

# A unified account of degree *surprisingly* with bare adjectives and comparatives\*

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## 1. Introduction

This paper addresses evaluative adverbial modifiers such as *surprisingly*, *amazingly*, *incredibly*, *strangely*, etc. (Nouwen 2011) in degree constructions. For expository purposes, we focus on *surprisingly*. As observed by Katz (2005) (see also Nouwen 2005, 2011), *surprisingly* can combine with gradable adjectives like *tall* to give rise to two types of readings, namely, a propositional reading and a degree reading. This is illustrated in (1). Thus, in the example, the speaker in (1) can either be surprised that Alex is tall (1a) (this is the propositional reading) or at Alex's height (1b) (this is the degree reading).<sup>1</sup>

- (1) Alex is *surprisingly* tall.
- a. PROPOSITIONAL READING: the proposition *that Alex is tall* is surprising to the speaker.
  - b. DEGREE READING: the degree representing Alex's height is surprising to the speaker.

Nouwen (2011) notes that, in the propositional reading of (1) in (1a), the degree representing Alex's height is interpreted with respect to the standard of comparison—in this sense, (1) with the reading in (1a) conveys the same meaning as the sentence *Surprisingly, Alex is tall*, where the adverbial expression appears at the beginning of the sentence. This interpretation, however, is not available with regard to the reading of (1) in (1b), i.e., the degree representing Alex's height need not exceed the standard of comparison. Following Katz (2005), Nouwen notes that (1) with the reading in (1b) does not necessarily entail (2). This is illustrated in connection with (3): in this case, it is made clear that Alex's height

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<sup>1</sup>In this paper, we will refer to the speaker as the subject that finds propositions/degrees surprising for simplicity. See footnote 4 for further discussion with regard to cases where the sentences under discussion are embedded.

is below the standard of comparison; it is possible to say that Alex is *surprisingly* tall—without *surprisingly*, the sentence is infelicitous. If (3), with *surprisingly*, entailed (2) it would be infelicitous, which is not the case.

- (2) Alex is tall.
- (3) Although he is short, Alex is #(surprisingly) tall, given his background.

For the rest of the paper, we are mainly concerned with the interpretations that arise when *surprisingly* behaves as a degree morpheme (which we will call “degree *surprisingly*”) rather than a propositional modifier.

Although much work has been done analyzing degree *surprisingly* in the positive construction (see, for instance, Katz 2005; Morzycki 2008; Nouwen 2011), there has been no explicit analysis, to the best of our knowledge, of what happens when degree *surprisingly* modifies gradable adjectives in the comparative construction. The relevant sentences are as in (4b).<sup>2</sup>

- (4) a. Gabriel is taller than Tania.
- b. Gabriel is *surprisingly* taller than Tania.

In this paper, we analyze sentences like (4b) and propose a unified account of degree *surprisingly* with regard to its ability to combine with bare adjectives (in sentences like (1)) and comparatives (in sentences like (4b)). The discussion is organized as follows: we will first address our novel empirical observation in connection with (4b) in section 2. In section 3, we will address the number of positions that are available for degree morphemes (including measure phrases) in these constructions. Based on the empirical discussion in these sections, we will provide an account of them in section 4. By doing so, our proposal provides an additional argument in favor of the need of differential degrees in the comparative construction. We then suggest further that our findings could be extended cross-linguistically in section 5. Section 6 concludes the paper.

## 2. Novel observation

Provided that *surprisingly* can in fact appear in the comparative construction preceding the adjective, it is perhaps to be expected that there be a degree reading in these constructions—this would be similar to the presence of a degree reading for sentences like (1) above. (4b) is repeated in (5). With regard to this sentence, we make the novel observation that there is in fact a degree reading of it. Crucially, the degree reading that arises is tied to a differential degree, in particular, what is surprising to the speaker is the degree representing the difference in height between Gabriel and Tania. This reading is stated in (5a). Note that one might expect that there be another degree reading for this sentence: for instance, one could

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<sup>2</sup>The propositional reading of (4b) is that the proposition *that Gabriel is taller than Tania* is surprising. Although this reading is not the main focus of this paper, we make a brief reference to it in section 3.

expect that the degree reading of (1b) be present in (5), i.e., it could be the case that the degree that is surprising is that representing Gabriel's height only. This, however, does not seem to be right—this unavailable reading is stated in (5b). Instead, the differential reading is the only interpretation that is available. It is thus the case that the differential reading in (5a) is different from the degree reading in (5b) in that the degree that is surprising does not represent Gabriel's height; instead, what is needed is the calculation representing the difference in Gabriel's and Tania's height.

- (5) Gabriel is *surprisingly* taller than Tania.
- a. DIFFERENTIAL READING: the degree resulting from the difference between Gabriel's and Tania's height is what is surprising to the speaker.
  - b. #DEGREE READING: the degree representing Gabriel's height is surprising to the speaker.

In order to show that the differential reading in (5a), but not the degree reading in (5b), is available with regard to (5), we present two contexts that target each of these readings. The differential reading in (5a) is targeted in (6a), where it is made explicit that what is being targeted is the difference in height between Gabriel and Tania. (5) is felicitous in this context. The degree reading is targeted in (6b); in this case, what is targeted is the degree representing Gabriel's height. (5) is infelicitous in this context.

- (6) a. You see Gabriel and Tania in the distance and you think that Gabriel is taller than Tania. You think Gabriel is taller than Tania by 2 inches. Upon closer inspection, you realize that Gabriel is actually 10 inches taller than Tania.
- b. You see Gabriel and Tania in the distance and you see that Gabriel is way taller than Tania. You think Gabriel is 6 feet. Upon closer inspection, you realize Gabriel is over 7 feet tall. (But your perception of Gabriel's and Tania's height difference has not changed.)

Note that this discussion further suggests that, regardless of the actual heights of the individuals involved, what is relevant is the difference between the two heights. This is in fact the case: context (6a) remains silent with regard to whether Gabriel and/or Tania are tall or short—they could actually be both short and (5) will still be felicitous under the differential reading in (5a). This is then similar to what was discussed with regard to (3), where Alex's height was surprising regardless of him being tall or short.

It is important to note as well that while the differential reading is the salient reading for most speakers, it is not readily available for some speakers. Even so, these speakers report that only the propositional reading is available to them and never the degree reading. This is evidence for us that one (perhaps the) crucial aspect of comparatives is a differential degree, as has been discussed extensively in the literature.

### 3. One degree morpheme slot

In this section, we further note that there is only one slot for degree morphemes (including measure phrases) in the constructions discussed in this paper. The sentence in (7) adds a measure phrase, namely, *6 feet*, to sentences like (1), i.e., to sentences with both *surprisingly* and a bare adjective. In this case, the only available reading for *surprisingly* is the propositional one, i.e., that the proposition *that Gabriel is 6 feet tall* is surprising. This suggests that there is only one slot for degree morphemes in these sentences.

(7) Gabriel is *surprisingly* 6 feet tall.

Something similar can be said in connection with the comparative construction. (8) shows a sentence similar to (5), where *surprisingly* is included, but adds, again, a measure phrase—*2 inches* is the measure phrases added in this case. As in (7), *surprisingly* in (8) can only contribute with the propositional reading, namely, that the proposition *that Gabriel is 2 inches taller than Alex* is surprising. This suggests that only one slot for degree morphemes (including measure expressions) modifying the comparative construction is available in this case as well.

(8) Gabriel is *surprisingly* 2 inches taller than Alex.

### 4. Analysis

This section discusses our account. We will give bare adjectives and comparatives a similar denotation in that degree morphemes can combine with both of them without resorting to lexical ambiguity in the adverb. Following Nouwen (2011) (see also Katz 2005, Nouwen 2005, Morzycki 2008), we propose that degree *surprisingly* (and similar evaluative expressions) are degree morphemes combining with adjectives, to which we add the possibility of combining with the comparative construction. We further discuss how *surprisingly* is to be understood with regard to other degree morphemes, in particular, the positive degree morpheme *pos*.

#### 4.1 Assumptions

Following Kennedy & Levin (2008), we assume that, syntactically, both bare adjectives and the comparative construction have only one degree morpheme slot, which is abstractly represented as Deg (see Morzycki 2015). The relevant structures are shown in (9), where A stands for adjective. The internal structure of the complement of Deg in (10), which we label  $\alpha$ , is not relevant in our discussion; what is relevant is that it only has one degree morpheme slot. In (10),  $y$  stands for the individual setting the standard of comparison. We also make the simplifying assumption that theme  $x$  combines with DegP directly.

(9) [  $x$  [DegP Deg A ] ]

$$(10) \quad [x \text{ [DegP Deg } [\alpha \text{ more A than y } ]]]$$

The presence of exactly one degree morpheme slot is the crucial element in the syntactic structures assumed in our account, since this derives the facts discussed in connection with (7)-(8), where degree morphemes and measure phrases cannot co-occur in the same expression—here we make the somewhat simplifying assumption that degree morphemes and measure phrases occupy the slot of Deg in (9)-(10); ultimately, regardless of the label one decides to assume, what is important here is that they occupy the same slot (see Kennedy & Levin 2008).

Semantically, the denotations we assume for (9)-(10) appear in (11)-(12) respectively. They follow Kennedy & Levin’s (2008) core proposal that both bare adjectives and the comparative denote measure functions that take an individual and a world as input, and give a degree as output—these are thus objects of type  $\langle e, sd \rangle$ , where  $s$  is the type of worlds. In the case of bare adjectives, these denote a measure function  $m$  that takes an individual and a world, and gives as output a degree in the scale associated with the adjective; this is shown with the place holder A in (11).

$$(11) \quad \llbracket A \rrbracket = \lambda x_e \lambda w_s [m(x)(w)]$$

The denotation of the comparative (which we represent with the placeholder  $\alpha$ ) appears in (12). It denotes a differential measure function  $m_d^\uparrow$  that is like  $m$  except that the degree it returns for an individual in its domain represents the difference between the individuals projection on the scale and a degree  $d$ , which is the degree represented by the comparative standard  $m(y)$ ) Kennedy & Levin (2008), Nouwen (2011)— $y$  would be already saturated when Deg combines:<sup>3</sup>

$$(12) \quad \llbracket \alpha \rrbracket = \lambda y_e \lambda x_e \lambda w_s [m_{m(y)}^\uparrow(x)(w)]$$

Note that our syntax and semantics make bare adjectives and the comparative construction similar in that, syntactically, there is exactly one slot for a degree morpheme that combines with them and, semantically, they are of the same type. In this sense, our proposal extends Nouwen’s (2011) to fit in the comparative construction as well by making bare adjectives and the comparative construction similar in the relevant way.

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<sup>3</sup>The definition of the difference function Kennedy & Levin (2008:172) propose appears in (i)—we adapt it in terms of worlds:

- (i) For any measure function  $m$  from objects  $x$  and worlds  $w$  to degrees on a scale  $S$ , and for any  $d \in S$ ,  $m_d^\uparrow$  is a function just like  $m$  except that:
- a. its range is  $\{d \in S : d \leq d'\}$ , and
  - b. for any  $x, w$  in the domain of  $m$ , if  $m(x)(w) \leq d$ , then  $m_d^\uparrow(x)(w) = d$ .

## 4.2 Degree *surprisingly*

We now turn to the denotation of degree *surprisingly*—which is extensible to similar evaluative adverbs, e.g., *incredibly*, *amazingly*, etc. (see Katz 2005; Nouwen 2005, 2011; Morzycki 2008 for a more extensive list). In the spirit of Nouwen (2011), but substantially changing the details of his account, we propose that *surprisingly* is a degree morpheme, which, in our account, means that it is of type  $\langle\langle e, sd \rangle, \langle e, st \rangle\rangle$ . Its function is to turn a degree denoting expression into a property of individuals, in particular,  $\llbracket \text{surprisingly} \rrbracket$  applied to a degree denoting expression (a bare adjective or the comparative construction here) is true of measure function  $m$ , individual  $x$  and (actual) world  $w$  if and only if  $m$  (applied to  $x$ ) in  $w$  exceeds  $m$  (applied to  $x$ ) in worlds  $w'$  compatible with the expectations  $Exp$  of a relevant individual. In the present discussion, the relevant individual is the speaker  $Sp$ . The denotation of *surprisingly* appears in (13).<sup>4</sup>

$$(13) \quad \llbracket \text{surprisingly} \rrbracket = \lambda m_{\langle e, sd \rangle} \lambda x_e \lambda w_s [\forall w'_s \in Exp_{Sp} [m(x)(w) > m(x)(w')]]$$

(14)-(15) illustrate the proposal ((14a)-(15a) repeat (1)-(4b) respectively). We include the (simplified) Logical Forms (LFs) of (14a)-(15a) in (14b)-(15b) respectively. (14c) says that the LF (14b) is true of (actual) world  $w$  iff Alex's height in  $w$  exceeds his height in all the speaker's expectation worlds  $w'$ . (15c) says that the LF in (15b) is true of (actual) world  $w$  iff the difference in height between Gabriel and Tania in  $w$  exceeds their difference in height in all the speaker's expectation worlds  $w'$ .

- (14) a. Alex is *surprisingly* tall.  
 b.  $\llbracket \text{Alex} [\text{DegP surprisingly tall}] \rrbracket$   
 c.  $\llbracket (14b) \rrbracket = \lambda w_s [\forall w'_s \in Exp_{Sp} [\text{tall}(a)(w) > \text{tall}(a)(w')]]$
- (15) a. Gabriel is *surprisingly* taller than Tania.  
 b.  $\llbracket \text{Gabriel} [\text{DegP surprisingly} [\alpha \text{ more tall than Tania}]] \rrbracket$   
 c.  $\llbracket (15b) \rrbracket = \lambda w_s [\forall w'_s \in Exp_{Sp} [\text{tall}_{\text{tall}(t)}^\uparrow(g)(w) > \text{tall}_{\text{tall}(t)}^\uparrow(g)(w')]]$

## 4.3 Degree *surprisingly* and the positive degree morpheme *pos*

Following Nouwen (2011), our proposal makes *surprisingly* a degree morpheme. As he further discusses, *surprisingly* is, in this sense, similar to other degree morphemes, in particular, he proposes that it has the same type as the positive degree morpheme *pos*. Here we

<sup>4</sup>It may well be some other individual, for instance, when the sentences discussed in this paper appear embedded, so it could be the expectations of the attitude holder of the matrix predicate, as in (i), where the expectations of Mary could be the relevant ones.

- (i) Mary believes that Gabriel is *surprisingly* taller than Tania.

state how our proposal is compatible with his claim.<sup>5</sup> In our approach, this means that degree morphemes are of type  $\langle\langle e, sd \rangle, \langle e, st \rangle\rangle$  (Kennedy & Levin 2008). Note that both bare adjectives and the comparative construction combine with a degree morpheme, in particular, just as *surprisingly*, a degree morpheme, as shown in the LFs in (9)-(10), can combine with both, the approach taken here means that *pos* can combine with both as well—this latter point follows Kennedy & Levin (2008). Under this approach, then, the parallels between *surprisingly* and *pos*, as Nouwen (2011) can be maintained.

The denotation of *pos* we assume appears in (16) (Kennedy & Levin 2008). As in the case of degree morpheme *surprisingly*, it turns a degree denoting expression into a property of individuals, which will compare this degree to the standard *stnd*, which represents the degree of the norm of comparison (Stechow 1984, Kennedy 1999, 2007, Kennedy & Levin 2008). In particular,  $\llbracket \text{pos} \rrbracket$  applied to a degree denoting expression (a bare adjective or the comparative construction here) is true of measure function *m*, individual *x* and (actual) world *w* if and only if *m* (applied to *x*) in *w* exceeds the degree represented by the standard *stnd* of *m* in *w*.

$$(16) \quad \llbracket \text{pos} \rrbracket = \lambda m_{\langle e, sd \rangle} \lambda x_e \lambda w_s [m(x)(w) \geq \text{stnd}(m)(w)]$$

In particular, the standard *stnd* for a bare adjective is the minimum degree required to stand out in context relative to the measurement of such adjective. The standard in the comparative construction—the comparative *stnd*—is determined by the denotation of the *than*-constituent in English. This is exemplified in (17)-(18) ((17a)-(18a) repeat (1a)-(4a) respectively). (17c) says that the LF in (17b) is true of (actual) world *w* if and only if Alex is at least as tall as the standard of tallness in *w*. (18c) says that the LF in (18b) is true of (actual) world *w* if and only if the degree that results from applying the difference function to Gabriel is non-zero relative to the comparative *stnd*, i.e, greater than the derived zero in the scale represented by Tania's height.

- (17) a. Alex is tall.  
 b.  $\llbracket \text{Alex} [\text{DegP pos tall}] \rrbracket$   
 c.  $\llbracket (17b) \rrbracket = \lambda w_s [\text{tall}(a)(w) \geq \text{stnd}(\text{tall})(w)]$

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<sup>5</sup>Jon Gajewski points to us that evaluative adverbs like *surprisingly* and *pos* (under Kennedy & Levin 2008 analysis, which we are adopting here) are special in that they can combine with bare adjectives and the comparative construction, which is not the case with other (apparent) degree morphemes. Instances of the latter are exemplified in (i)-(ii). In (i), *very* is only possible with a bare adjective; in (ii), *much* is only possible in the comparative construction.

- (i) a. Bill is very tall.  
 b. \*Bill is very taller than Sue.
- (ii) a. \*Bill is much tall.  
 b. Bill is much taller than Sue.

We leave the discussion of the restriction in the distribution of degree morphemes for future research.

- (18) a. Gabriel is taller than Tania.  
 b. [ Gabriel [DegP pos [ $\alpha$  more tall than Tania ]]  
 c.  $\llbracket(18b)\rrbracket = \lambda w_s [tall_{tall(t)}^\uparrow(g)(w) \geq stnd(tall_{tall(t)}^\uparrow)(w)]$

## 5. Cross-linguistic extension

The proposal developed in section 4 seems to hold more extensively to other degree languages. In particular, the distribution of evaluative adverbs like degree *surprisingly* is rather similar cross-linguistically: the discussion in this paper also holds in Indo-European and non-Indo-European languages. With regard to the former, this is the case in Germanic languages like Dutch (19), Romance languages like Spanish (20) and Slavic languages like Polish (21). With regard to the latter, this is the case in Japanese (22) and Korean (23). Thus, these languages have evaluative degree adverbs like English *surprisingly* that combine with bare adjectives and the comparative construction. With regard to the former, there is a degree that exceeds the expectations of the speaker; with regard to the latter, the degree representing the the difference between two individuals exceeds the expectations of the speaker.

(19) *Dutch*

- a. Marlijn is *verbazingwekkend* lang.  
 Marlijn is surprisingly tall  
 ‘Marlijn is surprisingly tall.’  
 b. Marlijn is *verbazingwekkend* langer dan Jos.  
 Marlijn is surprisingly taller than Jos  
 ‘Marlijn is surprisingly taller than Jos.’

(20) *Spanish*

- a. Gabriel es *sorprendentemente* alto.  
 Gabriel is surprisingly tall  
 ‘Gabriel is surprisingly tall.’  
 b. Gabriel es *sorprendentemente* más alto que Tania.  
 Gabriel is surprisingly more tall than Tania  
 ‘Gabriel is surprisingly taller than Tania.’

(21) *Polish*

- a. Marcin jest *dziwnie* wysoki.  
 Marcin is strangely tall  
 ‘Marcin is strangely tall’  
 b. ?Marcin jest *dziwnie* wyższy od Ewa.  
 Marcin is strangely taller than Ewa  
 ‘Marcin is strangely taller than Ewa.’

(22) *Japanese*



*A unified account of degree surprisingly with bare adjectives and comparatives*

- a. Hiro-wa *odoroku-hodo* se-ga takai.  
Hiro-TOP surprise-degree height-NOM high  
'Hiro is surprisingly tall.'
- b. Hiro-wa *odoroku-hodo* Yuta-yori se-ga takai.  
Hiro-TOP surprise-degree Yuta-compared.to height-NOM high  
'Hiro is surprisingly taller than Yuta.'

(23) *Korean*

- a. Jayeon-un *emcheongnake* ki-ka kuta.  
Jayeon-TOP surprise-degree height-NOM high  
'Jayeon is surprisingly tall.'
- b. Jayeon-un Yong-puta *emcheongnake* ki-ka kuka.  
Jayeon-TOP Yong-compared.to surprise-degree height-NOM high  
'Jayeon is surprisingly taller than Yong.'

Thus, although our account focuses on English, these data suggests that a unified cross-linguistic account (along the lines of what we propose) is possible in principle.

## 6. Conclusion

This paper makes the novel observation that evaluative adverbs like degree *surprisingly*, when combining with the comparative construction, target a degree that equals the difference between the two individuals relative to a particular measurement—e.g., a difference in height. We propose a unified account of these adverbs when combined with bare adjectives and the comparative construction. Our account treats evaluative adverbs as degree morphemes (as done in the previous literature), which makes them similar to the positive degree morpheme *pos*. The proposal is, in principle, extensible to other languages where degree *surprisingly* shows the same distribution. It also emphasizes further the role of differential measurement in the comparative construction.

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Nguyen & Martínez Vera

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