.

In the following example, we observe that both degree words precede the gradable adjective *alt* ('tall') and between the degree word and the adjective the LTA *extremadament* ('extremely') may occur.

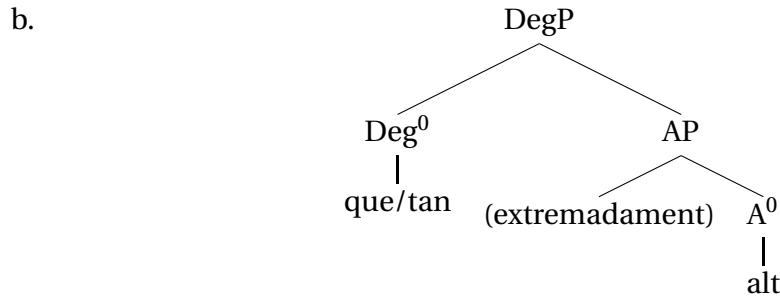
- (6) a. Quin noi [tan (extremadament) alt]!
'What an (extremely) tall boy!
b. [Que (extremadament) alt] que és aquest noi!
'How (extremely) tall this boy is!
c. En Pau és [tan (extremadament) alt] que arriba al sostre.
'Pau is so (extremely) tall that he reaches the ceiling.'

I posit that the examples above should be analyzed as in (7). Observe that in (7-a) we have an entire DP whose head noun selects for a DegP headed by *tan*, whereas in (7-b) we only have a DegP. Most importantly, the structures of both DegPs are identical.

- (7) a.
-
- ```

graph TD
 DP --> D0[D⁰]
 DP --> NP
 D0 --- quin[quin]
 NP --> N0[N⁰]
 NP --> DegP
 N0 --- noi[noi]
 DegP --> Deg0[Deg⁰]
 DegP --> AP
 Deg0 --- tan[tan]
 AP --> ext[extremadament]
 AP --> A0[A⁰]
 A0 --- alt[alt]

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As far as the degree semantics, observe that when we merge *so* or *tan* with a gradable adjective, it is always the case that the degree indicated is high. Consider (8) as an illustration of this phenomenon.

- (8) a. No et creuries mai quin pastís tan bo que ha preparat en Ferran. #Era tirant a bo.  
 ‘You wouldn’t believe what a nice cake Ferran made. It was almost nice.’  
 b. #En Pau és tan alt que pot passar per la porta.  
 ‘Pau is so tall that he can go through the door.’

Note that in (8-a), the degree of niceness of the cake needs to be high, because the follow-up of the first sentence cannot refer to a degree of niceness that does not reach a high level. The follow-up would be felicitous if we had *molt* (‘very’) instead. Likewise, the sentence in (8-b) is infelicitous, because – if we use common knowledge to state a standard of highness for doors – to be able to go through them does not imply to be tall to a high degree. Interestingly enough, this property of the degree word does not extend to other similar degree constructions, such as the ones that contain *too* and *enough* (cf. Meier 2003 and Hacquard 2004):

- (9) a. Pau is tall enough to go through the door.  
 b. Pau is too tall to go through the door.

If we add to this that the appearances of *tan* and *so* in contexts other than exclamatives and result clause constructions also involve high degree ((10)), we can assume that high degree is part of the semantics of the degree word itself.

- (10) a. #If Pau is so tall, he can go through the door.  
 b. Pau is not so tall. Actually, he can go through the door.

My assumption (cf. also Castroviejo 2006) is that all instances of *tan* (i.e., the ones in (8) and (10)) and *que* are translated as a function from measure functions (i.e., gradable adjectives) to properties of individuals ((11-b)). Crucially, the denotation of the degree word contains the functor TAN ((11-a)). This functor establishes a relation between a reference degree ( $d_R$ ) and a standard degree ( $d_S$ ) such that the former must be as least as high as the latter. As we see in (11-b), the reference degree in (11-a) is obtained by applying a measure function to an individual (e.g., the degree of tallness of individual  $x$ ) and the standard degree corresponds to a contextually determined degree that is high (represented as  $d_i$ ).

- (11) a.  $\llbracket \text{TAN}(d_R)(d_S) \rrbracket = 1$  iff  $d_R \geq d_S$

(Adapted from the definition of AS in Kennedy 1999)

- b.  $\lambda G_{\langle e, d \rangle} \lambda x [\text{TAN}(G(x))(d_i)]$

In a nutshell, (11-b) makes sure that the degree words *tan* and *que* translate as functions that take a gradable adjective and an individual and come out true, only if the degree to which this individual is ADJ<sup>4</sup> is at least as high as a contextually determined standard degree that is high.

For the sake of simplicity, I propose to use the following paraphrases, which will be enlightening enough to evaluate the problem we deal with in this article.<sup>5</sup> In particular, (13-a) corresponds to the exclamative in (12-a) and (13-b) corresponds to the result clause construction in (12-b).

- (12) a. Que alt que és en Pau!  
‘How tall Pau is!’  
b. En Pau és tan alt que arriba al sostre.  
‘Pau is so tall that he reaches the ceiling.’
- (13) a. Pau is *d*-tall, and  $d \geq$  the degree of tallness that it takes for the speaker to have an emotional attitude.  
b. Pau is *d*-tall, and  $d \geq$  the degree of tallness that it takes for Pau to reach the ceiling.

Observe that the preceding rough paraphrases treat *wh*-exclamatives and result clause constructions in a parallel fashion, except for the fact that the latter spell out the consequence of the individual having a high degree of ADJ-ness by means of a declarative clause and the former do not. Instead, I take intonation in *wh*-exclamatives to convey that the degree of ADJ-ness of a gradable adjective is high enough to provoke an attitude in the speaker. Hence, abstracting away from obvious differences between these two types of constructions (which perform different speech acts), we can use parallel paraphrases that help us capture how LTAs are semantically composed in these configurations.

### 3 The plot

In this section I present the main puzzle concerning the interpretation of LTAs in the configuration depicted above. Specifically, the puzzle consists of two problems: On the one hand, an adverb like *extremely* does not seem to behave like a predicate modifier and, on the other hand, there are LTAs like *ethically* and *intelligently* that do not behave like *extremely* in the very same configuration.

<sup>4</sup>I take ADJ to be a placeholder for any adjective meaning.

<sup>5</sup>Since it is not relevant for my purposes here, I disregard the fact that in result clause constructions, the actuality of the proposition expressed by the *that*-clause is implicated. For a discussion, see Meier (2003) and Hacquard (2004).

### 3.1 Problem A: is *extremely* a predicate modifier?

In cases like (14), *extremely* behaves like a predicate modifier in the sense that it is a property of a property. Or, given my previous assumptions, it is a kind of predicate that takes a measure function and returns another measure function (i.e.,  $\langle \langle e, d \rangle, \langle e, d \rangle \rangle$ ).

(14) Pau is extremely tall.

In this case, Pau's tallness is described as extreme.<sup>6</sup>

Let us now take a look at the examples we want to analyze (repeated here from (3)).

- (15) a. Que **extremadament** alt que és en Pau!  
'How extremely tall Pau is!'  
b. En Pau és tan **extremadament** alt que arriba al sostre.  
'Pau is so extremely tall that he reaches the ceiling.'

In what follows I would like to show, by means of a series of tests, that when we find an LTA like *extremely* in a *wh*-exclamative or a result clause construction, we do not obtain the intended meaning by intersecting the LTA and the adjective.

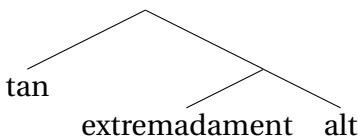

#### 3.1.1 Paraphrase

The first test consists in a paraphrase of the sort proposed in (13), which leads us to find out how the LTA needs combine in order to obtain the intended meaning:

- (16) a. #Pau is *d*-[extremely tall], and  $d \geq$  the degree that it takes for Pau to reach the ceiling.  
b. Pau is *d*-tall,  $d \geq$  the degree that it takes for Pau to reach the ceiling and *d* is described by the speaker as extreme.

Interestingly, (16-a), which would be the expected result if we treated the LTA as a predicate modifier, does not usually correspond to (15-b). Note that accepting (16-a) would presuppose the existence of a standard degree of being extremely tall which is surpassed by Paul's degree of tallness. I take this interpretation as not the most salient one when uttering (15-b).

The following tree represents the composition processes of (16-a) and (16-b), respectively:

- (17) a. 
- b. 

<sup>6</sup>I leave for future research the issue of whether the output of the function should be another measure function that merges afterwards with POS (i.e., the silent measure phrase that establishes a contextual standard of being ADJ-NESS, of type  $\langle \langle e, d \rangle, \langle e, t \rangle \rangle$ . Cf. von Stechow (1984a)) or whether the output is a property of type  $\langle e, t \rangle$ .

Note that in (17-a) the LTA is first composed with the adjective and then, the resulting gradable expression merges with the degree word *tan*. In contrast, in (17-b), the LTA is not part of the composition process. The adjective combines with *tan* and the LTA modifies the adjective in a separate domain.

### 3.1.2 Change of degree operator in exclamatives

The second test has to do with another degree *wh*-word that may introduce *wh*-exclamatives in Catalan, namely *com*, which should also be translated in English as ‘how’. Even if they involve different syntactic structures (e.g., in this other *wh*-exclamative the AP is stranded while the degree word moves to CP), *wh*-exclamative introduced by *que* and *com* have the same felicity conditions and they both update the common ground by exclusively contributing the speaker’s emotional attitude towards a degree (cf. Castroviejo 2006). That is, we could utter the sentences in (18) in the very same situations.

- (18) a. Que alt que és en Pau!  
           ‘How tall Pau is!’  
       b. Com és d’alt en Pau!  
           ‘How tall Pau is!’

However, once we add *extremely* as an adjective modifier, example (19-a) is acceptable (as we have seen so far), but example (19-b) is unacceptable or, more precisely, it has the unlikely interpretation in (16-a).

- (19) a. Que extremadament alt que és en Pau!  
           ‘How extremely tall Pau is!’  
       b. #Com és d’extremadament alt en Pau!  
           ‘How extremely tall Pau is!’

### 3.1.3 Other degree operators

Likewise, if we use any other degree word in either declarative or interrogative contexts, the most salient interpretation is the awkward one.

- (20) a. #Pau is more extremely tall than Marc.  
       b. #Marc is less extremely tall than Pau.  
       c. #Pau is too extremely tall.  
       d. #Pau is extremely tall enough.  
       e. #How extremely tall is Pau?

To recap, except for the cases in which *how* introduces a *wh*-exclamative, and in all occurrences of *so* in English and *tan* and *que* in Catalan, whenever an LTA modifies an adjective, the LTA does not behave like a predicate modifier.

## 3.2 Problem B: why doesn’t *ethically* behave like *extremely*?

In spite of the evidence provided in the previous section, here I want to show that the interim conclusion above is not completely true. Interestingly, the set of LTAs that may

occupy the position we have been considering in this paper is not uniform. There are LTAs like *ethically* that may follow *so*, *tan*, *how* and *que* and, yet, the interpretation of [so/how Adv Adj] is not like the one in the preceding examples. Below is the relevant pair of sentences:

- (21) a. Que dubtós que és l'assumpte!  
'How dubious the matter is!'  
b. Que èticament dubtós que és l'assumpte!  
'How ethically dubious the matter is!'

Let us now run the same tests that have been applied to *extremely* to understand in what ways the class of *extremely* and that of *ethically* differ.

### 3.2.1 Paraphrase

Starting with the paraphrase test, example (22-a)– and not (22-b) – describes the intended meaning in (21-b).

- (22) a. The matter is *d*-[ethically dubious], and  $d \geq$  the degree of *being ethically dubious* that it takes for the speaker to have an emotional attitude.  
b. #The matter is *d*-dubious,  $d \geq$  the degree of *being dubious* that it takes for the speaker to have an emotional attitude and *d* is described by the speaker as ethical.

Observe that the contrast between the two possibilities is reversed. Whereas in (16) the paraphrase in (16-a) is unlikely, here the intended meaning is the one in which the LTA first combines with the adjective (i.e., [ethically dubious]), and it merges later with *que* (or *tan*, *how* or *so*).

With respect to (22-b), the paraphrase is clearly unacceptable because a degree cannot be described as being ethical. However, it is interesting to realize that even if we paraphrase (21-b) by saying “and the doubt is described by the speaker as being ethical”, the result is not the one we want. Crucially, we have no reasons to compose *ethically* and *dubious* in a separate semantic domain. Also, we do not have any motivation to consider this claim the speaker's judgement, because *ethically* is not speaker-oriented. To see it more clearly, consider a result clause construction, where the speaker's attitude is not at stake as it is in *wh*-exclamative clauses.

- (23) This matter is so ethically dubious that nobody wants to get involved in it.

What we can observe in the sentence above is that *ethically* is not an evaluative adverb that describes the speaker's attitude towards the degree of being dubious. In fact, if the speaker wants to introduce his/her attitude towards a degree, s/he can employ focus on *so* or even use the LTA *extremely* as in *so extremely ethically dubious*.

### 3.2.2 Change of degree operator in exclamatives

As far as the use of *com* goes, we may build an example like (24-b) and we obtain the same meaning as the one paraphrased in (22-a).



- (24) a. Com és de dubtós l'assumpte!  
 how is of dubious the matter  
 'How dubious the matter is!'  
 b. Com és d'èticament dubtós l'assumpte!  
 'How ethically dubious the matter is!'

### 3.2.3 Other degree operators

Finally, as expected, the following combinations of degree word, LTA and adjective are acceptable (of course, we have to assume that there are different degrees of being ethically dubious).

- (25) a. This matter is more ethically dubious than the other.  
 b. This matter is less ethically dubious than the other.  
 c. This matter is too ethically dubious.  
 d. This matter is ethically dubious enough.  
 e. How ethically dubious is it?

Summing up, we have shown that *extremely* and *ethically* exhibit the opposite results to the proposed tests. That is, even if they are LTAs and may occur preceded by *how*, *so*, *que* and *tan* and preceding an adjective, they present different modes of composition.

## 3.3 Problem C: how is *intelligently* different from the other two?

Last but not least, we can have examples like (26), where the corresponding result clause construction or *wh*-exclamative without the LTA is not possible:

- (26) a. \*Aquesta cuina està tan dissenyada que sembla la cuina del futur.  
 'This kitchen is so designed that it looks like the kitchen of the future.'  
 b. Aquesta cuina està tan intel·ligentment dissenyada que sembla la cuina del futur.'  
 'This kitchen is so intelligently designed that it looks like the kitchen of the future.'

Let us see what results we obtain when we run all the tests.

### 3.3.1 Paraphrase

Interestingly, at first sight *intelligently* patterns with *ethically*, because the paraphrase in (27-a) is plausible, whereas the one in (27-b) is unacceptable:

- (27) a. This kitchen is *d*-[intelligently designed], and  $d \geq$  the degree of *being intelligently designed* that it takes for a kitchen to look like the kitchen of the future.  
 b. \*This kitchen is *d*-[designed], and  $d \geq$  the degree of *being designed* that it takes for a kitchen to look like the kitchen of the future, and *d* is described by the speaker as intelligent.

We will see shortly that (27-a) is not the exact mode of composition we want to obtain. To see it, we need to go over the rest of the tests. As for (27-b), however, it should be pointed out that the reason why it is unacceptable is that the predicate modified by the LTA is not gradable, which makes it impossible for us to paraphrase the meaning of (26-b) by saying that its degree of ADJ-ness is high. So in a way, the paraphrase does not only give out an implausible interpretation but, rather, it is plainly unacceptable.

### 3.3.2 Change of degree operator in exclamatives

The results from the second test are not without interest, either:

- (28) a. \*Com està de dissenyada aquesta cuina!  
           how is of designed this kitchen  
       b. \*Com està d'intel·ligentment dissenyada aquesta cuina!  
           how is of intelligently designed this kitchen

Sentence (28-a) has the interpretation in which a kitchen can be more or less designed; that is, the semantic pitfall is the same as in (26-a).<sup>7</sup> The same applies to (28-b), which is unacceptable unless we assume there is a certain degree for a kitchen of being intelligently designed.<sup>8</sup>

### 3.3.3 Other degree operators

To conclude, all the other relevant degree operators are able to modify the degree expression.

- (29) a. This kitchen is more intelligently designed than mine.  
       b. This kitchen is less intelligently designed than mine.  
       c. This kitchen is too intelligently designed.  
       d. This kitchen is intelligently enough designed / is designed intelligently enough.  
       e. How intelligently designed is this kitchen?

Before closing this section, notice the double possibility in (29-d), which does not parallel the same example with *ethically* above (cf. (25-d)); that is, the corresponding option *This kitchen is intelligently designed enough* is marginal. I will show in subsequent

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<sup>7</sup>Crucially, there is a big difference between (28-a) – the counterpart of (18-b) and (24-a) – and the sentence below (without *de* 'of' preceding the participle):

- (i) Com està dissenyada aquesta cuina!  
       'How this kitchen is designed!'

*Com* merges with a non-gradable predicate and, then, it modifies the predicate's event argument. In other words, in the sentence above, the speaker has an emotional attitude towards the way the kitchen has been designed. For instance, it may be very modern, very ugly or very old-fashioned.

<sup>8</sup>Interestingly, the construction below, which has a slightly different syntax, is less marginal for reasons that require further research.

- (i) Com d'intel·ligentment dissenyada està la cuina!  
       'How intelligently designed this kitchen is!'

sections that this is a relevant fact about the mode of composition of LTAs such as *intelligently* in this configuration.

Very briefly, we have observed that *extremely*, *ethically* and *intelligently* do not have the same properties when they modify an adjective in *wh*-exclamatives and result clause constructions. From now on, I will focus on the analysis of the first class of LTAs, which are the most likely to occur in such constructions, and I will just sketch an account for problems B and C later on.

## 4 Analysis

In a nutshell, I will argue that LTAs of the *extremely* class are non-restrictive modifiers, that is they represent a side comment by the speaker, and, crucially, they do not merge with the adjective in the same domain of meaning as the rest of the descriptive content of the sentence. With respect to the *ethically* class, I will show that, as domain adverbials, these modifiers do not take gradable adjectives as input, but rather they restrict the events referred to by the (gradable) predicate; and, finally, it will become clear that LTAs like *intelligently* – and not the combination of Adv and Adj – are modified by the degree words *so*, *how*, *tan* and *que* by virtue of the fact that these LTAs derive from a gradable adjective (i.e., *intelligent*).

### 4.1 Non-restrictive modifiers

#### 4.1.1 The direct antecedents

Building on the idea that certain lexical items are not part of the main sentential content, Potts (2005)<sup>9</sup> argues that epithets (like *damn* in *damn machine*) and non-restrictive relative clauses are conventional implicatures (Grice, 1989).<sup>10</sup> This thesis is taken up by Morzycki (2008), who expands the idea to account for adjectives and adverbs that have a non-restrictive interpretation.

Below are the paraphrases Morzycki presents as evidence of the difference between the two interpretation of modifiers in non-parenthetical positions. In these examples it becomes clear that both adjectives and adverbs in non-parenthetical positions can be interpreted either restrictively or non-restrictively, and what these two concepts refer to:

- (30) Every *unsuitable* word was deleted. (Larson and Marušič, 2004)
- a. Restrictive: every word that was unsuitable was deleted.
  - b. Non-restrictive: every word was deleted; they were unsuitable.
- (31) The Titanic('s) *rapidly* sinking caused great loss of life. (Peterson, 1997)
- a. Restrictive: The Titanic's sinking being rapid caused great loss of life.
  - b. Non-restrictive: The Titanic's sinking, which was rapid, caused great loss of life.

<sup>9</sup>But see also before him Bartsch (1976); Bellert (1977); Bach (1999) and Jayez and Rossari (2004), who make similar proposals w.r.t. the contribution of parentheticals.

<sup>10</sup>All along the article I take for granted that expressive meaning is (conventionally) implicated meaning and I use the term *expressive domain* and *implicated domain* of meaning interchangeably.

Morzycki concentrates on the non-restrictive interpretation of these modifiers and proposes the following more fine-grained paraphrase of (30-b), where  $C$  refers to the context:

- (32) a. Every unsuitable word $_C$  was deleted.  
 b. ‘Every word $_C$  was deleted. The words $_C$  were unsuitable.’  
 c. ‘For every word  $x$  in  $C$ ,  $x$  was deleted, and the sum of all words in  $C$  was unsuitable.’

He also proposes a rule, namely the Expressive Predicate Modification Rule (which derives predicate modification in the expressive domain), and represents (30-b) by means of a tree that contains the descriptive meaning above the bullet and the conventionally implicated meaning below it.

$$(33) \quad \begin{array}{c} \lambda x.word(x) \wedge x \in C : \langle e^a, t^a \rangle \\ \bullet \\ unsuitable(sup(\lambda y.words(y) \wedge y \in C)) : t^c \\ \diagdown \quad \diagup \\ unsuitable : \langle e^a, t^a \rangle \quad \lambda x.word(x) \wedge x \in C : \langle e^a, t^a \rangle \end{array}$$

In a different theoretical framework, Bonami and Godard (2008) show how evaluative adverbs like *malheureusement* (‘unfortunately’) do not contribute to the same domain as assertions. Specifically, they are lexically determined to have a special pragmatic behavior according to which the speaker uttering *malheureusement p* is committed to *evaluative p*, but this expression is never part of the *question under discussion*. This contribution to discourse differs drastically from an assertive speech act, where *p* needs to be accepted by the rest of the discourse participants before it becomes part of the common ground.

Along these lines, I will argue that *extremely* can be interpreted as an evaluative (or rather an expressive) and therefore it can be interpreted in a separate domain of meaning; that is, it can be viewed as a non-restrictive modifier.

#### 4.1.2 *Extremely* as a non-restrictive modifier

If we want to treat *extremely* as contributing to the conventional implicature domain, we expect the combination of the LTA and the adjective to represent a side comment (or *ancillary commitment*, as Bonami and Godard (2008) put it) of the speaker. Consequently, the meaning conveyed is speaker-oriented (or more precisely, judge-dependent, as in Potts (2007)) and it cannot be contradicted in the same manner as asserted meaning. Let us provide some arguments in favor of these claims.<sup>11</sup>

<sup>11</sup>J.M. Marandin (p.c.) commented on the possible inappropriateness of claiming that matrix exclamatives, which are said to be expressive constructions (cf. Castroviejo 2006), also include non-restrictive modifiers that are viewed as expressives. Even though it does not seem extremely problematic to assume that elements that belong to the implicated domain of meaning also include items that generate conventional implicatures, I believe this is a very good point and I agree that the design of such a possibility has to be considered in depth.

First, we see that we cannot deny the contribution of the LTA by the same means as regular asserted meaning. Compare (34-a) and (34-b):

- (34) a. A: Pau is tall. B: No, this is not true. Pau is extremely tall.  
 b. A: Pau is so tall that he reaches the ceiling. B: # No, this is not true. Pau is so extremely tall that he reaches the ceiling. [With a neutral intonation]

We observe in (34-a) that the addressee rejects (or rather *qualifies*) A's assertion by uttering that Pau is not only tall, but rather he is extremely tall. This is possible because *extremely* is composed here in the descriptive domain of meaning. However, this is not the case in (34-b). We cannot understand that B's contribution is a rejection of the asserted meaning provided by A, since the content that is supposed to qualify A's utterance (i.e., *extremely tall*) is not asserted, but implicated.

Likewise, if we look at the following example, we realize that the two sentences do not contradict each other, because the contribution of *extremely* does not have an effect on the assertive domain.

- (35) Pau is so tall that he reaches the ceiling. Kareem is so extremely tall that he reaches the ceiling, too, though Kareem isn't as tall as Pau.

It is interesting to note that the fact that we add *extremely* modifying *tall* in the result clause construction does not necessarily make Kareem taller than Pau. The fact that the speaker believes Kareem to be extremely tall is a side comment that has no direct repercussion on the asserted content. It only informs the discourse participants that the speaker is emotional about Kareem's tallness.

Building on this previous idea, let us show that all the LTAs that may be side comments express the speaker's emotional attitude. That is, non-restrictive modifiers behave like expressives.

- (36) a. En Pau és tan extremadament alt que arriba al sostre.  
 'Pau is so extremely tall that he reaches the ceiling.'  
 b. En Bill Gates és tan fastigosament ric que ja no sap què més comprar.  
 'Bill Gates is so disgustingly rich that he doesn't know what else to buy.'  
 c. En Hoynes està tan rotundament equivocac que no pot enganyar a ningú.  
 'Hoynes is so absolutely wrong that he cannot fool anybody.'

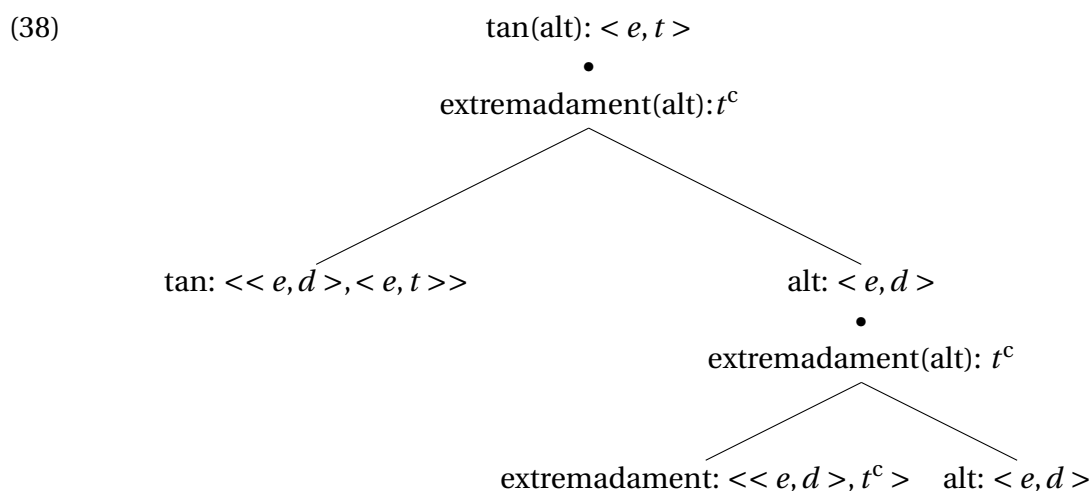
Notably, in (36-a) the speaker is amazed at Pau's degree of tallness, in (36-b) s/he is upset about Bill Gates's richness, and in (36-c) s/he is indignant at how wrong Hoynes is. To prove that this emotional attitude is an ancillary commitment, observe that it cannot be denied, because it is an entailment:

- (37) Pau is so extremely tall that he reaches the ceiling, # but his tallness doesn't impress me / # but I'm not touched by his tallness.

To conclude this section, let us make a final relevant clarification. Contrary to what is claimed for evaluatives (and for conventional implicatures more generally), I argue that *extremely* can be interpreted non-restrictively as a last resort operation. That is, just like any other predicative adverb (or just like *unsuitable* in (30)), *extremely* enters the derivation with the two options, i.e., in principle, it should be able to be interpreted

restrictively or non-restrictively. However, in the structures we have been considering, where *so* and Adj combine, the restrictive modification does not provide the intended meaning (recall the paraphrase in (16-a)). Therefore, the only manner in which this combination of words can make sense is by interpreting the LTA as composing with the adjective in a separate domain of meaning. This is possible because ancillary commitments are speaker-oriented and can be analyzed separately from the regular descriptive meaning.

In the following tree I represent the semantic composition of the DegP *tan extremadamente alt* ('so extremely tall'):



Differently from Morzycki (2008), I do not make use of the Expressive Predicate Modification rule. Very simply, I understand that *extremely* modifies *tall* at the implicated domain. As we can see, the measure function *tall* is used as input for another function in both the descriptive and the expressive domain, as expected, and because in the implicated domain we cannot find open functions, the output of the modifier *extremely* is a truth value.<sup>12</sup>

#### 4.1.3 The class of non-restrictive modifiers

So far I have only taken *extremely* as an example of a non-restrictive modifier, so it is time we considered the entire class of these items. Characteristically, they are interpreted as intensifiers because of their conveying an emotional attitude by the speaker (cf. Castells 2005, p. 112). Also, it is relevant that the adjective they precede is gradable (it must merge with the degree word *so*, *how*, *tan* or *que*), but they need not be. On the other hand, they are not a uniform class w.r.t. their semantic type. All they have in common is that, even if they can usually be interpreted restrictively, in the structures we are considering they are most of the time interpreted non-restrictively by virtue of the fact that they can convey the speaker's emotional attitude.

Among them, we find *extremely*, whose adjective describes a degree of ADJ-ness as being extreme. Also, the so-called *attitude toward degree modifiers* (cf. Katz 2005), such as *surprisingly* (e.g., *surprisingly full*), *frustratingly* (e.g., *frustratingly late*), *strangely*

<sup>12</sup>Naturally, it would be desirable to propose a uniform analysis for *extremely* in all domains of interpretation, but how this should work out requires further research.

(e.g., in *strangely familiar*) or *insanely* (e.g., in *insanely insecure*).<sup>13</sup> Finally, we include LTAs that are preposed to verbs (when they occur as verb modifiers). In such cases, they behave as intensifiers (cf. Bolinger 1972). For instance: *definitely smart, literally beautiful, absolutely right, positively impressed*.

#### 4.1.4 Advantages of the proposal

Aside from being able to account for the puzzles presented in the previous sections and to present another context in which modifiers are interpreted non-restrictively, I would like to highlight a few advantages derived from this analysis. First of all, we can straightforwardly explain the contrast presented by Elliott (1974):<sup>14</sup>

- (39) a. How very/unbelievably/extremely long he can stay under water!  
 b. \*How slightly/fairly/reasonably long he can stay under water!

So far, this contrast had been used as evidence to argue that exclamation indicates extreme degree, but there was no account for the puzzle. In my analysis, I can give two possible reasons as for why (39-b) is awkward. On the one hand, if the LTAs *slightly, fairly* and *reasonably* are interpreted restrictively, then we obtain a combination of Adv and Adj that is not a measure function; in other words, the following sentences are equally odd:

- (40) a. #He can stay more slightly long under water.  
 b. #He can stay fairly long enough under water.  
 c. #How reasonably long can he stay under water?

On the other hand, if these adverbs are interpreted non-restrictively, then we obtain a contradiction between the high degree that results from [*tan/que, so/how* Adj] and the attitude that underlies the use of these adverbs. This contradiction is paraphrased below:

- (41) He can stay under water *d*-long,  $d \geq$  the degree that it takes for the speaker to have an emotional attitude, # and the speaker describes *d* as slight/fair/reasonable.

Another advantage of the present proposal is that we can provide a simple account for a very relevant contrast pointed out by Zanuttini and Portner (2003), to which they give a rather complex explanation.<sup>15</sup>

<sup>13</sup>According to Katz (2005), the example in (i-a) should have the paraphrase in (i-b).

- (i) a. The pool is surprisingly full.  
 b. It is surprising that the pool is as full as it is and it'd be surprising were it fuller.

<sup>14</sup>I respect Elliott's star on (39-b), even though the clash in this sentence has to do with the semantics; no syntactic principle seems to be violated.

<sup>15</sup>According to Zanuttini and Portner (2003), in cases like (42-b), there is an incompatibility between the speaker's lack of knowledge asserted by the predicate and the factive presupposition introduced by the *wh*-exclamative. Specifically, when we have an attitude verb that takes a presupposed clause – i.e., the *wh*-exclamative–, the subject believes what the clause presupposes. Importantly, even the negative predicate inherits the presupposition. In the case at hand, there is a presupposition according to which

- (42) a. I know how extremely tall Pau is.  
 b. \*I don't know how extremely tall Pau is.  
 c. He doesn't know how extremely tall Pau is.  
 d. I didn't know how extremely tall Pau was.

Observe that if the verb *know* is on the first person of the present tense, it can introduce an embedded *wh*-exclamative.<sup>16</sup> All other things being equal, if the verb is negated, then the predicate cannot introduce an exclamative ((42-b)). However, if the subject is a third person ((42-d)) or the verb is in the past tense ((42-d)), then we do find an embedded *wh*-exclamative. My interpretation of these facts involve two important assumptions:

- To be able to analyze an LTA non-restrictively in these configurations, it must be implied that the speaker is committed to the descriptive content of the clause (i.e., s/he must be able to answer the question *how ADJ is x?*). The speaker cannot evaluate a property about which s/he has doubts.
- Non-restrictive modifiers of the *extremely* class are not lexically identified as conventional implicatures. If the context does not provide the appropriate conditions (cf. the condition above), then they are interpreted restrictively and this yields an awkward interpretation along the lines of (16-a).

Given the preceding assumptions, let us try to explain the contrasts. First, if the verb is on the first person of the present tense, then the subject is identified with the speaker. Knowledgeability (i.e., the implication that the speaker knows how tall Pau is) makes it possible for *extremely* to be interpreted non-restrictively. If, on the other hand, the speaker denies his/her own knowledge, s/he cannot express an emotional attitude caused by Pau's degree of ADJ-ness. Hence the awkwardness of (42-b). But if the verb is on the third person, then the subject is not identified with the speaker. Moreover, the focalization of the negation of someone else's lack of knowledge can be understood as the implication that the speaker does know Pau's degree of ADJ-ness. This, allows again the presence of *extremely* interpreted non-restrictively ((42-c)). Finally, if the verb is on the past tense, the negation of the past tense triggers the implication that at the present tense the speaker already knows Pau's degree of ADJ-ness and, thus, s/he can introduce expressive meaning ((42-d)).

I will close this section by mentioning one last generalization derived from the present account, namely that the non-restrictive interpretation of these adverbs also involves a very strict syntactic configuration. Specifically, the degree word must trigger pied-piping of the AP and the adverb must be deadjectival, that is, of the *-ly* type

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the speaker believes that Pau is – roughly – tall to an extreme degree. However, the predicate asserts that the speaker does not know that Pau is extremely tall. Zanuttini and Portner appeal to this contradiction to explain the inacceptability of (42-b). The acceptable (42-c) and (42-d) do not incur this contradiction because it is not asserted that the speaker does not know how tall Pau is. Note that this would not disallow \**John wonders how extremely tall Pau is*, which they explain by an independent reason.

<sup>16</sup>According to Elliott (1974); Grimshaw (1979); Gutiérrez-Rexach (1996) and Zanuttini and Portner (2003), the presence of the adverb is the identifier of the *wh*-clause as an embedded exclamative in English. Bear in mind that in embedded contexts, *wh*-interrogatives and *wh*-exclamatives have the same word order.



in English and of the *-ment* type in Catalan. The first condition makes it possible for the degree word and the LTA to both merge with the adjective, even if this happens in different levels of meaning. If there is no pied-piping, then the adjective and the LTA first merge and the resulting gradable expression combines afterwards with the degree word, which would give us interpretation in (16-a) above. The second constraint is responsible for the fact that the degree of ADJ-ness is described as ADJ (e.g., extreme, surprising, etc.). If these two syntactic conditions are not met, then we do not obtain the non-restrictive interpretation of the LTA. We can see below some interesting consequences of this generalization.

First, we begin to understand why the Catalan counterpart of (43-a) is grammatically unacceptable ((43-b)).

- (43) a. How very tall he is!  
b. \*Que molt alt que és!

Since *molt* ('very'), even if it is an intensifier, is not an LTA, it cannot occur in this position. It follows that we may have to interpret *very* as an LTA that means *truly*. It is thus possible that *very*'s intensifier meaning stems from its being a preposed LTA (cf. Bolinger 1972).

Analogously follows the contrast in (44):

- (44) a. El llenguatge de la pel·lícula era tan excessivament formal que ningú la va entendre.  
'The language of the movie was so excessively formal that nobody understood it.'  
b. \*El llenguatge de la pel·lícula era tan massa formal que ningú la va entendre.  
'The language of the movie was so too formal that nobody understood it.'

Even if *excessivament* ('excessively') and *massa* ('too') are semantically almost indistinguishable, only the former is able to stand in this configuration.

Second, it seems that we can establish an analogy between *extremely* modifying an adjective in result clause constructions and *wh*-exclamatives, and LTAs that occur as premodifiers of verbs, all of which are interpreted non-restrictively and must have deadjectival morphology (cf. Bolinger 1972, p. 259):

- (45) a. He laboriously slaved at the task.  
b. \*He hard slaved at the task.

In the examples above, as in the contrast depicted in (44), the LTA, but not the almost synonym non-deadjectival adverb, is able to stay in this position.

And third, it is borne out that the *wh*-exclamatives that are not introduced by a degree word that involves pied piping of the AP, cannot include adverbs like *extremely* modifying the gradable adjective. This is true for the type of *wh*-exclamatives in Catalan introduced by *com* ('how') ((46-a)) and generally for exclamatives in French ((46-b)), where this possibility is banned or marginal (or acceptable with the interpretation in (16-a)).

- (46) a. #Com és d'extremadament alt! (Catalan)  
'How extremely tall he is!'

- b. #Comme il est extrêmement grand! (French)  
 ‘How extremely tall he is!’

This does not entail, of course, that the presence of such a syntactic structure allows for the presence of *extremely*. It is a necessary but not sufficient condition that needs to be checked cross-linguistically.

## 4.2 Restrictive but not intersective modifiers

In the following two subsections I move on to the slightly less common LTAs that may occur in *wh*-exclamatives and result clause constructions in English and Catalan modifying an adjective.

Let us start with *ethically*. Interestingly, if we want to maintain the measure function analysis of gradable adjectives, we are inclined to propose the simplified analysis below, where we assume that *ethically* takes as input a measure function and it returns a measure function:

$$(47) \quad \begin{array}{c} \text{tan}(\text{\`eticament}(\text{dubtós})): \langle e, t \rangle \\ \lambda x[\text{TAN}((\text{ethically}(\text{dubious}))(x))(d_i)] \\ \hline \begin{array}{cc} \text{tan}: \langle \langle e, d \rangle, \langle e, t \rangle \rangle & \text{\`eticament}(\text{dubtós}): \langle e, d \rangle \\ \lambda G \lambda x[\text{TAN}(G(x))(d_i)] & G: \lambda z.(\text{ethically}(\text{dubious}))(z) \end{array} \end{array}$$

Notice that the semantic composition above is identical to the one without the adverb ((48)), except for the fact that instead of considering the gradable adjective *dubious*, we have another measure function, namely *ethically dubious*.

$$(48) \quad \begin{array}{c} \text{tan}(\text{dubtós}): \langle e, t \rangle \\ \lambda x[\text{TAN}(\text{dubious}(x))(d_i)] \\ \hline \begin{array}{cc} \text{tan}: \langle \langle e, d \rangle, \langle e, t \rangle \rangle & \text{dubtós}: \langle e, d \rangle \\ \lambda G \lambda x[\text{TAN}(G(x))(d_i)] & G: \lambda z.\text{dubious}(z) \end{array} \end{array}$$

Nevertheless, *ethical* has a wider syntactic distribution and also combines with verbs, which suggests that the analysis above is too simple. Let us just sketch an alternative which, in fact, would lead us to give up on the measure function analysis of gradable adjectives. My claim is that *ethically* restricts one of the arguments of *dubious*, and the resulting gradable expression merges with the degree word *so*, *how*, *tan*, *que*. Consequently, we cannot understand the adjective *dubious* as being of type  $\langle e, d \rangle$ , but rather a relation between an individual, a degree and an additional variable – i.e., the one that is bound by *ethically*.

First of all, we should consider other instances of this type of modification. For example, *genetically weak*, *personally disappointing*, *sexually ambiguous*, *politically correct* or *economically harmful*. In all these cases, the adjective is gradable, but the LTA

is not.<sup>17</sup> These LTAs are reminiscent of the so-called *domain adverbials* (Ernst 2002), which also include *mathematically, economically, morphologically, telepathically* and *politically*.

In Ernst (2002)'s account, the sentences in (49) represent the *pure domain* reading of such adverbs,<sup>18</sup> which amounts to saying that the adverb restricts the set of events to the subset characterized as being in a particular domain. To illustrate it with Ernst (2002)'s examples, in (49-a) there is a set of painful events that fall into the political domain (i.e., from all the possible painful events related to all possible domains, we only take into account the ones related to politics). Also, in (49-b), there is a set of developing events that becomes restricted to only the economical domain, so the sentence does not say anything about political development, for instance.

- (49) a. These budget cuts will be painful politically.  
b. Some Asian countries have developed economically only recently.

In an analogous fashion to (49-a), we can say about (50) that there is a set of dubious events and we restrict ourselves to the ones in the ethical domain. In other words, the matter might not be *legally* dubious at all.

- (50) Aquest assumpte és tan èticament dubtós que ningú no s'hi vol embolicar.  
'This matter is so ethically dubious that nobody wants to get involved in it.'

According to the way Ernst approaches domain adverbials, *ethically* should be viewed as event internal. This means that it modifies one of the arguments of the verb at L-syntax. It is restrictive, but not strictly speaking intersective.<sup>19</sup>

This analysis according to which *ethically* only takes as input one of the arguments of the adjective is not only insightful w.r.t. the semantics of the modification (we do not mean that the adjective *dubious* is ethical, but rather we mean that we restrict ourselves to the dubious events that concern the ethical domain). Also, if we assume that the LTA may bind this variable at a distance,<sup>20</sup> we can derive the wide distribu-

<sup>17</sup>Note that these [Adv Adj] combinations have an [Adj N] counterpart where Adj is a relational adjective (e.g., *ethical doubt, genetic weakness, sexual ambiguity*, etc.). Interestingly, in such configurations, the Adj is claimed to modify only one of the arguments of N (cf. McNally and Boleda 2004).

<sup>18</sup>There is also a *means* reading, which does not concern us here. Below are his (6.11a) and (6.11b) examples:

- (i) a. They classified all the examples morphologically.  
b. The aliens expressed themselves telepathically.

<sup>19</sup>Specifically, he claims that it represents

a restriction on a contextual variable  $c^*$ , which in turn restricts the range of events for the basic event variable via the covert predicate UNDER ( $e, c^*$ ) in VP.

Below is the representation for the example (49-a):

- (i) [<sub>E</sub> [<sub>E</sub> PAINFUL ( $e$ ) & Agt( $e, b$ ) & UNDER ( $e, c^*$ )] & CR (POLITICAL,  $c^*$ )]

In the DRT simplified formula above, CR(POLITICAL,  $c^*$ ) is the representation of the political domain restriction on the conditions  $c^*$  and UNDER ( $e, c^*$ ) – which is part of the translation of every predicate – expresses that the painful events are considered under circumstances  $c^*$ .

<sup>20</sup>In Ernst (2002)'s account, the decisive factor is the low occurrence of UNDER ( $e, c^*$ ). Domain adver-

tion of these adverbials. That is, aside from preposed to the adjective, we usually find them clause initially and postposed to the adjective without a change in the truth-conditional meaning of the sentence, so (51) could be uttered felicitously in the same situations as (50).

- (51) a. Èticament, aquest assumpte és tan dubtós que ningú no s'hi vol embolicar.  
'Ethically, this matter is so dubious that nobody wants to get involved in it.'
- b. Aquest assumpte és tan dubtós èticament que ningú no s'hi vol embolicar.  
'(lit.) This matter is so dubious ethically that nobody wants to get involved with it.'

Of course, in order to derive the compositional semantics of [*tan/que, so/how Adv Adj*], we need the following assumptions:

- Adjectives like *dubious* are of type  $\langle z, \langle d, \langle e, t \rangle \rangle \rangle$ , where  $z$  is this dimension that can be bound by the adverb.
- Domain adverbials are functions of the sort  $\lambda z.ADV(z)$ .
- There is a lexical rule that makes sure that whenever a domain adverbial combines with an adjective, the adverb modifies  $z$  and the resulting predicate is a relation between individuals and degrees (i.e.,  $\langle d, \langle e, t \rangle \rangle$ ), which can merge with a degree word.

I leave the further considerations regarding the consequences of these claims for future research. What is relevant for the purposes of this paper is that *ethically dubious* should be seen as a gradable expression that can merge with the degree word *tan, so, que, how*. *Ethically* is not a regular intersective predicate, because it does not take the entire adjective as input, but only one of its arguments. However, it is restrictive and it composes semantically in the descriptive domain of meaning.

### 4.3 Modified modifiers

The last type I am concerned with is that of LTAs like *intelligently* in phrases like *so intelligently designed*. Characteristically, these LTAs are gradable and they modify a participle, as in *beautifully phrased, badly injured, slowly cooked, gently stirred* or *genuinely surprised*.

With respect to these [Adv Adj] combinations I will claim that only the adjective is the argument of the degree word *so, how, tan, que*. More specifically, I propose a derivation along the following lines:

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bials only spell out the specification of the domain and can restrict  $c^*$  from different positions unproblematically without changing the truth conditions of the sentence. Hence the above VP and VP-adjoined occurrences of *symbolically* in (i) are formalized as in (ii):

- (i) They (symbolically) could (symbolically) have (symbolically) been cutting an old umbilical cord (symbolically).
- (ii) a. CR (SYMBOLIC,  $c^*$ ) ... [<sub>E</sub> F(e) ... & UNDER(e,  $c^*$ )]  
b. ... [<sub>E</sub>' [<sub>E</sub> F(e) ... & UNDER(e,  $c^*$ )] & CR (SYMBOLIC,  $c^*$ )]

$$\begin{array}{c}
 (52) \quad \text{tan(intelligentment): } \langle e, t \rangle \\
 \quad \quad \lambda e[\text{TAN(intelligent}(e))(d_i)] \\
 \quad \quad \swarrow \quad \searrow \\
 \text{tan: } \langle \langle e, d \rangle, \langle e, t \rangle \rangle \quad \text{intelligentment: } \langle e, d \rangle \\
 \lambda G \lambda x_e[\text{TAN}(G(x))(d_i)] \quad G: \lambda z_e.\text{intelligent}(z)
 \end{array}$$

Note that I treat *intelligently* as a measure function just like the adjective it is derived from (cf. Ernst 2002). However, instead of taking as input an individual of type  $x$ , it takes an eventive-type individual (i.e., of type  $e$ ).

Now, if we understand that some adjectives include an event argument (cf. Larson 1998), we may accept the translations  $T$  in (53) for the phrase *intelligently designed*, where the participle also has an individual argument that corresponds to the theme of the event.

$$\begin{array}{l}
 (53) \quad \text{a. } T(\text{designed}) = \lambda z_e \lambda x[\text{designed}(x, z)] \\
 \quad \quad \text{b. } T(\text{intelligently}) = \lambda y_e[\text{intelligent}(y)] \\
 \quad \quad \text{c. } T(\text{intelligently designed}) = \lambda z_e \lambda x[\text{designed}(x, z) \ \& \ \text{intelligent}(z)]
 \end{array}$$

Nevertheless, since we have seen that the degree word modifies only the adverb in the combination [Adv Adj], we need a modified version of the proposal above, namely (54).

$$(54) \quad T(\text{so intelligently designed}) = \lambda z_e \lambda x[\text{designed}(x, z) \ \& \ \text{so} - \text{intelligent}(z)]$$

This explains the puzzles in (55)–(56) and (57)–(58).

- $$\begin{array}{l}
 (55) \quad \text{a. intelligently enough designed} \\
 \quad \quad \text{b. designed intelligently enough} \\
 \quad \quad \text{c. *intelligently designed enough} \\
 (56) \quad \text{a. *ethically enough dubious} \\
 \quad \quad \text{b. *dubious ethically enough} \\
 \quad \quad \text{c. ethically dubious enough}
 \end{array}$$

Above, we compare the possible placement of the degree word *enough* depending on whether the adverb is *intelligently* ((55)) or our previous case, *ethically* ((56)). It is clear from the sentences in (55) that the degree word must follow the adverb, but it cannot directly modify the participle, which is the opposite restriction that applies to the adverb in (56), where Adv and Adj do form a unit before they merge with the degree word.

Also, observe that in (57), the adverb itself can be modified by a degree word, but this is not the case for most participles that can be modified by adverbs like *intelligently*.

- $$\begin{array}{l}
 (57) \quad \text{a. intelligently designed: very intelligently, *very designed} \\
 \quad \quad \text{b. beautifully phrased: more beautifully, *more phrased}
 \end{array}$$

Certainly, some participles can be modified (cf. Kennedy and McNally 2005). However, in the depicted configuration, the degree word does not modify the degree argument of the participle, as (58) shows:

- (58) This meat is so slowly cooked that it tastes wonderfully. Fortunately it is not too cooked.

What the previous example shows is that the high degree of being ADV V-ed does not entail a high degree of being V-ed. Precisely, the meat is cooked very slowly, but its degree of being cooked must not be high.

Therefore, *intelligently designed* is another case of modification that does not involve a semantic composition in a separate domain of meaning (as was the case with *extremely tall*) but it is not comparable to *ethically dubious*, either, because the former LTA is gradable and thus it can combine with the degree word before merging with the adjective (in fact, the past participial), whereas the latter LTA restricts an argument of the adjective it merges with before combining with the degree word.

## 5 Concluding remarks

In this paper I have addressed two basic problems in the interpretation of adverbs that modify adjectives in *wh*-exclamatives and result clause constructions in Catalan and English. The first problem is the acknowledgment that, unexpectedly enough, adverbs that in other contexts behave like predicate modifiers, like *extremely* in *extremely tall*, do not seem to be interpreted in the same fashion when they are preceded by the degree words *so*, *how*, *tan*, *que* and they precede a gradable adjective. The second problem that I have considered is the fact that, aside from adverbs that indicate the speaker's attitude like *extremely*, there are some other deadjectival adverbs that may occupy this position, even if they do not form a homogeneous class.

Below is a summary of my main conclusions:

- Between *tan/que*, *so/how* and an adjective we can find a restrictive modifier only if it merges with the adjective to obtain a gradable expression that can be modified by the degree word.
- Also, an LTA may be interpreted in the regular descriptive domain of meaning if it is modified by *tan/que*, *so/how*, and [*tan/que*, *so/how*+Adv] modify a past participle.
- When by performing the semantic compositions above we do not obtain the desired meaning, then it is possible to interpret the LTA non-restrictively only if: (a) the LTA can convey an emotional attitude by the speaker, and (b) the adjective is gradable.
- Unlike regular conventional implicatures triggered by evaluatives, LTAs like *extremely* are interpreted non-restrictively as a last-resort operation (i.e., as a way of obtaining a meaningful interpretation out of the DegP), and this is possible because this class of adverbs can convey an emotional attitude by the speaker.

To conclude, the topics touched upon in this paper suggest some interesting lines of research. To begin with, we still need to learn and explore in depth what kind of operations happen in the expressive domain of meaning and in what way it is analogous

to the descriptive dimension. For instance, it would be desirable to find out how different sources of expressive meaning (e.g., a parenthetical and an epithet) interact when they co-occur in a construction.

Moreover, it would be convenient to build a full compositional semantics for the cases like *so ethically dubious* and *so intelligently designed*. Starting from here, we might find additional arguments for or against the measure function analysis of gradable adjectives.

In this paper I hope to have successfully shown that adverbs that modify adjectives should be taken into account seriously, because they are able to raise many interesting questions, most of which still await an answer.

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