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Degree Modification and Pluractionality in Puerto Rican Spanish

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Abstract. Puerto Rican Spanish has two modifiers, *bastante/enough* and *más/more*. These modifiers behave like the Spanish modifier *muy/very* in that they can modify gradable adjectives. However, these modifiers have an additional property. They are categorically flexible, in that they can combine not only with adjectives but also nouns and verbs. And when they modify verbs, plucational readings emerge. I show that these modifiers convey a multiplicity of pluractional readings that stem from the verb's lexical property. This property is possible because of a homomorphism between the event structure and the scale measuring it. Also, I show how these modifiers can be syntactically flexible. In the grammar, *más* and *bastante* bind to an event variable which determines its semantic. Lastly, I show that *más* and *bastante* the convey exclamative force.

Keywords. adverbs; semantics; syntax; gradability; pluractionality; Spanish

Resumen. El español puertorriqueño y estándar cuenta con dos modificadores, *bastante/enough* y *más/more*. Estos se comportan como el modificador *muy/very* en que modifica adjetivos gradables. Sin embargo, estos modificadores tienen una propiedad adicional. Son categóricamente flexibles, en que pueden combinar no solamente con adjetivos, pero también con sustantivos y verbos. Y cuando modifican verbos, surge unas interpretaciones de pluraccionales. Demuestro que estos modificadores codifican una multiplicidad de interpretaciones pluraccionales. Estas interpretaciones surgen de las propiedades léxicas del verbo cuyo están modificando. Esto es posible gracias a un homomorfismo entre la estructura del evento y la escala midiéndolo. También, demuestro como estos modificadores pueden ser sintácticamente flexibles. En la gramática, más y bastante se enlazan a una variable de eventos el cual determina su semántica. Por últimos, demuestro que *más* y *bastante* expresan fuerza exclamativa.

Palabras clave. adverbios; semántica; sintaxis; gradabilidad; pluraccionalidad; español

1 Gradability and Pluractionality

There has been an increasing interest in two apparently unrelated semantic phenomena in the recent semantic literature: gradability and pluractionality (Kratzer 2007, Lasersohn 1995, Yu 2003, Kennedy & McNally 2005, Morzycki 2012). Gradability is usually defined as a relation between an individual *x* and a degree *d* such that *d* is a value in the pertinent scale. A scale is formally defined as the tuple $< D, \delta, \succcurlyeq >$, where *D* is a set of degrees, δ a dimension, and $\succcurlyeq$ an ordering on *D* (Cresswell 1977). A real-life example of a scale would be an odometer, where we have a speed dimension and a set of degrees (speed values) ordered on that dimension. Gradability also comes into play in many scenarios, for example when an individual goes to a doctor and the doctor asks: *Tell me how your pain is from 1 to 10, 10 being the highest pain level*. It has been amply argued that gradability plays a critical role in the analysis of several linguistic categories and constructions. For example, an important subclass of adjectives are gradable adjectives, such as *tall* and *full*, as opposed to non-gradable ones, such as *dead*. Following Cresswell's insight, gradable adjectives can be claimed to have a degree argument, and are represented as follows:

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(1) a. Mary is tall ‘Mary is d in height’
b. $\lambda x.\exists d[d \in C \ \& \ tall(x,d)]$

On the other hand, pluractionality is usually characterized as a ‘multiplicity of actions, differing in time, spatial location, or participants’ (Lasersohn 1995). Pluractionality can be viewed as the expression of event plurality, which can be morphologically instantiated by a plural marker or not. Examples of pluractionality can be seen in distributivity, as in (2a), or in event pluralization, illustrated in (2b), where *a lot* is interpreted as an event pluralizer expressing 'a large number of (running) events'.

(2) a. Each person pushed a car.
b. Mary ran a lot. ‘Mary ran many times’
c. $[[PA]] = \lambda P.\lambda e{:}|e| > n[\forall e'.e' \leq e \ \& \ atom(e') \rightarrow P(e')]$

Pluractionality is usually formalized as in (2c) (Cable 2014), where it is stated that a pluractional expression (PA) is true iff there is a predicate *P* and an event *e* such that *e* is a plural event and every atomic member *e'* of *e* satisfies *P*, and the cardinality of *e* exceeds a contextually given number *n*.

As can be seen, gradability and pluractionality are usually characterized in quite a different fashion: Gradability is viewed as a relation between and individual and a degree value along a given dimension, and pluractionality as a plural property of an event. Morphologically, the former applies to adjectives and the latter to verbs. Thus, it would seem that there is no reason to believe that there is any relation between phenomena related to these two aspects.

Nevertheless, there is data from Puerto Rican Spanish suggesting otherwise. There are two degree modifiers, *bastante* 'a lot' and *más* 'more', in which these two properties interact significantly. These degree modifiers not only work in combination with adjectives but also with verbs and nouns. They behave in the same fashion as any other degree modifier (for example *muy* 'very') when they combine with adjectives (3a), but when they combine with verbs or nouns, they trigger readings that are not usually taken to be gradable (3b, 3c).

(3) a. Mary es bastante/más alta
Mary is a-lot/more tall
bastante: ‘Mary is very tall’
más: ‘Mary is extremely tall’
b. Mary corrió bastante/más ‘Mary ran a high/extreme amount of **times**’
Mary ran a-lot/more ‘Mary ran for a high/extreme **time**’
‘Mary ran a long/extreme **distance**’
c. Ese arbol tiene bastante/más manzanas
That tree has a-lot/more apples
bastante: ‘That tree has a large number of apples’
más: ‘That tree has an extreme number of apples’

Compared to Standard Spanish, in Puerto Rican Spanish, *más/more* and *bastante/enough* have multiple lives. When *bastante* and *más* combine with an adjective we get the standard degree reading. In (3a), Mary is tall to a degree which is judged by the speaker to be over the standard (modification by *bastante*) or beyond the maximal value in the considered scale (modification by *más*). An extreme reading is characterized by the degree of the property going beyond the maximal viable degree in

the context (Morzycki 2012). For example, in the case of (3a), if a speaker utters *Mary es más alta*, he is conveying that Mary's height goes *beyond* the largest (maximal) member in the considered scale in the context. When *bastante* and más combine with a verb (3b), a variety of pluractional-like readings emerge, indicating that these modifiers have a pluralizing effect on the verb. Nevertheless, *más* and *bastante* keep their gradable dependency on the context. (3b) with *bastante* can be understood as Mary ran beyond the standard in terms of duration, quantity or distance. In the case of (3b) with *más* it conveys an extreme reading, Mary ran beyond the maximal value in the considered scale in terms of duration, quantity or distance. When they combine with a noun, as in (3c). they also behave as plural modifiers of the noun. This use of *más* in Puerto Rican Spanish contrast with its use in Standard Spanish such as the comparative (4a) or superlative use (4b). When *más* is used in this way in Puerto Rican Spanish it requires a special pseudo-exclamative intonation.

(4) a. Ese carro es más rapido que el mio
That car is more fast than the mine
'That car is faster than mine'
b. Quiero el plato más delicioso que tengas.
I-want the dish more delicious than you-have
'I want your most delicious dish'

One of the main characteristics of pluractionality is that a multiplicity of varieties or dimensions can be associated with the relevant plurality of events, such as duration, repetitiveness, intensity, repeated occasions or events, persistent consequences, habitual agency, etc. (Cusic 1981). As shown in (5a) below, these Spanish degree modifiers are genuine pluractional markers, since they can convey these types of readings. At least with the verb *correr* 'run' considered above, the following varieties of pluractionality can be attested: iterativity, ('Mary ran a large amount of times'); duration ('Mary ran for a long time'), and distance ('Mary ran a long distance'). However, these different pluractional readings are deoendent on the dimension associated to the verb.

(5) a. Mary corrió bastante/más
Mary ran a-lot/more
'Mary ran for a long time.' TIME
'Mary ran many times.' QUANTITY
'Mary ran a very long distance.' DISTANCE

If we take the definitions of gradability and pluractionality at face value, these data are perplexing due to the fact that these degree modifiers seem to work as pluractional markers when combined with verbs and as quantity adverbs when combined with nouns. Thus, the following hypothesis can be entertained: (i) either these degree modifiers are ambiguous and have three different denotation or (ii) they have a unified semantics that can give rise to these different readings. The main argument in this paper is that there is a unified account for these modifiers and that (at least in Spanish) pluractionality can be accounted for as a special case of event gradability, thus providing evidence that events can be associated with gradability. In the last part of the paper we account for the extreme-degree properties of *más* in exclamatory contexts.

2 Pluractionality

Pluractionality was first characterized by Newman (1980) as multiplicity of action, that might involve participants, times or locations. Pluractional expression vary in readings cross-linguistically. For example, pluractional expressions can have readings like *repetitive, repeated occasion or event, persistent consequences, intensity, duration, distribution* and many others (Lasersohn 1995). To characterize pluractionals they are usually given the semantics in (6), where what it asserts that X is set of events and for that set to be pluractional every event on it must be a V event. To explain the multiplicity of readings available to pluractionals Cusic (1981) and Lasersohn (1995) posit four parameter that by interacting give us the different readings: (i) The event ratio parameter, (ii) relative measure parameter, (iii) connectedness parameter, and (iv) distributive parameter.

(6) $V - PA(X) \leftrightarrow \forall e \in X[V(e)] \,\&\, card(X) \geqslant n$

The event ratio looks at what level the repetition or plurarification occurs, —at the level of phase, occasion or event. For example, an event of running is an event consisting of many phases, that is, strides. On the other hand, if I say, 'John ran every Thursday', then this is the repetition at the level of occasions, there many occasions in which John ran. Lastly, if I say 'John jumped again and gain' this is a repetition at the level of events. So, a pluractional can pluralize the verb at the level of phases, occasions or events. In the case of our *más* and *bastante* the pluralizing is at the level of events. The relative measure parameter accounts the relative size of the event or events.

The connectedness parameter concerns, as the name implies, how connected are the multiplied events, phases or occasions. This parameter can range from totally unconnected, where the events are separated by days, years, to totally connected where the events are continuous or durative. According to these parameters, the durative reading of *más/more* and *bastante/enough* would be [+connected] and the repetitive reading would be [-connected]. The problem that I see with these parameters is that they would not account for the "distance" reading of *más/bastante.* The final parameter, the distributive parameter, concerns the distribution of the events, is it over space, time, or agents.

We could use these parameters to explain más and bastante. However, this would give us disjoint theory of these modifier. These parameters cannot explain the fact that these modifiers combine with multiple syntactic categories (adjectives, verbs and nouns) and cannot explain the gradable reading when it combines with adjectives or the plurality reading stemming from plural nouns.

One of the most interesting things about pluractional readings of the sort considered so far is that they are highly dependent on the properties of the event expressed by the verb. Consider the examples in (7). Here I am avoiding the extreme reading gloss for simplicity.

(7) a. Mary caminó bastante/más 'Mary walked many times'
Mary walked a-lot/more 'Mary walked for a long time'
'Mary walked a long distance'
b. Mary saltó bastante/más 'Mary jumped many times'
Mary ran a-lot/more 'Mary jumped for a long time'
'Mary jumped very high'
'Mary jumped a long distance'

c. John tocó la puerta bastante/más ‘John knocked the door many times’
John knocked the door a-lot/more ‘J. knocked the door for a long time’

In (7a) we have a walking event and the only pluractional varieties that can be associated with it are iterativity (‘Mary walked many times’), duration (‘Mary walked for a long time’) and distance (‘Mary walked a long distance’). On the other hand, the jumping event in (7b) may have all those mentioned interpretations plus one indicating height (‘Mary jumped very high’). Finally, a knocking-the-door event, as in (6c), has only two readings available: iterativity (‘John knocked the door many times’) and duration (‘John knocked the door for a long time’).

This contextual variation is to be expected since the determination of which component becomes the pluractional trigger is relative to the event in question. This was noted by Cusic (1981) and Lasersohn (1995), who stated that pluractional readings can be a function of context, aspect, tense or the event's own nature. As mentioned before, in the literature, these readings are usually characterized by Cusic’s (1981) parameters. The problem with Cusic’s and Lasersohn’s parameters is that they miss the dimensional and comparative characteristics of *más/bastente.* Notice that the pluractional readings of *más/bastante* are associated to dimensions such as distance, time, cardinality, height, etc. Cusic’s parameters are very important for understanding pluractionality in general and how different readings might arise. However, in this particular case it cannot account for the dimensional/gradable property of *más/bastante*. For this reason, we need gradability as I will explain in section 4.3.

3 Gradability of events

According to Kennedy and McNally (2005) there is a correlation between scale structures and event structures, which is homomorphic (structure preserving) from an algebraic perspective (Landman 1991). This comes from the fact that deverbal adjectives end up having a scale structure similar to that of the event structure of the verb they originate from. Incremental telics map onto closed scales and atelics map onto lower-closed scales. The reason for this difference resides in the fact that incremental telics have a natural endpoint, so they map onto closed scales, and atelics have no natural endpoint, which would explain why they map to lower-closed ones. Thus, there is a homomorphic relation between the minimal event and the minimal (degree) standard and between maximal events and maximal degree standards. This means, according to Kennedy and McNally, that some scale structures can be associated with scalar or gradable properties, namely atelics and incremental telics, whereas others cannot.

Nevertheless, this is not the only way to associate event structures with degrees; there is a more direct way to test these distinctions. According to Doetjes (2007), in French and many other languages there are degree modifiers that can modify not only adjectives but also verbs and nouns as can be seen in table 1. Type C modifiers can be used to modify adjectives, verbs and nouns:

Table 1. The degree expression continuum

<table>
<tr><td>I</td><td>adjectives</td><td>type A
very[E]</td><td rowspan="2">type B
erg[D]</td><td rowspan="5">type C
trop[F]
less[E]
minder[D]</td><td rowspan="3"></td><td rowspan="3"></td></tr>
<tr><td>II</td><td>gradable verbs</td><td rowspan="4">type D
beaucoup[F]</td></tr>
<tr><td>III</td><td>eventive verbs</td><td rowspan="3">type E
veel[D]</td></tr>
<tr><td>IV</td><td>mass nouns</td><td>type F
a mountain[E]</td><td rowspan="2"></td></tr>
<tr><td>V</td><td>count nouns</td><td>type G
many[E]</td></tr>
</table>

Thus, Spanish is not the only language having degree modifiers with the ability to combine with verbs and nouns, French has *trop*, English has *less* and Dutch has *minder*. One of the most interesting things about the Spanish modifiers *bastante/más* is that they provide independent evidence towards Kennedy and McNally's claim. Consider the following examples:

(8) a.Jany sabe bastante/más aleman — 'knows a lot of German words'
Jany knows a-lot/more German — 'his German is very fluent'
b. Jany nadó bastante/más — 'He swam a lot'
Jany swam a-lot/more
c. Jany saltó bastante/más — 'Jany jumped a lot'
Jany jumped a-lot/more

(9) a. Jany comió bastante/más de la galleta — 'J. ate much of the cookie'
Jany ate a-lot/more of the cookie
b. *Jany ganó bastante/más de la carrera — 'J. won a lot the race'
Jany wan a-lot/more of the race
c. *Jany llego bastante/más a su casa — 'J. arrived a lot to her house'
Jany arrived a-lot/more to her house

In terms of event structure, these modifiers can only combine with verbs expressing atelic events, be it a state (8a), an activity or a semelfactive (8b-c). They can also combine with verbs expressing incremental telic events (9a) but not with classical accomplishments or achievements (9b-c). This would follow from their nature as lower-closed scale modifiers, as when they combine with adjectives: *bastante alto* 'very tall', etc. Thus, event structure can be associated with scalar properties and these properties are shared across domains (adjectival and verbal). The behavior of *bastante/más* constitutes evidence for the claim that not only gradability is a more widespread phenomenon than previously thought, but that the association of verbs and even nouns with degrees can take place through modification and not just through morphological procedures, as is the case with deverbal adjectives according to Kennedy and McNally's original proposal.

A second important point, also originally raised by Kennedy and McNally, is that lexical categories (adjectives, verbs and nouns) have a semantic property in common that make them susceptible to gradability. This property is that they are measurable, i.e.

they express entities that can be measured along a dimension. For example, an action event can be measurable in terms of distance, duration, etc. Nouns can be measurable in terms of volume, number, mass, etc. (cf. Bach 1986a, 1986b). This brings us to an additional point. From the data considered so far, it can be inferred that verbs can be multidimensional, and they can be associated to a multiple number of dimension. This contrasts with gradable adjectives such as *tall* that can be associated to only one dimension (height). Verbs, on the other hand, are more flexible, as illustrated below:

(10) a. Ella saltó bastante Dimensions: height, times, duration, distance
she jumped a-lot
'She jumped very high/many times/for a long time/very far'
b. Ella caminó bastante Dimensions: times, duration, distance
she walked a-lot
'She walked for many times/for a long time/very far'
c. El tipo este tocó bastante a la puerta Dim: times, duration, force
The guy this knocked a-lot at the door
'This guy knock on the door many times/for a long time/ very hard'
d. El hombre este corrió bastante Dim: times, duration, distance, velocity
The man this ran a-lot
'This man ran many times/for a long time/ very fare/very fast'

For example, in (10a) *saltar* 'jump' can be associated with three dimensions: height, times and distance; while in (10c) *tocar a la puerta* 'knock' can be associated with times, duration, and force; and in (10d) *correr* 'run' with: times, duration, distance, velocity, which in the end give rise to the pluractional readings discussed in previous sections. This shows that when verbs are associated with gradability they do so through a a set of dimensions, which serve as the base for the relevant scale. Thus, dimensions and their expression are at the core of pluractional readings.

4.1 A Formal Model for event gradability and pluractionality

Degree modifiers are usually taken to be the morphological spell-out of an operator *pos* (Morzycki 2012), which indicates that the morpheme is positive, and introduces the standard of comparison. This operator is characterized in (11):

(11) $[[pos]] = \lambda P . \lambda x. \exists d[P(x,d) \& d \geq st(C)]$

The definition in (11) states that *pos* combines with a predicate expression *P* and an individual variable *x*, such that *x* is *P* to a degree *d* and *d* is higher than the standard of comparison introduced by the scale contextually under consideration. We will assume that degree modifiers such as *más*, *bastante* in Spanish or *very* in English are the expressions of a *pos* modifier, so they would have a semantic base such as (10). Nevertheless, this semantics only works with adjectives and does not capture the multiplicity of dimensions instantiated when the relevant predicate is of a verbal nature. In order to capture verb gradability, the relevant relation has to hold between an event and a degree. Thus, we propose event gradability models of the following sort:

Event models with degrees

I Set of individuals of type <e>
  S Set of scales: such that they are triple < D, δ, ≽>, D a set of degrees, δ a set of dimensions, ≽ an ordering on D
  D Set of degrees d, degrees are values that are isomorphic to the real numbers between 0 and 1.
  δ Set of dimensions (height, velocity, time, times, etc.), which can be a singleton.
≽ An ordering relation on D
∑ A set of events e of type <ε>
G A predicate of type <e,<ε*t*>>
  C A comparison class, a free variable whose value must be fixed contextually. A set of objects that conform to the δ in question.
  st A function that maps a set of objects unto a degree d and gives the standard

As stated above, it can be argued that *más/bastante* express a relation between a degree and an event. We provide two options for their characterization in (12):

(12) a. [[más/bastante]] = $\lambda e_{<\varepsilon>} . \lambda G_{<\varepsilon t>} . \exists d[d \geq st(C) \& G(e)(d)]$
  b. μ A set value function that maps an event onto a set of dimensions δ and give us the dimension of set of dimensions that conform to the event.
  c. [[más/bastante]] = $\lambda e_{<\varepsilon>} . \lambda G_{<\varepsilon t>} . d[\mu(e) = d \succcurlyeq_{\delta} st(C) \& G(e)(d)$

What (12a) states is that *más* and *bastante* are true of an event *e* and a predicate *G* iff there is a degree *d* such that *G* is true of *e* to *d*, where *d* is higher than a contextually-given standard of comparison *C*. This formulation would be fine as a straightforward extension of (11) in that it seems to give us what we first wanted, namely a relation between an event and a degree. This would be fine if events were one-dimensional like some adjectives but, as the evidence presented so far shows, they are clearly multidimensional and there are a variety of pluractional readings that only emerge in the presence of these modifiers. Thus, in order to really capture these facts, our proposal has to capture the idea that the dimensions are based on the nature of the event in question themselves. Following Schwarzschild (2002) and Nakanishi & Tomioka (2004), a measurement function μ is posited, as an operator from events to degrees. The dimension-oriented characterization of *más* and *bastante* is provided in (12b, c). It states that these operators, when applied to an event *e* and a predicate *G*, yield a true proposition iff, when *e* undergoes measurement through μ, the result we end up with a degree d, such that d is a value in the dimension δ and d is higher than the contextually-provided standard C along such dimension, and G is true of the event e to the degree d. Informally, what *más* or *bastante* do is to place the satisfaction of the relevant event requirements over an above-standard degree on a given dimension. Dimensions are also contextually determined and have to be consistent with the denotational requirements of the event, which would explain why some verbs can have two or three pluractional readings and others may even have more.

The μ operator establishes a constraint on the set of permissible dimensions and associates with each event a set of congruent dimensions δ; which dimension among the ones in δ is the right one is determined by contextual factors, such as Question under Discussion (Roberts 1996). This represents the idea that the dimensions are determined

in part by the event and in part by the context. In the end, this analysis assumes that flexible degree modifiers are event modifiers that take and event, return a degree along a dimension associated to the event type. According to Krifka (1989), events cannot be measured directly, and they are measured by objects/entities that are associated with them, such as time, distance, etc. In other words, the function μ has the role of specifying dimensions and, since events cannot be measured directly, μ measures the relevant event indirectly by taking a dimension that can be associated with it. There is a homomorphism *h* between events ∑ and the associated dimension, so the following holds $h(e_1 \cup_{\sum} e_2) = h(e_1) \cup_{\delta} h(e_2)$ where $\cup_{\sum}$ and $\cup_{\delta}$ are sum operations for events and dimensions (Nakanashi 2007). For example, there is a homomorphic relation between the progress of a 'run' event and the duration of the event, and there is also a homomorphic relation between the progress of a jumping event and the height of the jump. This means that at least an action event can be measured by virtue of its homomorphic relation with a dimension.

The idea that I want to advocate is that these flexible degree modifiers introduce a degree and a measuring function that give rise to different pluractional readings. This measuring function is vague in that it does not specify the dimensions or the readings by itself but is dependent on the nature of the event to give a measurement of the event and also on context in order to determine which dimension or reading is the one that is relevant or answers the question under discussion. A sample derivation is given in (13), where MOD (13a) is a variable for degree modifiers of type *C* (see table 1) such that it needs an event *e* of type *ε* and a predicate *G* of type <ε,t> and a predicate *G* of type <e,<ε,t>> (needs an individual and an event to return a truth value) to give a truth value. The column on the right makes the derivational steps explicit (A stands for 'assumption' and FA for 'function application').

(13) a. $[[MOD]] = \lambda e.\ \lambda G_{<\varepsilon,t>} \exists d[\mu(e) = d \succcurlyeq_{\delta} st(C) \ \&\ G(e)(d)]$ — A
b. $[[correr]] = \lambda x.\lambda e.correr(x)(e)$ — A
c. (e) — A
d. m — A
e. $[[MOD]](e) = \mathbf{\lambda e}.\lambda G.\exists d[\mu(e) = d \succcurlyeq_{\delta} st(C) \ \&\ G(e)(d)]\mathbf{(e)}$
⇨ $[[MOD(e)]] = \lambda G.\exists d[\mu(e) = d \succcurlyeq_{\delta} st(C) \ \&\ G(e)(d)(x)]$ — FA a, c
f. $[[correr]]([[m]]) = \lambda x.\lambda e.correr(x)(e)(m)$
⇨ $[[m\ correr]] = \lambda e.correr(m)(e)$ — FA b,d
g. $[[MOD(e)]]([[m\ correr]]) =$
$\mathbf{\lambda G}.\exists d[\mu(e) = d \succcurlyeq_{\delta} st(C) \ \&\ \mathbf{G}(e)(d)]\mathbf{(\lambda e.correr(m)(e))}$
⇨ $[[m\ correr\ MOD(e)]] = \exists d[\mu(e) = d \succcurlyeq_{\delta} st(C) \ \&\ \mathbf{\lambda e}.correr(m)(e)\mathbf{(e)}(d)]$ — FA f, e
⇨ $[[m\ correr\ MOD(e)]] = \lambda x.\exists d[\mu(e) = d \succcurlyeq_{\delta} st(C) \ \&\ correr(m)(e)(d)]$ — FA g

4.3 The association between plurality and gradability: homomorphism

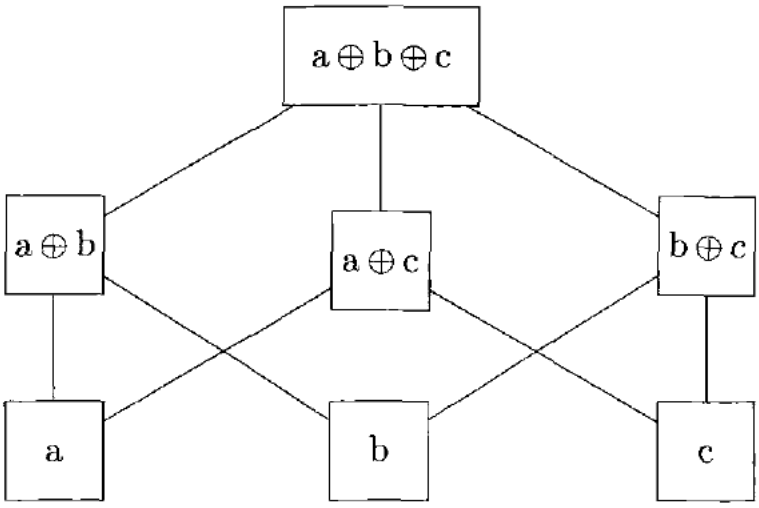
On the surface, there are no inherent reasons why plural expressions should have a natural relation with scales and gradability. Here the question is, how does *más* and *bastante* relate plurality with gradability? There is an intuitive idea that pluractionals quantify over non-mass objects, atomic sub-event that are multiplied or iterated; in contrast, degree quantification does not iterate a particular degree. Nevertheless, I will argue that there is a connection between pluractiobality and gradability. More specifically, the connection can be found in the plurality structure of events and how

they can map onto a scale that is homomorphic to it. Events have a substructure that mirror the scales that can measure it.

(14) The student built a boat

According to Bach (1986b) and Link (1998) plural events form a particular structure called a complete join semi-lattice. What this structure usually represents is the part-of structure of plural entities. Let's take an example, example (14) conveys that an individual that is a student did a process through time that culminated in a built boat. We can represent this process with an event variable *e* (Davidson 2006). This event variable represents the building a boat event from beginning to end. However, consider the process. We could divide the event into two phases. The process and the end event, as *pr(e')* and *end(e'')*. Similarly, we could divide the process in the start event, the process event and the end event, b(e'), pr(e'') and end(e'''). And so on. We could continue dividing it until we find the atomic events. Atomic events are events that cannot be divided anymore because they cannot be an instantiation of the verb in question. In reverse, if we add all the subevents we end up with the macro-event (e'+e''+e''' = e). That is, e', e'', and e''' are part of e (Moltmann 1997). Following this pattern, we can model the 'process' that an action undergoes through its development with event variables. More specifically, the part-of relation is modeled by the following structure:

Figure 1. Taken from Link (1998), figure 4c, page 65. 'part-of' relation within plural entities.

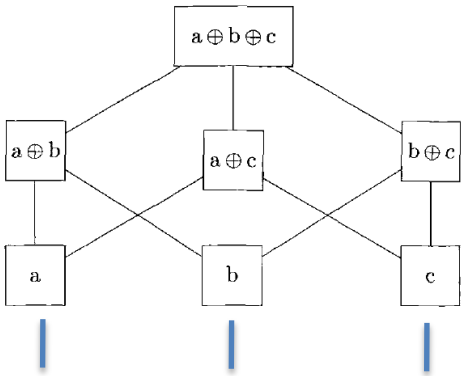


The top node is considered a plural entity. That is a+b+c is conceptually seen as one individual. Whereas a+b, a+c and b+c are plural entities that are part of a+b+c. Lastly a, b and c are singular entities, that are part of a+b+c. According to Link (1998), the bottom elements form an order that is homomorphic to temporal traces. That is:

(15) h(e' > e'') = h(e') > (e'') = t' > t''

Suppose that e is a swimming event and e can be divided into two separate events that precede each other as e' > e''. If we pair e' > e'' with the corresponding points in time it keeps the same structure, namely, t' > t''. Link calls this the Homomorphic Principle. Here I will argue that this idea can be applied to give a gradibility account of pluractionals.

Figure 2: Top figure taken from Link (1998) figure 4c, page 65. 'part-of' relation within plural entities. E, T, SP and Sc relations are posited by me. Underneath the lattice I show the homomorphic relation between the bottom elements and scales



E =	e'	<	e''	<	e'''
T =	t'	<	t''	<	t'''
Sp =	s'	<	s''	<	s'''
Sc =	1	<	2	<	3

In figure (2) the reader can see that the bottom elements of the lattice, if ordered, have the same structure as the (i) sequential line of events, (ii) its time points, (iii) the points in space and (iv) its count. In the figure, E is the set of events, T the set of points in time, Sp the set of points in space and Sc is the set of natural or real numbers - all of them ordered. Figure (2) depicts how the μ function relates plural events to scales. It establishes a homomorphic function from the ordered events to its associated scale. Given the preceding statement, the following equivalencies in (16-19) will hold (this list is not exhaustive). According to the relations, we can relate scales to events in any number of ways due to our homomorphic measure function μ. In (16) μ measures an event through its correlation with space points (distance interpretation). In (17) we can measure those space points dues to its correlation with time points (durative interpretation). Lastly, we can model these homomorphic relations with a numeric scale (18). The numeric scale represents the iterativity interpretation. Examples (16-19) show that plural events, or otherwise called pluractionals, can be mathematically associated to scales through a homomorphic measurement function.

(16) $\mu(e' < e'') = \mu(e') < \mu(e'') = s' < s''$
(17) $\mu(s' < s'') = \mu(s') < \mu(s'') = t' < t''$
(18) $\mu(s' < s'') = \mu(s') < \mu(s'') = 1' < 2''$
(19) $\mu(e' < e'') = \mu(e') < \mu(e'') = 1' < 2''$

According to the rationale laid out in this section, a plural event can be related to scales because we can establish a mirror-like relation between the bottom events and a scale. Wellwood (2015) provided a similar explanation for verb comparisons. The measurement function that I proposed returns a degree. Following figure 2, we posit

that the measurement function is a homomorphic function between the plural event structure and a scale (20).

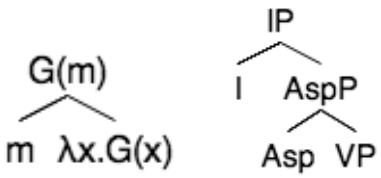
(20) μ(e' < e'') = μ(e') < μ(e''), such that μ(e') is in a scale.

The pluractionals *más* and b*astante* have a requirement: the scale in the different pluractional readings have to be homomorphic to its event structure. The homorphic requirement gets rid of any interpretation that is not compatible with the event. For example, I speaker cannot measure with *height* an event in which some body runs because the event is not homomorphic to the scale of *height.*

5 A syntax for event gradability and pluractionality

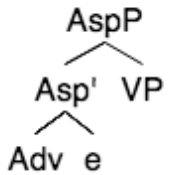
The above semantic consideration needs to be supplemented by an interface perspective, in which it is shown how semantics interacts with syntax, within a generative perspective. Following Hacquard (2010), we will assume that event arguments are projected in the syntactic representation. Every mother node is the result of a merger operation (and function application in the semantic derivation, cf. Heim & Kratzer 1995). The structural projections assumed are an Inflectional Phrase (IP), an Aspect Phrase (AspP) and a Verb Phrase (VP) (second tree in Figure 3). The AspP is the syntactic locus where the situation type, the aspectual viewpoint (Comrie 1976) and the event argument are hosted (Kratzer 1995). As usual, IP is where the inflectional information is found, such as tense, and is normally labeled as the TP projection within the Minimalist Program.

Figure 3. Assumed configurations



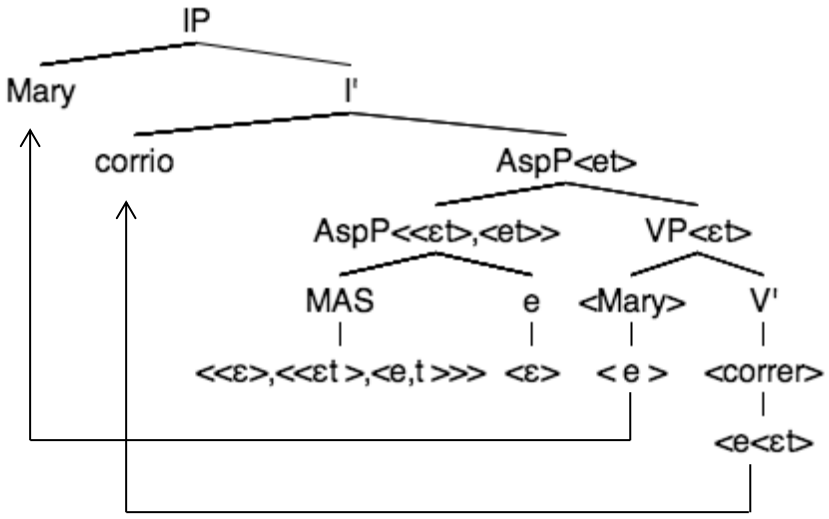
These two assumptions will give us the right structure for a standard sentence such as *El gato corrió* 'The cat ran' but not for a sentence with an adverb such as *más* or *bastante*, such as *Mary corrió más*. We will assume that the Adverb Phrase (AdvP) headed by the degree modifier adjoins to AspP as in figure 4, given that the event argument is projected at the Aspect Phrase level, and this argument is bound by the degree adverbs under consideration (Kratzer 1995):

Figure 4. Derivation



In figure 5, the entire compositional derivation is provided:

Figure 5. Complete derivation



The verb *correr* 'run' takes *Mary* as its argument and returns a VP of type <ε,t>; then an adverb such as *más* or *bastante* is adjoined to the AspP which takes the event argument of that phrase and returns a modifier (AspP) of type <<ε,t>,<e,t>>. This modifier takes the VP <ε,t> as argument and returns an AspP of type <e,t> and eventually this phrase takes Mary as an argument an returns a truth value. Following the standard derivational account, V moves to the head of TP/IP for feature-checking purposes and Mary moves to the Spec of TP/IP to check nominative case. In figure 5 the semantic types show the homomorphism between the syntactic derivation and the semantic derivation. That is, the syntactic derivation goes in parallel (mirrors) with the semantic derivation.

Note that the adverb could have been adjoined directly to the verb phrase, but this would have left the adverb without an event argument and there would have been a type mismatch. The idea behind having the adverb adjoined to the AspP is that adverbs usually have aspectual information that correlates with or restricts the aspectual information of the AspP; for example, *slowly, always, often*, etc. contribute additional aspectual information to the information provided by the event verb (Cinque 2003; Travis 2008). Thus, it seems like the most natural hypothesis is to claim that AdvPs headed by *más* and *bastante* are adjoined to the AspP, since they clearly have an impact on aspectual information and, as argued before, trigger pluractional readings which are clearly based on aspectual event content.

6 Extreme Reading and Exclamative Force

As was stated at the beginning of the paper, the modifier *más* can also trigger a subset of degree-related readings that can be characterized as 'extreme'. Typically, these readings are associated with exclamative intonation:

(21) a. ¡María es más alta!
María is more tall
'María is soooo tall!'
b. ¡María corrió más!
María ran more
'María ran sooo much/fast!'

It can be argued that the modifier *más* is also associated with the expression of exclamativity. Exclamatives have been claimed to encode four properties: i. they have exclamative illocutionary force, ii. this illocutionary force forces an extreme degree reading, iii. the standard of comparison and considered scale is dependent on the speaker's expectations and iv. the speaker conveys an emotion towards the fact that the degree goes beyond his expectations (Gutiérrez-Rexach 1996). Consider (22):

(22) a. ¡Qué alta es Maria!
'How tall María is!'
b. ¡Qué rápido corrió María!
'How fast María ran!'

The exclamatives in (22) convey that 'The speaker expresses his/her attitude or emotion (amazement, surprise, etc…) towards the fact that Maria is *d*-tall (or runs *d*-fast) and *d* goes beyond (in the scale of height/speed) what the speaker expected (where what the speaker expected is a standard of comparison and a considered scale)'. Here we will follow Morzycki (2012) in his characterization of extremeness, where for this property to emerge the degree under consideration has to go beyond the relevant scale. Both the standard and the scale are anchored to the speaker's expectations and the speaker expresses an emotion towards the fact expressed by the embedded proposition. Thus, no matter whether the degree applies to a property or an event, *más* will play a similar role.

We are thus claiming that the extreme-degree property is not exclusive of exclamatives *per se* but also shared by some extreme degree modifiers such as *demasiado* 'too much' or *más* in the readings described in this section. For example, *más* and *demasiado* are also associated with an extreme reading in (23a, b) where these sentences convey that '*x* is d_{δ}-tall/d_{δ}-jumped and d_{δ} goes beyond the considered scale'. We reiterate that in order to get this reading with *más* a special pitch accent/exclamatory contour has to be placed on the modifier, whereas *demasiado*, being an intrinsic extreme degree adverb does not require such prosodic marking.

(23) a. Ella es más/demasiado alta
'She is too tall'
b. Ella saltó más/demasiado
'She jumped too much

This association with extreme degree can be corroborated when the relevant implicature is contradicted, by explicitly stating that the degree stayed within the normal range as in (24), which results in an infelicitous sentence.

(24) a. #Ella es más/demasiada alta pero lo normal.
'She is too tall , but of anormal height"
b. #Ella saltó más/demasiado pero lo normal.
'She jumped too high, but the normal amount'

Another interesting property relating standard exclamatives and constructions with the modifier *más*, is that in exclamative sentences it has been argued that the adjective moves to the left periphery to check exclamative force and [+degree] as in (25):

(25) a. ¡Lo alta que es tu hermana!
b. ¡Qué alta es tu hermana!
'How tall your sister is'

This property is also shared by extreme degree modifiers like *más* and *demasiado* (26a-b), especially in certain dialects such as Caribbean Spanish (González-Rivera & Gutiérrez-Rexach 2010):

(26) a. Demasiado/más alta que es la muchacha.
'Too tall that is the girl'
b. Demasiado/más que saltó la muchacha.
'She jumped so high!'

Also, as can be seen in (27), if a *wh*-determiner is inserted, the resulting sentence is ungrammatical due to the fact that there is a conflict in the checking of the [extr.deg] feature. In other terms, the position of Specifier (Spec) in the Complementizer Phrase (CP) is already occupied by *demasiado* or *más*.

(27) *¡Qué demasiado/más alta es la muchacha!
'How to tall that is the girl!'

Another relevant shared property is that standard exclamatives and *más/demasiado*-structures are both dependent on the speaker's expectations. For example, (25) and (26) would be true in a situation where speaker expected Maria to be around 5'4" but turns out that she is 6 feet tall and, by going beyond the speaker's expectations, an extreme reading is conveyed. This why an adverb that conveys on agreement on expectations, such as *razonable* 'reasonable', is not allowed in contexts where the degree exceeds the speaker's expectation.

(28) a. ?? ¡Qué razonable es el dinero que tiene ese hombre!
'How reasonable it is the money that man has!'
b. ¡Qué alto es ese hombre! #Lo esperaba asi
'How tall that man is! As I expected.'

Likewise, in (29a, b) expectation-agreement predicates are not allowed with *más/demasiado*, in the dialects where the construction is possible with high-expectation predicates (30).

(29) a. *Es razonable lo demasiado/más que corrió.
'It is reasonable the extreme distance he run'
b. *Es razonable lo demasiado/más alto que es.
'It is reasonable how extremely tall he is'
(30) a. Es increíble lo demasiado/más que corrió.
'It is incredible the extreme distance he run'
b. *Es increíble lo demasiado/más alto que es.
'It is reasonable how extremely tall he is'

In fact, as is shown in (31), stating that the degree is the one that we expected results in anomaly:

(31) #Ella saltó más/demasiado pero era lo que esperaba.
'She jumped too high but it was what I expected'

This is due to the fact that the modifiers under consideration are also anchored to the speaker's expectations and a sentence such as (31) conveys that '*x d*-jumped and *d* goes beyond the speaker's considered scale' and this in turn triggers an emotive attitude like exclamatives thus making our modifiers convey 'The speaker expresses his/her emotive attitude (surprise, admiration, repulsiveness, etc…) towards the fact that *x* is *d*-tall or *d*-jumped and *d* goes beyond the speaker's considered scale'.

Following Gutiérrez-Rexach (1996) and Grosz (2011), it can be assumed that exclamative force comes from an illocutionary operator EXC defined as follows:

(32) a. Let *a* be the speaker, *w* a world, *p* a proposition, *(a)exp* the speakers expected scale and $P \in EMOT$ (the set of emotive properties).
b. Then EXC = $_{df}\lambda a_i.\lambda w_s.\lambda p_{<st>}.\exists P_{<s,<st>,<et>>}[P(a)(w)(p \,\&\, d_{\delta} \succcurlyeq \max(C_{(a)exp})])$
'There is an emotive attitude P expressed by speaker *a* in world *w* towards the fact that *p* and *d* goes beyond the speaker's considered scale'

Recall that the modifier *más*, as defined in (33), is a measuring function for events with a degree that goes beyond the standard of comparison (whatever that might be).

(33) $[[más]] = \lambda e.\lambda G_{<et>}.\exists d[\mu(e) = d_{\delta} \succcurlyeq st(C) \,\&\, G(e)(d)]$
'There is a degree d such that by measuring e we get a dimension for d and d is higher than the standard of comparison and e is G'

This is adequate for capturing the 'standard' pluractional readings of *más*, namely those in which the degree referred to is non-extreme. Nevertheless, it does not explain the extreme/ exclamative readings considered in this section. What is needed is the reasonable claim that there is and exclamative operator along with these modifiers that contribute to the mentioned exclamative interpretations, an operator whose presence is also "read off" at the prosodic interface as described above. This operator will combine compositionally with the measured proposition as in (34)

(34) $\lambda p.\exists P[P(a)(w)(\exists d,e[p(w)(d) \,\&\, \mu(e) = d_{\delta} \succcurlyeq st(C) \,\&\, d_{\delta} \succcurlyeq \max(C_{(a)exp}])$
'Give me a proposition p and I will return the statement: there is an emotive attitude P that is held by speaker a in world w towards the fact that m d_{δ}-p (where δ is the corresponding dimension) beyond his expectations'

Thus, the interpretation of a sentence such as (35) would be (36)

(35) ¡María corrió más!
'María ran extremely'

(36) $\exists P[P(a)(w)(\exists d,e[correr(m)(e)(d) \,\&\, \mu(e) = \delta \,\&\, d_{\delta} \succcurlyeq st(C) \,\&] \,\&$
$d_{\delta} \succcurlyeq \max(C_{(a)exp})]$
'There is an emotive attitude P that is held by speaker a in world w towards the fact that m d_{δ}-ran (where δ is the corresponding dimension) beyond his expectations'

This characterization also correctly predicts that pluractionality is preserved under the relevant extreme-degree readings. In other words, the exclamative/extreme interpretation of the modifier *más* is compatible with any dimension under which the relevant event can be measured. For example, the formula in (36) still has several pluractional readings: 'María run fast to a degree exceeding the speaker's expectations'; 'María run a distance exceeding the speaker's expectations'; 'María run a time interval exceeding the speaker's expectations'; etc.

7 Conclusion

In this paper it has been argued that degree modification is closely related to pluractionality. The reason they are related is because there is a similarity between the structure of scales and the structure of plural events. More specifically, pluractional readings can be given a degree-based semantics and these readings emerge from measurable dimensions related to the aspectual structure of verbs. These dimensions are given by a measuring function related to the homomorphic relation between certain dimensions and events. In addition to the role played by the aspectual nature of the verb, contextual information also plays a role. Overall, the proposals in this paper lend to Kennedy & McNally's and Doetjes's claims that gradability is a widespread phenomenon that encompasses other categories besides adjectives. In the case under consideration here, events are associated to a dimension and a degree by virtue of being introduced by a degree modifier. We also argue that this process takes place compositionally and provided explicit parallel semantic and semantic derivations. Finally, we argue that there are exclamative/extreme degree interpretations that are also consistent with the pluractional interpretation.

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