MEASURE PHRASES AND THE SYNTAX OF ROMANIAN NOUNS AND ADJECTIVES

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Abstract: The paper examines the syntax and interpretation of measure phrases (=MPs) inside Romanian DPs and APs. The MP construction is trans-categorial, so that an understanding of its semantic properties is welcome. Following Schwarzschild (2006), we suggest that MPs are means of measuring out *monotonic dimensions* in the lexical structure of adjectives, nouns, PPs, etc. Monotonic constructions constitute *a family*, prototypically represented by the cardinal numerals, but also by partitive and pseudo-partitive constructions. The existence of shared formal elements in all monotonic constructions suggests the presence of a shared functional category, called the Mon(otonicity) P(hrase). Its head, Mon^0 relates a lexical category in its complement with a MP in its specifier. Not all MPs receive a partitive monotonic interpretation. The interpretation of MPs inside DPs shows a difference between *Partitive MPs*, which track monotonic dimensions of objects (*doi centimetri de sfoară* 'two centimeters of rope'), and *Attributive MPs,* which describe dimensional non-monotonic properties of objects (*găleată de zece litri* 'ten liters bucket'). In the second part of the paper, a detailed description of the internal structure of DPs and APs which contain MPs is given, starting from the premise that the two interpretations of the MP, partitive and attributive, respectively, might correspond to two different configurations.

Keywords: measure phrases, monotonic constructions, partitivity, dimensional nouns, (in)direct measure phrase modification.

1. Stating the problems

It is widely known that gradable adjectives may combine with Measure Phrases (=MP cf. Matushansky 2002a, 2002b); yet, gradability is not sufficient to guarantee a well-formed combination of a MP and an Adjective, as shown below:

(1) a. *Zidul este înalt de trei metri*.
wall.the is tall of three meters
'The wall is three meters tall.'
b. *Apa era adâncă de doi metri*.
water.the is deep of two meters
'The water was two meters deep.'
c. **Metalul este cald/fierbinte de 200 de grade*.
metal.the is warm/ hot of 200 of degrees
'The metal is 200 degrees warm/ hot.'

Thus, not all gradable adjectives select a MP, even if the adjective refers to a dimension (such as temperature in 1c) for which there are conventionally established units of measure. On the other hand, not only adjectives but also other lexical categories (nouns, prepositions, verbs) may select MPs, as has been known for a long time (Ross 1967, Jackendoff 1977).

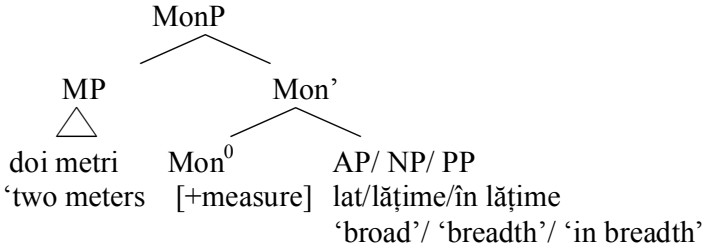
(2) a. *A mers doi paşi* ***la*** *stânga*.
'He went two steps to the left.'
b. *A* ***mers*** *zece kilometri.*
'He walked ten kilometers.'

(3) a. *Zidul are o **înălțime** de trei metri.*
'The wall has a height of three meters.'
b. *Apa are **2 metri** adâncime.*
'The water has a two meter's depth.'

The fact that MPs occur with all lexical categories indicates that measure-phrase selection is a *semantic property*. What has been said so far allows us to formulate the two problems that this paper will be about. The first problem is semantic; one should understand what kind of properties are described by MPs. This will allow one to understand, for instance, which gradable adjectives license MPs, therefore, what is the source of the contrast between (1a-b) and (1c) above. The second problem is syntactic, namely what is the syntactic structure of the APs and NPs/DPs which contain MPs.

In discussing these problems, we suggest that MPs are means of measuring out *monotonic dimensions* (cf. Schwarzschild 2005, 2006) in the lexical structure of adjectives, nouns, PPs, etc., that is, dimensions dependent on the part-whole structure of the denoted entity. Natural languages dispose of a number of constructions meant to characterize monotonic (conceptual) dimensions, in contrast to non-monotonic ones. Monotonic constructions constitute *a family*, prototypically represented by the cardinal numerals, but also by the partitive and pseudo-partitive constructions, both of which share important formal characteristics with the cardinal numerals; compare: *două sute de studenți* (two-hundreds of students), *două grupe de studenți* (two groups of students), *două dintre grupele de studenți* (two of the groups of students). We claim that MPs inside APs and other types of phrases also *instantiate monotonic constructions*. The existence of shared formal elements in all of the monotonic constructions suggests the presence of a shared functional category, which, following Schwarzschild (2006), we will call the Mon (otonicity) P(hrase). Its head, Mon^0 relates a lexical category, as its complement, with a MP in the specifier, as shown in (4). The head "projects" the relevant monotonic dimension in the conceptual make-up of the complement onto the specifying MP.

(4)



The second specific semantic property of MPs is that they predicate about *sets of degrees* or Intervals. Only those lexical heads which may be conceptualized as making reference to Intervals felicitously combine with MPs. It is the second property which is responsible for the manner in which the grammar of MPs combines with the lexical and morpho-syntacitc properties of adjectives and nouns.

The outline of the paper is as follows. In sections 2-3, on the basis of a comparison between the comparative and the positive degree regarding their ability to select MPs, it appears that only gradable adjectives which may refer to sets of degrees (=Intervals) accept MPs. In section 4, on the basis of an investigation of the interpretation of MPs inside noun phrases, we show that not all MPs receive the same interpretation. There is an important difference between *Partitive MPs*, which track monotonic dimensions of objects, and

Attributive MPs which describe dimensional non-monotonic properties of objects. This contrast has important formal correlates in the syntax of NPs containing MPs. Thus Partitive MPs share the formal properties of other partitive constructions; secondly, the possibility for a noun to appear in a measure-phrase partitive construction also depends on countability. Uncountable nouns and plurals have monotonic dimensions and combine with MPs in measure phrase pseudo-partitive constructions (*doi centimetri de sfoară*, 'two centimeters of rope'), while countable singular nouns, which have fixed (non-monotonic dimensions) reject the measure-phrase pseudo-partitve (**zece litri de găleată* 'ten liters of bucket'), but are compatible with attributively used MPs (*găleată de zece litri* ' ten liters bucket').

In sections 5 and 6 we present a detailed description of the internal structure of DPs and APs which contain MPs, starting from the premise that the two interpretations of the MP, partitive and attributive respectively, might correspond to two different underlying configurations. Thus in monotonic MP constructions, the MP is part of the extended projection of the lexical head, merging as the Specifier of the MonP, as in (4). In contrast, the attributive MP is an ordinary nominal modifier. The analysis proposed here is non-unitary, differing thus from the elegant unitary predicational analysis proposed by Corver in a series of important papers. It will be seen that by adopting a semantic perspective, which leads to two basic configurations, rather than one, the proposed syntax is much simpler than Corver's, retaining a good empirical coverage.

2. Measure phrases as a modifiers of the adjective

Most semanticians (Higginbotham 1985, Matushansky 2002a, 2002b, Schwarzschild 2005, 2006, Zamparelli 1993, 1995, Kennedy 1997, 2001 a.o.) agree that the a-structure of gradable adjectives includes a non-thematic *degree argument* in addition to their thematic arguments. The degree argument is non-thematic in as much as it cannot be externalized as a regular DP argument. Gradable adjectives are thus usually defined in terms of their a-structure:

(5) An adjective is defined as *scalar (gradable)* if it has an argument of type <d>. The degree argument is non-thematic.

The semantic type of a binary gradable adjective like *proud* in (2) now becomes <e, < d, <e, t>>, while a one-place gradable adjective like *tall, deep* will be of type <d <e, t>>. The denotation of *proud* in (6a) becomes (6b), in accordance with its denoting a relation between individuals and degrees.

(6) a. John is proud of his son.
b. || **proud** || = $\lambda x \in D_e\ \lambda y \in D_e$ and $\lambda d \in D_d$ and λy is *d*-proud of x (i.e. proud (x) =d)

The degree argument of the adjective, like the event argument of the verb, is not externalized by means of a DP, but it may be bound by a degree operator. Indeed, the presence of the degree variable is visible when there is an appropriate modifier like *prea* 'too', *destul* 'enough' *foarte* 'very, etc. which binds the degree variable (7a, b), and also when the adjective occurs in a degree construction, such as the comparative one (7c).

(7) a. Ion este *prea* mândru de acest proiect.
'Ion is too proud of this project.'

b. Prezentarea este *destul* de detaliată (pentru a fi înțeleasă de toți).
'The presentation was detailed enough (to be understood by everybody.'
c. Ion este *mai* înalt ca Petre.
'Ion is taller than Petre.'

An important property of scalar predicates is *monotonicity*, defined in (8): *Scalar predicates are monotone*, because if a scalar predicate holds to a degree (i+ j), it also holds to any lower degree (i). Consider age, which is a monotonic property. Thus, if a dog is ten years old, it is automatically true that that dog is also nine years old, eight years old, etc. Monotonicity is an essential component of inferences based on scales.

(8) *Monotonicity*
A function f of type < d < e, t>> is monotone iff ∀x ∀d ∀d' [f (d) (x) = 1 & d'< d → f (d') (x) = 1

Coming back to the degree variable, technically, one way of assigning an interpretation to the degree variable in the structure of the adjective is *binding it by a degree operator* like *prea* 'too', *destul* 'enough' *foarte* 'very', or the comparative *mai*, 'more'. A second possibility is to *interpret it by means of MP*. Two proposals have been made as to how to implement this.

Alternative 1 is to interpret the MP simply as a saturator (an admissible value) of the degree variable. Such an analysis is adopted by Matushansky (2002a, 2002b). In her analysis, the MP *2 metri* 'two meters' in (9b) serves as *an argument of the adjective*, saturating the degree-place in the relation *înalt* 'tall'<d<e, t>> expressed by the adjective. The combination is interpreted via function-application. In sum, the degree variable of the adjective is either bound by a degree operator or, alternatively, *saturated* by a MP:

(9) a. Ion este *foarte/prea* înalt.
'Ion is very /too tall.'
b. Ion este inalt de *2 metri*.
'Ion is two meters tall.'

This view, however is problematic. Recall that the degree argument in the structure of the adjective, like the event variable in the structure of the verb is non-thematic and *non-thematic arguments are so-called because, in principle, they can't be saturated by noun phrases*. In the taxonomy of Higginbotham (1985), degree arguments, like event arguments, are *theta-identified or theta-bound, but are not discharged by theta marking*. The suggestion that MPs saturate the degree variable is thus theoretically problematic. Secondly, probably more seriously, there are empirical problems for this view. In the first place, not any semantically plausible DP/NP may saturate the degree variable. Thus, *înălțimea lui Ion*, 'Ion's height' is semantically a MP, yet it cannot saturate the degree variable in the structure of the adjective *tall / înalt*:

(10) a. Bill are *înălțimea lui Ion*.
'Bill has Ion*'s height*.'
b. *Bill este înalt de *înălțimea lui Ion*.
*Bill is *Ion's height* tall

The difficulty is syntactic, since the idea itself may be expressed as a comparative in both languages: *Bill is as tall as Ion*. / *Bill este înalt cât Ion*. The main empirical problem, however for the view that the MP is a saturator of the degree variable is that it has difficulty in accounting for the different behavior of the adjectives in (1a-b) and (1c). It is not clear how to state or characterize this difference, since all the adjectives in (1) are scalar and monotonic.

Alternative 2, defended in Schwarzschild (2005), is to analyse *MPs as modifiers*. They do their work as predicates on the non-thematic degree arguments, just as Davidsonian adverbs do their work as *event*-predicates. Under this approach, in order to account for the difference between (1a-b), and (1c) one may subcategorize gradable adjectives according to some property, which would actually license the direct combination with a MP. This is the strategy adopted below, following Schwarzschild (2005). *Degree arguments are treated as functional elements*; realized in the functional domain of the scalar predicate. As to the MP, syntactically, it will be a specifier or an adjunct of a *functional category*, rather than an argument of the adjective. Semantically it is a *predicate* whose subject is the degree variable. It is this subject-predicate relation that is mediated by the Monotonicity Phrase in (4) above.

3. The distribution of measure phrases in APs

3.1 Measure Phrases as direct/ indirect adjectival modifiers

Before we go any further, let us introduce some terminology. Adjectives which can be modified by MPs in the positive degree will be said to allow *direct measure phrase modifiers*, as in *two feet tall*. Adjectives which combine with MPs only in the comparative or in the *prea/too* construction will be said to have *indirect measure phrase modifiers*, because the presence of the MP is mediated by the comparative operator or the degree operator *prea/too*. Compare, *20 degrees hotter*/**20 degrees hot*.

Examining the distribution of MPs with adjectives, a sharp systematic asymmetry comes out: 1) In both Romanian and English, only very few adjectives directly combine with the MP. b) In both languages *all* comparatives and *all prea/too* constructions allow modification by the MP. Generally, if a language has *direct measure phrases*, it will have *indirect measure phrases*, but not vice versa. As shown in the literature, in languages like Spanish and Russian (Matushansky 2002a), adjectives allow only indirect measure phrase modification. The examples below prove that in both English and Romanian, only a limited number of adjectives occur with MPs, even if the two languages employ different syntactic constructions.

(11) acceptable measure phrases in AP
English a. five feet tall
b. two milimiters deep
c. two centimeters thick
Romanian a. înalt de cinci picioare
b. adânc de 2 milimetri
c. gros de 2 centimetri

(12) unacceptable measure phrases in AP
English a. *30^0 hot/ cold/ warm
b. *200 pounds fat/thin
c. *50 decibles loud/ soft
d. *40 square meters large

Romanian a. *rece /cald de 20 de grade
b. ??gras de 200 de kilograme
c. *(o muzică) tare/*zgomotoasă de 50 de decibeli
d. *mare/întins de 4o de metri pătrați

The data in (11) - (12) show that direct modification by an MP is *lexically conditioned* in both languages. While this variation is lexical, it is not un-systematic; one should understand what it is in the semantics of the comparative and of the *prea/too* construction which guarantees their compatibility with the MP, since the same property is likely to characterize those adjectives which accept MPs in the positive degree. Examine the following contrast between the comparative and the positive degree of the same adjectives in construction with MPs:

(13) a. Ion este doi centimetri mai înalt ca mine.
'Ion is two centimeters taller than me.'
b. Ion este înalt de doi metri.
'Ion is two meters tall.'

(14) a. Metalul este (cu) zece grade mai fierbinte acum.
'The metal is (by) ten degrees hotter now.'
b. *Metalul este fierbinte de 100 de grade.
'The metal is 100 degrees hot.'

(15) a. Ion este (cu) zece kilograme mai gras ca Petre.
'Ion is (by) ten kilos fatter than Petre.'
b. ??Ion este gras de 150 de kilograme/*150 de kilograme gras.
Ion is fat of 150 de kilos/ 150 kilos fat
'Ion is 150 kilos fat.'

(16) a. Această suprafață este cu 200 de metri pătrați mai mare.
this surface is by 200 sqaure meters larger
b. *Această suprafață este mare de 200 de metri pătrați.
this surface is large of 200 of meters square
'This surface is 200 square meters large.'

(17) a. Acest apartament este (cu) 3 milioane mai scump decât celălalt.
'This apartment is (by) three million more expensive than the other.'
b. *Acest apartament este 300 de milioane de scump.
this apartment is 300 of millions of expensive
'This apartment is three hundred million expensive.'

(18) a. Astăzi este (cu) zece grade mai cald decât ieri.
'Today (it) is (by) ten degrees hotter than yesterday.'
b. Astăzi este (cu) zece grade **prea** cald ca să putem ține examenul.
'Today (it) is (by) ten degrees too hot to hold the exam.'
c. *Astăzi este cald de 30 de grade.
today is hot of 30 of degrees
'Today it is 30 degrees hot.'

We conclude that Romanian regularly allows *indirect modification of a comparative by a measure phrase*, but the MP is often disallowed for the positive degree of the same adjective, that is, direct modification of an adjective by a MP is often unacceptable. On the strength of this evidence one may conclude that the meaning of the MP makes it suitable as a

modifier in comparatives, but its meaning is such that a MP cannot directly predicate of the degree variable of the adjective. The question that should be raised now is what in the semantics of the comparative and of the *too/prea* constructions makes them compatible with MPs.

3.2 The comparative: measure phrases are predicates of Intervals (gaps)

An examination of the examples above shows that what the MP is about in comparative constructions is *the gap* (the distance) between the (maximum) degree to which a property holds of the first object and the (maximum) degree to which the same property holds of the second object. This suggests that MPs predicate on *sets of degrees*, on *gaps* or *intervals*, not merely of degrees. If John is taller than Mary by two inches, then John's height exceeds Mary's height by two inches, i.e., two inches denotes that gap that spans form Mary's height up to John's height, and the MP is a predicate giving that size of the gap. More technically:

(19) John is taller than Mary
$\exists h_j \exists h_m$ tall (j, h_j) & tall (m, h_m) & ($h_j > h_m$)

(20) a. John is taller than Mary by two inches.
b. $\exists h_j \exists h_m$ tall (j, h_j) & tall (m, h_m) & 2 inches ($h_m \rightarrow h_j$)

($h_m \rightarrow h_j$) denotes that gap that spans from Mary's height up to John's height, and the measure phrase is treated as a predicate giving that size of the gap.

If the function of a MP is to describe a gap on a scale and comparatives necessarily entail the presence of a gap, it is not surprising that they fit together so snugly. The same is true about the *prea/ too* construction. To say that *Ion este prea bătrân ca să lucreze/ John is too old to work* is to say that there is a non-empty gap between John's age and the cut off point for working. The representation of the comparative in (19), (20) should also take into account the fact that adjectives are monotonic functions. Thus, in saying that a tree is three meters tall one indicates the *maximum degree of tallness* of the tree, and given that *tall* (d, x) is a monotonic function, it is satisfied by the set of all degrees of tallness that lie below the tree's height. In the comparative it is the maximum degree of tallness for two individuals that is compared. More technically, (19) should be replaced by (22):

(21) a. John is taller than Mary.

(22) b. $\exists h_j \exists h_m.\ h_j = \text{UpLim}(\{d: \text{tall}(j, d)\}) \wedge h_m = \text{UpLim}(\{d: \text{tall}(m, d)\}) \wedge (h_j > h_m)$

This, however, does not alter the essential truth that comparatives predicate on Intervals or gaps. Putting together (19), (20) and (22), we get (23), with (23b, c) expressing the fact that in comparatives the MP measures out a *differential interval*:

(23) a. John is [2 inches] taller than Mary
b. 2 inches ([height'(m), height'(j)]
c. the size of the Interval from John's height to Mary's height is 2 inches

Unlike the comparative and the *too/prea* construction, *the positive degree does not make reference to intervals (or gaps)*. Gradable adjectives are functions that map individuals onto degrees (rather than sets of degrees). For example, the adjective *înalt/tall* is a two place predicate *tall*'(x, d) relating individuals to their height. Used in the positive degree, *înalt/tall*

actually means exceeding a certain contextually established value *d-tall*, supplied by the context (the standard value for tallness in a context, cf. Kennedy 2001).

(24) a. tall (x, d) "x's height exceeds d".
b. Ion şi Petru sunt înalți.
'Ion and Petru are tall.'

Thus (24b) is true if both Ion and Petru exceed a certain contextually given degree of tallness, but sentence (24b) does not require that Ion and Petru should have the same height.

3.3 Towards an explanation of the difference between the positive and the comparative regarding their ability to occur with MPs

The MP predicates about *a set of degrees*, therefore *an interval* on the respective scale.The semantics of the positive involves *degrees*, rather than sets of degrees. This is the reason why adjectives do not normally allow direct modification by MPs. One can understand why (25) and (27) are ruled out:

(25) *Maria este înaltă de înălțimea lui Ion.
'Mary is John's height tall.'
(26) Maria este înaltă de 1,75m.
$\exists$d [tall (m, d) $\wedge$ 1,75m' (d)]
(27) a. *Maria este grasă de 50 de kilograme.
$\exists$d [heavy (m, d) $\wedge$ 50 kilograme' (d)]

John's height/înălțimea lui Ion in (25) are *proper names of degrees*, not degree-predicates. *A degree predicate* (always) *denotes a set of degrees* (i.e. an interval). A MP is a predicate of **a set of degrees**. In the case of the comparative this set is just the gap between the two degrees quantified over by the comparative. In (27) the MP should predicate of a *single degree*, not a gap. It is correctly predicted that (27), as well as all of the examples (14b – 17b, 18c) are bad. It is not clear, however why certain adjectives, such as (26), do allow direct measure phrase modifiers.

To account for this difference, Schwarzschild (2005) assumes that for *înalt /tall,* and suchlike adjectives, there is a lexical *type shifting rule* that produces homonyms; these homonyms have *interval arguments* (sets of degrees) in place of degree arguments, and they are compatible with MPs. Such a rule is given in (28):

(28) *Homonym Rule: from degrees to intervals*
If A has meaning A' that relates individuals to degree, then A has a secondary meaning relating *individuals to sets of degrees* (intervals), the secondary meaning is given by: λI.λx. I = {d : A' (x, d)}.
A$\rightarrow$ *înalt* 'tall'*, adânc* 'deep'*, greu,* 'heavy'*, lat,* 'wide' *gros* 'thick'*, lung,*'long' and a few others.

Following the translation scheme used so far, we translate *înalt/tall* on its primary meaning as **înalt$_1$** and on its secondary meaning as **înalt$_2$**. According to the rule in (28), **înalt$_2$** relates an individual x to an interval and that interval is just *the set of all points on the scale that* **înalt$_1$** *relates x to*. The rule in effect collects all the degrees related to an individual in a way reminiscent of how the definite article collects together all the individuals in the extension of

boy to give the meaning of **boys**. Given the interpretation of **înalt** $_2$, sentence (26) may be represented as in (29):

(29) a. Maria este înaltă de 1,75m.
'Maria is 1.75 m tall.'
b. $\exists$I [tall (m, I) $\wedge$ 1,75m (I)]

We retain that a MP always denotes a predicate of scalar *intervals*.

Conclusions so far: 1) MPs are predicates denoting sets of degrees, their arguments (subjects) should be *intervals*, not simple degrees. 2) The comparative always makes reference to an interval, the gap between the two degrees of the same property on a scale. Hence the comparative is always compatible with MPs. 3) Since the positive is about simple (maximum) *degrees*, not intervals, adjectives in the positive do not accept direct measure phrase modification. 4) A limited group of adjectives have secondary meanings referring to intervals (sets of degrees), rather than mere degrees. These are the few adjectives which accept direct MP modifiers.

4. Monotonic dimensions and partitivity

4.1 Partitive and attributive MPs inside NPs

It is important to note that not all nominals that have MP structure, being composed of a *cardinal + unit noun*, receive the same interpretation. A first category, discussed so far, characterize *monotonic dimensions* of objects or events, i.e., dimensions dependent on the part-whole structure of the entities considered. Let us refer to these as *partitive MPs*. A second category of MPs size up certain *qualitative* dimensional standards of the substance and do not single out any monotonic dimension. Let us call these *attributive MPs*. The contrast between them is apparent in the following examples:

(30) Partitive MPs
a. câteva grame de aur
'a few grams of gold'
b. un centimetru de frânghie
'a centimeter of rope'
c. 6 kilograme de cireşe
'6 pounds of cherries'

(31) Attributive MPs
a. aur de 18 carate
'18 karate gold'
b. cablu de 2 milimetri
'2 millimeters' cable'

The characteristic property of the partitive is that it is *monotonic* on a dimension of the substance denoted by the noun. In the attributive construction the MP denotes and measures a non-monotonic property of the substance noun. The two constructions are rarely interchangeable, but the few cases there are illuminate the different interpretations of the two constructions:

(32) a. Ion a folosit *cablu de 2 mm* ca să-şi instaleze calculatorul. (diameter)
'Ion used 2 inch cable to set up his computer.'
b. Ion a folosit *2 cm de cablu* ca să-şi instaleze calculatorul. (length)
'Ion used 2 inches of cable to set up his computer.'

Thus, *cablu de 2 mm* in (32a) picks up the diameter of the cable as the relevant dimension. The diameter does not vary with the size of the cable, being a non-monotonic dimension, while *2 cm de cablu* picks up length as the relevant dimension in (32b). Length varies with the part-whole structure of the cable, it is thus a monotonic property. When one ordering tracks another ordering, it is said to be monotonic on those part whole relations. On the strength of such examples, Schwarzschild (2006) states the following interpretive principles:

a. When a MP is combined with a substance noun in a *partitive construction*, the interpretation is one in which the dimension is monotonic on the relevant part-whole relation in the domain given by the noun.

b. When a MP is combined with a substance noun in the *attributive construction*, the interpretation is one in which the dimension is non-monotonic on the relevant part-whole relation in the domain given by the noun.

Thus, given that temperature is not monotonic on the part-whole structure of water, we get *apă de 20 de grade*, '20 degree water', and not **20 de grade de apă* , '20 degree of water'. In contrast, the MP in an expression like *două ore de plimbare*, '2 hours of walking' characterizes duration, a montonic property of events of walking.

4.2 Some syntactic correlates of the semantic difference between partitive MP an attributive MPs

What is particularly striking is that the contrast between the two types of MP-interpretation is reflected in syntax. In Romanian the two constructions exhibit different word orders: With partitive MPs the order is *MP+ de + substance noun* (see 30); with attributive MPs it is the opposite: *substance noun + de + MP* (see 31).

A family of partitive structures. The separation of the two semantic roles of MPs allows one to better understand their formal properties. It is immediately apparent that the measure phrase partitive, of type, *2cm de cablu,* is in the same *family of nominal monotonic constructions* which includes proper partitives and pseudo-partitives. The measure-phrase partitive is a particular form of the pseudopartitive (see Corver 1998, Stavrou 2003). Importantly, these constructions share the same formal structure, with the *MP preceding the substance noun*, for proper partitives, pseudo-partitves, and measure phrase (pseudo)-partitives. Also all of these constructions are *prepositional*, containing the (once) partitve preposition *de* (cf. Cornilescu 2006). An adequate syntactic analysis should capture these formal similarities, possibly in terms of a common functional projection, such as the Monotonicity Phrase in (4) (see section 5 below).

(33) Partitives proper
a. 100 de grame *din*(de +în) ceaiul acela
100 of grams from(of +in) tea.the that
'100 grams of that tea'
b. o parte *dintre* (de+ între) bananele cumpărate ieri
one part from bananas.the bought yesterday

Pseudopartitives

(34) a. o ceaşcă *de* ceai
a cup of tea
b. o mână *de* cireşe
a handful of cherries

Measure-phrase pseudopartitives

(35) a. doi metri *de* catifea
two meters of velvet

b. un kilogram *de* cireşe
a kilo of cherries

Cardinal numerals

(36) a. adjectival
doi băieți / două fete
two.M boy.M.Pl/ two.F girl.F.Pl.
b. nominal
două sute *de* cărți
two hundred.Pl of book.Pl

In most languages the marking of partitives and pseudo-partitives is different, with pseudo-partitives often requiring or at least allowing juxtaposition. Thus, in certain Romanian functional styles too (e.g. cooking recipes, technical Romanian), juxtaposition, when used allows a pseudopartitve (monotonic) interpretation:

(37) Ingrediente: 50 grame şuncă, 100 grame făină
ingredients: 50 grams ham, 100 grams flour

Finally, notice that Romanian also corroborates one of the typological remarks made in Koptjevskaja-Tamm (2001), which is that the forms which partitives and pseudopartitives assume are the forms of *numeral constructions*. Indeed Romanian possesses alongside of adjectival cardinal numerals, nominal cardinals (see 36). Pseudo-partitive and partitives extend the formal structure of nominal cardinal numerals. Koptjevskaja-Tamm (2001) argues that, apparently, partitives and pseudopartitives come about when MPs are combined with nouns or noun phrases to form a construction with a *monotonic* interpretation.

Countability and partitivity. The count-mass distinction is highly relevant in the distribution of the two constructions. As often remarked, (see for instance Borer 2005), singular count nouns are individuated and have no proper subparts, therefore no monotonic dimensions. Expectedly, singular count nouns disprefer the partitive construction. In exchange count nouns are hospitable to all types of MPs in the attributive construction, with the MP referring to fixed dimensional attributes. Measure phrase partitives are felicitous with mass nouns and countable plurals. Compare count/mass nouns in the sets of examples below;

(38) a. găleată de doi litri *apă de doi litri
bucket of two liters water of two liters
*doi litri de găleată doi litri de apă
two liters of bucket two liters of water

b.	o picătură de 2 mililitri a drop of 2 milliliters 'a 2 milliliter drop' *2 mililitri de picătură 2 milliliters of drop	*sânge de 2 mililitri blood of two milliters '2 milliter blood' 2 mililitri de sânge 2 milliliters of blood	**volume**
c.	un poem de două pagini 'a two page poem'	*o lirică de două pagini *a two page poetry'	**page count**

Importantly, quite a few nouns occur in both constructions, either because they are uncountable and the object denoted has both monotonic and non-monotonic dimensions (e.g. *cablu* 'cable', *catifea* 'velvet'), or because the noun has dual countable/ uncountable employment (e.g. *poezie* 'poetry' 'poem', *sticlă* 'glass', 'bottle'). Sometimes, both constructions show up in the same phrase, as in (39c):

(39) a. *un metru de catifea* (monotonic dimension: length)
one meter of velvet
b. *catifea de 1, 40* (non-monotonic dimension: width)
velvet of 1.40
'1.40 m velvet'
c. *un metru de catifea de 1,40*
'one meter of 1.40 velvet'

(40) a. *două pagini de poezie* (uncount)
two pages of poetry
b. *o poezie de trei strofe* (count)
a poem of three stanzas

In the preceding section we established that MPs are interval predicates. It appears that the internal variable of uncountable nouns may be conceptualized as an interval. This is the role of the classifier (unit noun), without which the MP construction would be impossible. The fixed dimensions in the attributive construction are also intervals, hence the compatibility with attributive MPs.

Conclusions 1. There are two types of interpretations associated with MP, monotonic interpretations, characteristic of Partitive MPs and non-monotonic interpretations, characteristic of Attributive MPs. 2. The measure phrase partitive is a subtype of the pseudo-partitive construction. 3. A consideration of the family of monotonic constructions shows important formal similarities between the proper partitive, the pseudo-partitive and the measure-phrase partitive, stemming from the fact that they all develop formal elements available in the structure of the prototypical monotonic construction, the scale of the cardinal numerals.

4.3 Montonicity and adjectives

The contrast between partitive use and attributive use is also found with adjectives, *when they function as noun modifiers*. According as they track monotonic or non-monotonic properties of substances/objects, dimensional adjectives may be *monotonic* or *non-monotonic*.

Ordinary dimensional adjectives are *non-monotonic*. They felicitously combine with *countable nouns*, (which have fixed non-monotonic dimensions), in attributive constructions. If reference is made to a monotonic dimension of a mass noun, an ordinary dimensional adjectives, which has an attributive (non- monotonic) reading, is infelicitous, as apparent below:

(41)	a.	serviciu rapid	(duration)	*muncă rapidă
		job quick		work quick
	b.	picătură mare	(volume)	*sânge mare
		drop big		blood big
	c.	poem lung	(line count)	*lirică lungă
		poem long		poetry long

The list in (41) shows examples of count/mass pairs. In each case, a dimension expressed by the adjectives, given in the center column, is possible with the count noun, which has no part-whole dimension and allows the attributive reading, but not with the corresponding mass noun. Thus *lung* 'long' is a non-monotonic adjective in (41c), in line with the fact that *poem* is a count singular noun. The uncountable nouns, like *lirică* 'poetry', in the right hand column simply lack the relevant dimension and cannot combine with the attributive dimensional adjectives.

In conclusion, when a dimensional adjective is combined with a substance noun in the attributive, the interpretation is one in which the dimensions expressed by the adjectives is non-monotonic on the relevant part- whole relation in the domain given by the noun. Dimensional adjectives are *greu* 'heavy', *rece* 'cold', *scump* 'expensive', *înalt* 'tall', *mare* 'large', etc.

On the other hand, both Romanian and English possess a well-defined and widely discussed group of *monotonic adjectives*. This is the group of *quantifying adjectives* Q_APs in (42). They are perfect examples of monotonic adjectives. The monotonic dimensions they track are the *cardinality* of sets (countable plural nouns) or the *amount* of substance (mass nouns). Much evidence (some of it reviewed below) shows that these quantifiers are adjectives. A first adjectival property is their agreement morphology:

(42) Q-adjectives: mult (M.Sg)/multă (F.Pl), 'much', mulți (MPl)/multe (F.Pl), 'many', puțin (M.Sg) puțină (F.Sg), 'little', and puțini (MPl)/puține (F.Pl), 'few'.

In Romanian, their adjectival behavior is also apparent in the alternative post-nominal position, a position open to adjectives, but not to determiners or quantifiers (41a, b). At the same time, these adjective, precisely because of their monotonic, cardinal-like interpretation may get very high in the DP, occupying the QP position below D, or even the DP position (43c). Therefore, quantifying adjectives have developed functional uses.

(43)	a.	contraexemple puține
		counterexamples few
	b.	acele puține contraexemple
		those few counterexamples
	c.	puținele contraexemple cunoscute
		few.the counterexamples known

The quantifying adjectives are scalar. This is confirmed by their having comparative degrees, as well as by their ability to combine with degree words like *too/prea*, *aşa/so*, *foarte/very*, etc.:

(44)	mult/puțin	mai mult/puțin	cel mai mult/puțin
	much/little	more much/little	the more much/little
	'much'/ 'little'	'more'/ 'less'	'the most'/ 'the least'

(45) foarte/ prea/aşa multă/puţină apă
very/ too/ so much/little water

Interestingly, quantifying adjectives are also distinguished through their position in true partitives: namely, unlike other adjectives, they *precede* the partitive prepositions *din*, *dintre* (out of) functioning as weak indefinite pronouns, as in (46). They also appear in pseudo-partitive construction with the same monotonic interpretation (see 47).

(46) prea mult/puţin din laptele băut
'too much/little of the milk drunk'
(47) prea mult/puţin lapte
too much/little milk

Thus, Q_AP represent a group of *functional monotonic adjectives*. When a Q_AP is combined with a substance noun, the interpretation is one in which the dimension is monotonic on the relevant part-whole relation in the domain given by the noun. Monotonic dimensions other than cardinality and amount may also be referred to:

(48) a. aşa puţină căldură/gălăgie energy
'so little heat/noise'
c. mai puţină bogăţie economic value
'less wealth'
d. mai multă informaţie/ ştiinţă informativeness
'more information/knowledge'

Putting the results on monotonic and non-monotonic adjectives together, we can make the same difference as with measure phrase between attributive and partitive readings, as in *too much paper* (weight, monotonic) and *heavy paper* (weight per unit, non-monotonic interpretation), or in *multă apă* (much water) and *apă grea* (heavy water, a different substance).

Conclusions. 1. There are monotonic and non-monotonic adjectives. Ordinary dimensional adjectives appear in attributive constructions and give rise to non-monotonic *qualitative* interpretations. Syntactically they are low in the structure. 2. Quantifying adjectives are *monotonic* on the cardinality of sets (many students) or the amount of substance. In both languages quantifying adjectives appear higher in the structure, first because they have determiner uses. Secondly they precede the partitive preposition in the proper partitive construction: *many of the students/multi dintre studenti*.

In the next section we detail the syntactic structure of NP/DPs and APs containing measure phrases in both monotonic and attributive interpretation.

5. Measure phrases in Romanian noun phrases

5.1 Aim of the section

We start the analysis with MPs inside noun phrases, since nouns differentiate between the partitive and the attributive MPs and this gives a good clue regarding the internal structure of the phrase. While the basic syntactic configuration underlying partitive constructions has been extensively discussed above, nothing definite has been proposed regarding the syntax of the attributive construction. A syntactic account of the attributive construction is also offered in this section.

An important result that has come out is that the privileges of occurrence with a MP are not the same for different categories of nouns. We have so far stressed on the following as relevant nominal properties: a) possession of monotonic vs. non-monotonic dimensions; b) the relevance of countability. A third relevant sub-classification, we propose, opposes nouns which denote dimensions (*length*, *breadth*, etc.) to nouns which merely have monotonic properties (*trees*, *rivers*, etc.). The syntax of dimensional nouns is very different when occurrence with MPs is considered. It is also important to stress that, even if prototypically MPs are NPs, other syntactic categories, *in particular PPs*, (as also stressed in Corver 2006) may also fill the Measure role.

We also examine word order variation (position of the MP with respect to the head), the possibility of splitting the construction, and of questioning the MP. As usual, a cross-linguistic perspective will be helpful in understanding the complexities of measure phrase constructions (an excellent survey of which is available in Corver 2006).

5.2 The partitive MP construction: the basic configuration

The discussion in section 4 above has shown that both measure phrases (MPs) and quantifying adjectives (Q_APs) give rise to monotonic constructions headed by adjectives, nouns, and occasionally prepositions:

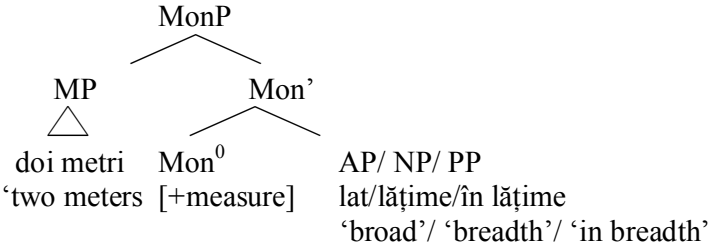
(49) a. [puțin]$_{QP}$ interesant
little interesting
b. [2m]$_{MP}$ de adânc
2m of deep

(50) a. puțină apă
little water
b. 2m adâncime
2m depth

(51) a. foarte mult la stânga
very much to left
b. 2cm la stânga
2cm to left

To capture the shared interpretation and the formal similarities of monotonic constructions, Schwartzschild proposes that they share a functional projection, the Monotonicity Phrase; MonP is headed by Mon^0, a syntactic a *functional head that assigns a sort of measure θ-role to a measure phrase (MP) or to a Q_AP.* This functional head is part of the extended projection of any of the lexical categories occurring in monotonic constructions.

(52)



Following Grimshaw (2005: chapter 1), Schwarzschild takes this head to have a higher F-value than D^0 which means that when they both occur in a single projection Mon^0

must be above D^0, but the presence of Mon^0 does not entail the presence of D. This set up allows Schwartschild (2006) to propose the analyses in (53) below for Italian proper partitive and pseudo-partitive constructions, and the analyses in (54) for the English pseudo-partitive:

(53) a. [$_{MonP}$ [$_{QP}$ molti] [$_{Mon'}$ [$_{Mon}$] [$_{DP}$ ne]]
[$_{MonP}$ [$_{QP}$ many] [$_{Mon'}$ [$_{Mon}$] [$_{DP}$ (of) them]]
b. [$_{MonP}$ [$_{QP}$ molti] [$_{Mon'}$ [$_{Mon}$] [NP ragazzi]]
(54) a. [$_{MonP}$ [$_{NP}$ one ounce] [$_{Mon'}$ [$_{Mon}$ of] [NP salt]]
b. [$_{MonP}$ [$_{AP}$ much] [$_{Mon'}$ [$_{Mon}$] [NP salt]]

As apparent above, the Mon head is higher than D in the proper partitive construction (53a). Schwartschild's analysis is thus a variant of the mono-projectional analysis of the partitive construction (see Zamparelli 1998, Kupferman, 1999, Grimshaw, 2005, and Giurgea and Nedelcu 2008 for Romanian), an analysis claiming that there is only one occurrence of the lexical head, which spawns the more elaborate functional structure, characteristic of the proper partitive. The earlier alternative traditional analysis (Selkirk 1977 and Jackendoff 1977) was bi-projectional, insisting on the fact that the presence of two determiners (***many*** *of* ***the*** *students*) was indicative of the existence of two distinct. What matters for current purposes is that in the mono-projectional approach to partitives the preposition *de/of* can be assigned a significant operator role (cf. Zamparelli 1998, Giurgea 2008). The preposition also has a significant operator role in the Mon P interpretation of the partitive. While this is not the place to evaluate the merits of this proposal for the proper partitive construction (see Giurgea and Nedelcu 2008), the Monotonicity Phrase approach has proved to be a valuable solution in the analysis of comparatives (see Cornilescu 2007b for Romanian), and will also, hopefully, prove to be a plausible solution for Measure Phrase partitives. As apparent in (50), the MP or alternatively a Q_AP *merge as a specifiers of the MonP*.

As to the semantic bond that holds between the substance NP and the MP or Q_AP, an answer was first suggested by Abney (1987: 294), and later by Löbel (2001). They propose that a noun (and presumably other lexical heads, in particular adjectives) can assign a non-referential (cf. Rizzi 1990) Measure θ- role. The Measure θ-role specifies the connection between the substance being quantified over (denoted by the lexical head) and the measure-phrase meaning. MonPs quantify over entities which denote dimensions as a starting point, constraining the choice of a monotonic dimension from the conceptual structure of the lexical head. We assume that the Mon head is the source for the Measure role. The role is indifferent to whether the specifier is occupied by a Q_AP or MP, so long as it has the right kind of semantics.

Translating this semantic description into minimalist syntactic terms, we shall say that the Mon head extends a lexical phrase in whose conceptual make-up there is a monotonic dimension. The Mon head contains an un-interpretable [+measure] feature which may be checked off by external merge of a QP or MP (as in 4), both of which are interpreted as predicates of scalar intervals. Mediating a relation between a subject (the interval variable) and a predicate (the MP) or Q_AP), Mon is a copula in a very general sense, this analysis being somewhat similar to Corver's predicational analysis.

5.3 The syntax of the Romanian measure-phrase partitive inside nominal phrases

The measure-phrase partitive appears with *mass nouns* and *plurals.* As already explained, these are precisely the nouns that occur in the regular pseudo-partitive construction, *MP+of + NP* (see 55a,b, 56a). Expectedly, these nouns do not occur in the

attributive construction, typical of countable nouns, that is, the substance noun cannot precede the MP (see 55c, d, 56b).

In this analysis the preposition *de* 'of' is an obligatory realization of the Mon^0 head, related or identical with the Romance partitive preposition *de*, and to the preposition inside cardinal numerals. A similar analysis has been proposed for pseudo-partitive constructions in Dogaru (2007). (For a very different well-known proposal see Corver 2006 and earlier papers).

(55) a. trei metri de pânză
three metes of linen
b. doi metri de catifea
two meters of velvet
c. * pânză de trei metri
linen of three meters
d. *catifea de doi metri
velvet of two meters

(56) a. trei kilograme de cartofi
Three kilos of potatoes
b. *cartofi de trei kilograme
potatoes of three kilos

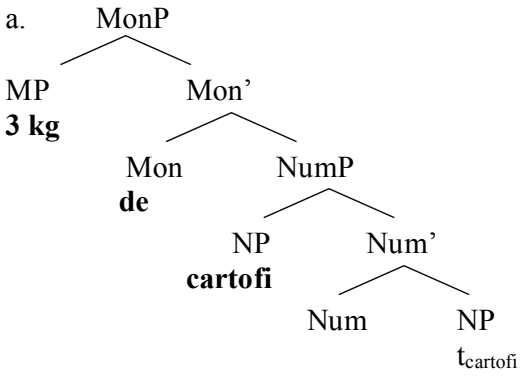
In the MP pseudo-partitive, agreement on the verb may be either singular or plural, with a definite preference for the plural as seen in (57) below (for examples of dual agreement in pseudo-partitive constructions, see *Gramatica Academiei*, *Enunțul* 2005, vol. II, 354-358; for a discussion of agreement in pseudo-partitive and qualitative constructions see Hulk and Tellier 2000, Doetjes and Rooryck 2003).

(57) a. (?) Cinci kilograme de vin nu e suficient pentru toți musafirii.
five kilos of wine not be.3dP.Sg sufficient for all guests.the.
'Five kilos of wine is not enough for all the guests.'
b. Cinci kilograme de vin ajung precis pentru toți musafirii.
five kilos of wine suffice.3dP.Pl surely for all the guests
'Five kilos of wine is not enough for all the guests.'
c. Cele cinci kilograme de vin nu ajung/*ajunge pentru toți musafirii
the five kilos of wine suffice.3dP.Pl/*suffice.3dP.Sg for all the guests.

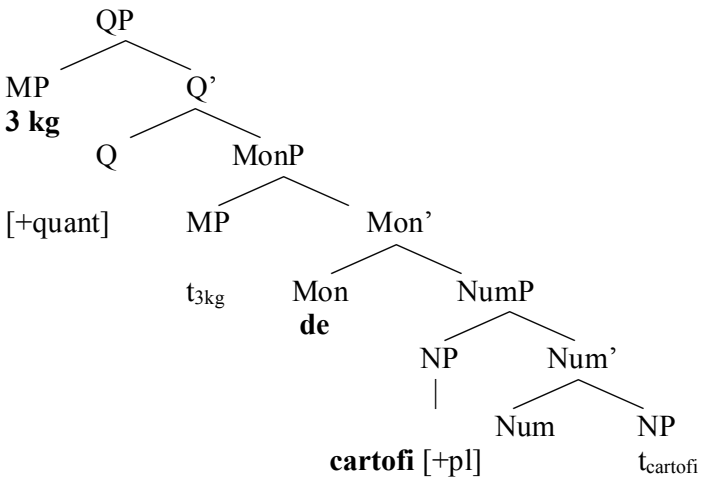
Since Romanian nominal phrases are at least NumPs (cf. Dogaru 2007) and NPs always check Number, it follows that the complement of Mon^0 is a Num P rather than simply a NP. The measure phrase, at least when it imposes semantic plural agreement, functions as a determiner phrase. Technically, we will assume that it checks a [+quantity] feature in Quant P, so that the functional structure of the phrase is QP> MonP > NumP > NP (cf. also Borer 2005, Alexiadou, Haegeman and Stavrou 2007). Plural agreement is secured by the semantic quantity feature, while if the feature of the head NP percolates, agreement will be in the singular for uncountable nouns, like *vin /wine* in the example above. If a strong definite determiner also merges, agreement is only in the plural.

As an example, consider the measure phrase partitive in (56a). It starts outs as in (58a), and next the quantity feature is checked by the MP.

(58) a.



b.



The Measure (quantitative) role assigned by Mon is confirmed by the fact that when the MP is questioned the appropriate question phrase is *quantitative*, based on *câți* 'how many'+ *unit noun*. The interrogative MP may be fronted alone, or it may pied-pipe the whole nominal phrase (QP).

(59) a. *Câți metri* ai cumpărat *de catifea*?
how many meters have bought of velvet
'How many meters of velvet did you buy?'
b. *Câți metri de catifea* ai cumpărat ?
c. *Câte kilograme* ai cumpărat *de cartofi*?
how many kilos have bought of potatoes
'How many kilos of potatoes did you buy?'
d. *Câte kilograme de cartofi* ai cumpărat?

The possibility of questioning the MP alone is evidence that the MP may move to an A' –position (DP-Periphery) from where it targets the CP-periphery. Further evidence of movement to an A-bar positions is the existence of split DP constructions. Either the substance noun or the remnant PP of the MonP can be fronted, even if fronting the PP yields a somewhat degraded result, as shown by (59b, d) and (60b).

(60) a. Am cumpărat *numai doi metri de catifea*.
have bought only only two meters of velvet.
'I bought only two meters of velvet.'

b. *Numai **doi** metri* am cumpărat *de catifea*.
only two meters have bought of velvet.
'Only two meters did I buy of velvet.

c. Am cumpărat *doi metri numai de catifea* (pe lângă *trei metri de mătase*).
have bought two meters only of velvet (besides three meters of silk)
'I bought two meters of silk alone, in addition to three meters of silk.'

d. ??*Numai de **catifea*** am cumpărat *doi metri,* (*de mătase* am luat *trei metri*)
only of velvet have bought two meters (of silk have bought three meters)

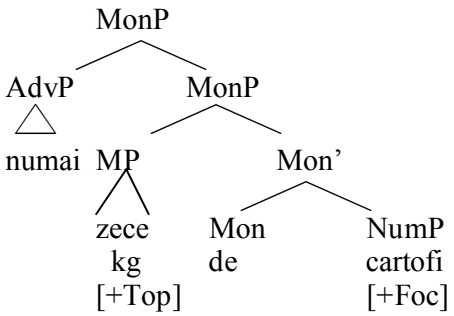
(61) a. Am cumpărat *zece kilograme numai de cartofi*.
'I bought three kilos of potatoes.'

b. *Zece kilograme* am cumpărat *numai de cartofi*.
ten kilos have bought of potatoes

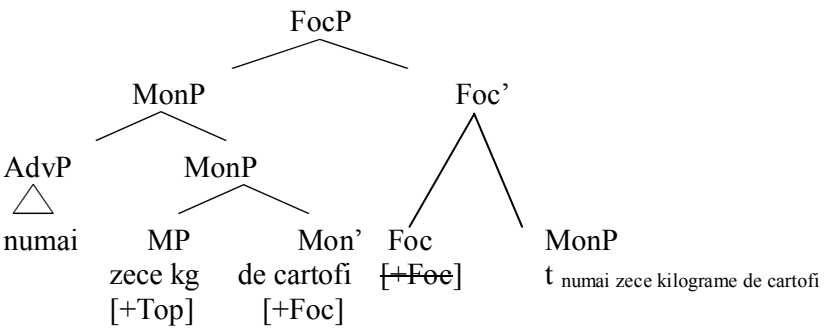
Consider the split DP constructions in (61b) now. In split DP constructions, the constituent which is fronted escapes the DP through the DP operator position, presumably, Spec DP. As shown by McNay (2005, 2006), in a split DP construction both the fronted and the remnant constituent are likely to be prosodically marked, which shows that both of them check features at the periphery of the DP, before one of them escapes through the Spec DP hatch. Following many researchers (Giusti 1996, 2002, Aboh 2004, Ihsane and Puskas 2001, Cornilescu 2007a), we assume that the periphery of the DP includes a FocP and a TopP below D. Consider the example in (62), where the two halves of the measure pseudo-partitive might be interpreted as contrastive topic and contrastive focus, respectively. Assume that the two constituents bear the two P-features at Merge, as shown in (62a). The steps of the derivation follow the order of merge. The Foc head merges and attracts to its Spec the MonP, which contains the contrastive focus particle *numai*, 'only', scoping on the substance noun [*cartofi*]$_{NumP}$.

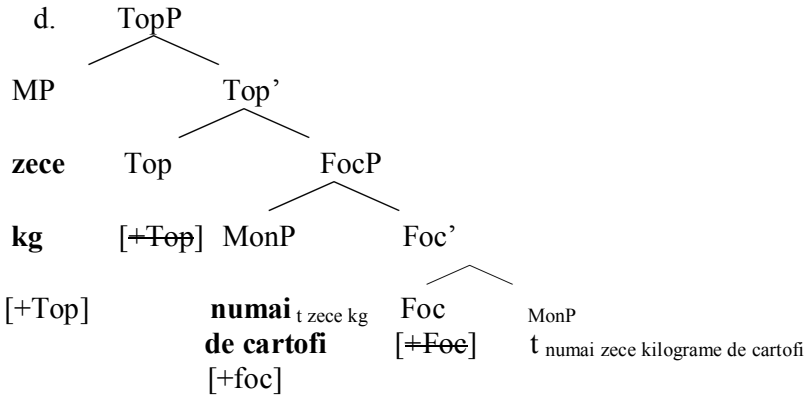
(62) a. [ZECE kilograme]$_{CT}$ am cumpărat [numai de CARTOFI]$_{CF}$

b.



c.





At the following step the Topic head merges. The MP, [*zece kilograme*]$_{NP}$ which has incorporated a [Top] feature is attracted to Spec,TopP (as shown in 62d, and hence presumably to the operator, escape hatch position, Spec, DP. The two halves of the split MonP have prosodic marking, respectively occupying a contrastive topic position in the C domain and a contrastive focus position in the D domain.

The derivation of the questions in (59) will follow the same model.

5.4 The attributive MP construction

MPs also occur the attributive construction, which is less selective appearing with any nouns (countable or uncountable), provided that their conceptual make up includes a fixed non-monotonic property characterized by the MP. Also, the attributive construction is possible for dimensional nouns like those in (63) (since they may be countable) and for ordinary non-dimensional nouns (64).

(63) a. Are o înălțime de doi metri.
(it) has a height of two meters

b. Are o lățime/grosime de 60 de centimetri.
(it) has a breadth/thickness 60 centimeters

c. Are o adâncime de 20 de centimetri.
(it) has a depth 20 centimeters

d. Am propus diametrul de 2 centimetri.
have proposed diameter.the of 2 centimeters

(64) a. Era un ger de minus douăzeci de grade.
was a frost of minus twenty of degrees
'It was a twenty-degree-below-zero frost.'

b. Procedura cere o temperatură de 20 de grade.
procedure.the requires a temperature of twenty of degrees
'The procedure requires a twenty degree temperature.'

c. Zgomotul are o intensitate de patruzeci de decibeli.
noise.the has an intensity of forty of decibels

d. Ion are o avere de trei milioane.
Ion has a fortune of three millions

e. Au săpat un şanț de trei metri.
have dug a ditch of three meters
'They dug a three meters' ditch.'

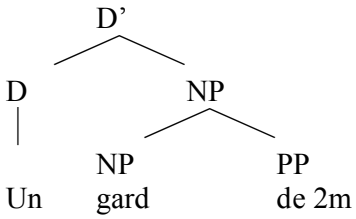
f. N-am sărit gardul de doi metri.
not-have jumped fence.the of two meters
g. Imi trebuie o sacoşă de zece kilograme.
to.-me-needs a bag of ten kilos
'I need a ten kilos'bag.'

Several properties of the attributive structure are easy to notice. The first is the regular presence of *a determiner, agreeing with the lexical head*, unlike the preceding case. This suggests that the MP is an ordinary adjunct and is not part of the functional structure of the DP. The *qualitative* interpretation of the MP in this construction is also apparent in the type of question which should be asked to get the MP as an answer. The relevant question is *ce* 'what' + *unit noun*, for nouns conceptualized as denoting a particular degree of a scale, or even *ce fel de* 'what kind of + *noun*':

(65) a. Ce înălțime are camera ?
what height has room.the
b. Ce fel de gard era?
what kind of fence was

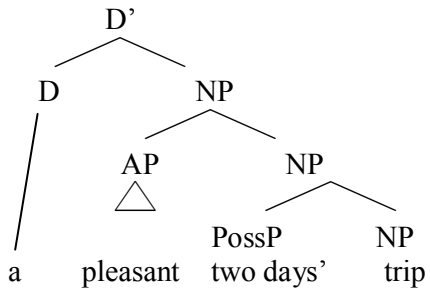
We propose that, from a syntactic perspective, *attributive MPs are regular prepositional adjuncts*, occupying the same position as adjectives and other prepositional modifiers in the DP. The syntactic category of the measure phrase, the preposition *de* is a case-assigner, part of the MP.

(66)



This is confirmed by the English attributive MP, often expressed as a *low attributive measure genitive*. The English measure genitive is low in the structure: it may occur below adjectives and below the argumental (determiner) genitive, as shown below.

(65)



Furthermore the adjunct status of measure NP is confirmed by the fact that in English it may be treated as an invariable left-hand member of a "compound" (cf. Corver 2006, Kayne 2003). The MP has no plural morphology in this case.

(68) I like Bill three-mile (*s) driveway (from Corver 2006:17)
18 karate gold (from Schwartschild 2006)

Given that the preposition *de* is still available in Romanian both as a qualitative genitive preposition (Cornilescu 2003, Mardale 2007) and as a partitive preposition (Cornilescu 2006), the most natural interpretation of the attributive measure phrase is that of a measure genitive too.

5.5 The syntax of dimensional nouns. The non-prepositional construction

A fact that has so far gone unexplained is that some of the nouns that appear in the attributive construction namely, *those that denote dimensions themselves* may appear in a specialized MP-construction, with the MP *directly* preceding the head: *MP+ dimensional noun* (or, less frequently, following the noun) *dimensional noun + MP*. This section is devoted to a discussion of these two non-prepositional constructions. Inherently dimensional nouns are illustrated by *lungime* 'length', *înălțime* 'height', *grosime* 'thickness', *intensitate* 'intensity', diametru '*diameter*', etc.

(69) a. Copacul are *doi metri înălțime*.
tree.the has two meters height
a'. Copacul are *înălțime doi metri*.
tree.the has height two meters
b. Are *trei centimetri lățime* / *grosime*.
(it) has three centimeters breadth/ thickness.
b'. Are *grosime/ lățime trei centimetri*.
(it) has breadth/ thickness three centimeters.
c. Are *20 de centimetri adâncime*.
(it) has 20 of centimeters depth
c'. Are *o adâncime de 20 de centimetri.*
(it) has a depth of 20 of centimeters
d. Are *zece metri diametru*.
(it) has ten meters diameter

The first construction *MP+ dimensional noun* is discussed first. There are several properties of this construction which should be mentioned. First, nouns which are not dimensional, and cannot be so conceptualized do not occur in this construction, but only in the attributive one. Compare:

(70) a. *Era trei metri şanț.
(it) was three meters ditch
a' Era un şanț de trei metri.
(it) was a ditch of three meters
b. *?Era(u) minus zece grade ger.
(it) was minus ten degrees frost
b' Era un ger de minus zece grade.
(it) was a frost pf minus ten degrees frost
c. *Imi trebuie 10 kilograme sacoşă.
to-me needs 10 kilos bag
c'. Îmi trebuie o sacoşă de 10 kilograme.

to-me needs a bag of ten kilos
d. *Îmi trebuie doi litri sticlă.
to-me needs two liters bottle
d' Îmi trebuie o sticlă de doi litri.
to-me needs a bottle of two liters

Incidentally, notice that dimensional nouns have peculiar properties in other languages as well. Thus in English attributive MPs often appear in the synthetic 's Genitive, while the *of*-construction is available only to dimensional nouns.

(71) a temperature of twenty degrees
a breadth of two centimeter.
(72) *a ditch of two meters
*a tree of two meters

Let us return to the Romanian *MP + dimensional noun* construction. Since this is a nominal dimensional construction, it should be either partitive or attributive. Apparently its formal properties align it with the *partitive construction*. This structure actually completes the paradigm of dimensional nouns, which do indeed denote monotonic dimensions, but do not appear in the regular, prepositional partitive structure.

(73) a Copacul are o înălțime de doi metri. (attributive)
tree.the has a height of two meters
b. Copacul are doi metri înălțime (non-prepositional partitive).
tree.the has two meters height
c. *Copacul are doi metri de înălțime (prepositional partitive).
tree.the has two meters of height
(74) a. o lungime de doi metri (attributive)
a length of two meters
b. doi metri lungime (non-prepositional partitive).
two meters length
c. * doi metri de lungime (prepositional partitive).
two meters of length

We argue that this is a variant of the *partitive monotonic construction*, for the following reasons: a) The order of the constituents is as with the measure partitive, i.e. MP+ dimensional noun. b) Secondly, in the *MP+ dimensional noun* order, the noun is treated as *uncountable* and consequently occurs without a determiner. In particular, the indefinite article or any determiner that agrees with the head noun is excluded. Agreement is again dual, as with the partitive construction.

(75) a. Doi metri lungime este suficient.
two meters length be3dP.Sg sufficient
b. Doi metri lungime ajung.
two meters length suffice.3dP.Pl

c) When there is a determiner it agrees with the MP and determines plural agreement on the verb, as in (76a, b). On the other hand, if an (in)definite article occurs on the head noun, so does the preposition *de*, in the attributive construction (76c):

(76) a. Cei doi metri înălțime pe care îi are nu-l ajută în viață.
the.Pl two meter.Pl height which then=has not-him help in life
'The two meters of height he has don't help him in life'.
b. Aceşti doi centimetri grosime trebuie salvați.
these two centimeters thickness need saving.
c. ?Înălțimea de doi metri pe care o are nu-l ajută în viață.
'The two meters' height he has doesn't help him in life'

There are also two properties of the construction which it does not share with the measure phrase partitive. The first is the absence of the preposition *de*, illustrated in (71) and (72) above. Dimensional nouns apparently do not occur in the measure-phrase partitive construction:

Secondly, alongside of the order *MP+ dimensional noun*, there is also the order dimensional noun + MP in (75b):

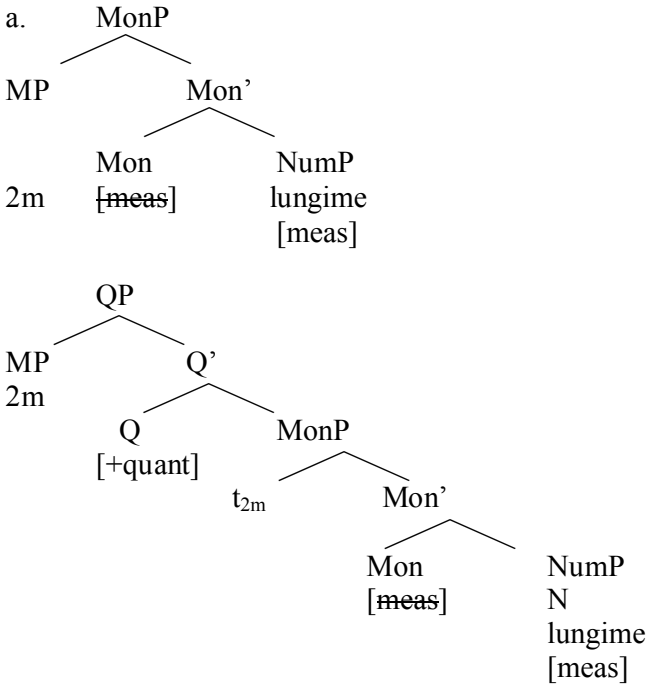
(77) a. doi metri lungime
two meters length
b. lungime doi metri
length two meters

Given the inherent dimensional nature of these nouns, as well as the fact that they are uncountable in this construction, it is clear that the interpretation of the construction is monotonic, at least in the sense in which these NPs are *predicates of scalar intervals*.

Our proposal is that nouns which denote monotonic dimensions inherently *may check the Mon head themselves*. This is what accounts for the lack of the preposition *de*, which in our analysis spells out the [measure] feature of the Mon head.

The assumptions needed are minimal. The partitive MP is introduced as always in the Spec, Mon P position. The [measure] feature of the Mon head is checked by an inherent semantic feature of the dimensional noun. This directly yields the order *MP + dimensional noun* in (77), (78). The MP further checks a quantity feature in Spec, QP, as in (78b).

(78) a.

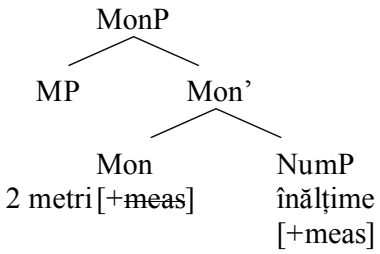


The second construction, exhibiting the order *dimensional noun* + *MP*, requires additional movement, as also suggested in Corver (2006). One may propose head movement to some F head, or phrasal movement to a specifier position. Given that the dimensional noun may be modified by adjectives (as in 80a, b below), it is likely that NP movement, rather than N-Movement is involved, as sketched in (81b).

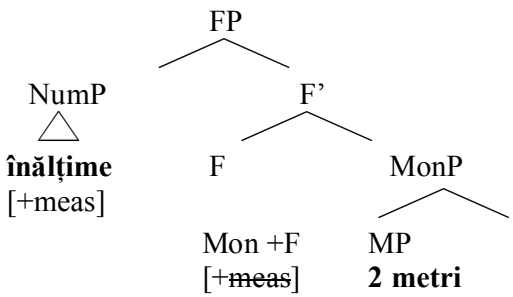
(79) a. doi metri înălțime
two meters height
b. înălțime doi metri
height two meters

(80) a. Camera are doi metri **înălțime utilizabilă**.
room.the has two meters height usable
b. Camera are **înălțime utilizabilă** doi metri.
room.the has height usable two meters

(81) a.



b.



A third property worth mentioning is that either half of the structure can be split and fronted.

(82) a. Copacul **înălțime** avea **numai doi metri**.
tree.the height had only two meters
b. Copacul **numai doi metri** avea **înălțime.**
tree.the only two meters had height

The derivational mechanisms are as described earlier for the prepositional structures.

The analysis of Romanian dimensional nouns has revealed a possibility of parametrizing Measure partitives according as they check the [measure] feature under the Mon head. This feature may be checked by a semantically appropriate noun (uncountable, dimensional) or by a preposition (*de*, in Romanian). Notice the complementary distribution of measure nouns in Romanian/ French. French employs the prepositional monotonic construction, Romanian employs the non-prepositional one.

(83) French
a. *deux mètres hauteur (apud Corver 2006)
two meters height
b. deux mètres de hauteur
two meters of height
(84) Romanian
a. doi metri înălțime
two meters height
b. *doi metri de înălțime
two meters of height

6. The measure phrase adjectival construction

6.1 Varieties of measure phrase adjectival constructions

The discussion in the first part of the paper has shown that only a handful of adjectives allow the MP as a direct modifier. These are the adjectives that are subject to the type shifting rule, conceptualizing their internal variable as an interval I. The MP measures out this internal interval. We expect these adjectives to appear in a MP partitive construction, which they do. However, they also appear in a structure whose order is that of the attributive nominal construction. Both structures are productive. The MP may be questioned with ease in either structure. Split DPs may be based on both patterns, so the data we propose to discuss in this section are given below:

(85) a. perdele **doi metri de lungi**
curtains two meters of long
b. perdele **lungi de doi metri**
curtains long of two meters
(86) a. **Doi metri** erau **de lungi** (from doi metri de lungi)
two meters were. of long
'They were two meters long'
b. **Lungi** erau **de doi metri**
long were of two meters
(87) a. **Cât** erau perdelele **de lungi**?
how were curtains.the of long
'How long were the curtains?'
b. **Cât de lungi** erau perdelele?
how of long were the curtains

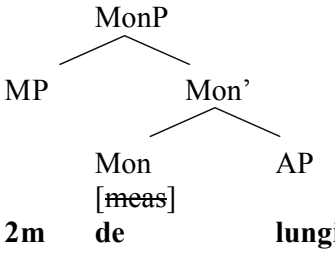
In this section we will show that in both cases we are dealing with a regular monotonic construction. The main difference lies in the syntactic category of the measure phrase: it is a NP in the regular *MP+ adjective* structure (*doi metri de lung* 'two meters of long'), and it is a PP in the "attributive" construction. (*de doi metri lung* 'of two meters long → *lung de doi metri* 'long of two meters').

One should also notice that the few adjectives that allow direct MP modification are some of the most frequent dimensional adjectives, therefore they are adjectives which could check a [measure] feature and assign a [Measure] role to a NP that they select. The prediction is that they might in principle occur in a non-prepostional monotonic construction as well. This is indeed, the case even if the non-prepositional constructions is accepted only in technical styles and is otherwise felt as degraded.

6.2 The partitive MP construction

The first pattern is not problematic it looks like a regular partitive MP construction, exhibiting the order *MP+ de + Adjective*. As before, *de* is in the first place the spell-out of Mon-head, in the basic structure in (50=4). It is also required for anti-agreement, which prevents the phi-features of the head adjective from spreading to the nominal MP, which has a different ϕ-set:

(88)



The split construction in (86a) (*2m erau de lungi*), is not problematic, the MP raises to an operator edge position inside the AP and is then attracted to the LP of the clause, as previously discussed for the nominal structure in (61), (62). The same analysis underlies the question in (87a).

6.3 The prepositional MP. The attributive-like construction

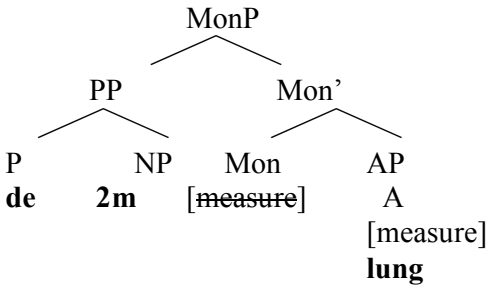
As already said the adjectival construction in (1b) looks like an attributive construction. Yet the adjective cannot be "countable" and the interpretation is monotonic. We will assume that the most important property of the construction is the semantics of the head, the fact that the adjective may assign a measure role itself, also checking the [measure] feature of the Mon head. The one significant difference between this construction and the preceding one is precisely that in this case the measure role is assigned by the adjective, while the MP position is occupied by the PP. Since the PP is a head+complement structure, it must appear *after* the adjective, so that the AP will move to some higher functional FP. Notice that other PPs or CP may also occupy the MP position.

(89) a. lung de doi metri
long of two meters
b. lung pana in podele
long to the floor

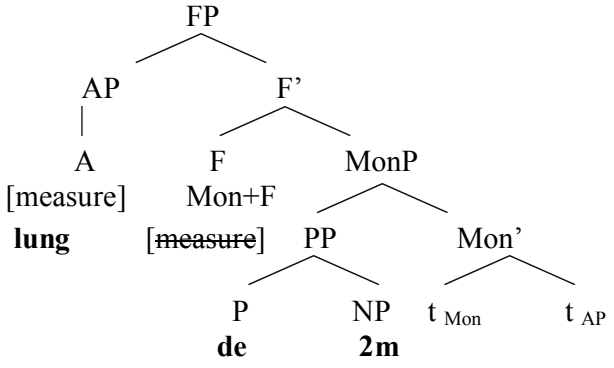
(90) a. înalt de doi metri
tall of two meters
b. înalt cât bradul
tall how fir tree.the
'as tall as the fir-tree'
c. înalt cât se poate
tall how SE.refl is-possible
'as tall as is possible'

The derivation of this structure is maximally simple the constituent which functions as a MP (whether a PP, a CP, a DegP) merges in Spec Mon P. It will receive a Measure interpretation from the Mon head, whose formal feature is valued by the corresponding inherent feature of the dimensional adjective. The lexical head moves leaving behind the prepositional MP.

(91)



(92)



The PP measure phrase construction should be related to the genitive of Measure, possible with adjectives in other languages. " In older phases of the Germanic languages, this pre-adjectival MP carried genitival case. This was the so-called 'genitive of measure'. Here is an example from Old Swedish. The Romanian *de* is thus a genitive case marker of a measure role.

(93) *twäggia* *ara* *gamall* (apud Corver 2006: 16).
two-gen years-gen old
'two years old'

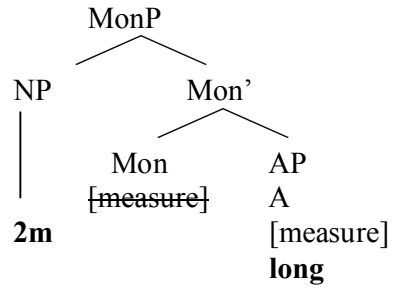
The same type of adjectival constructions are possible in other Romance languages.
It is important that exceptionally, the basic order PP+A appears, confirming that *de* is part pf the measure phrase, rather than the speller of the partitive head. Also the *de* PP regularly functions as a predicative measure phrase after the copula:

(94) Camera era **de patru metri lungă** şi **de trei metri lată**.
room.the was of four meters long and of three meters wide
'The room was four meters long and three meters wide.'
(95) Copilul era **de trei ani.**
child.the was of three years
'The child was three years old.

6.4 The non-prepositional construction

English differs minimally, projecting a NP, rather than a PP measure phrase in Spec Mon P, and checking the [measure] feature by Agree, not followed by movement.

(96)



The English structure possible is in Romanian technical discourse, but marginal otherwise. Both orders are possible, but equally degraded.

(97) a. ???Camera era **numai 2m înaltă**.
room.the was only 2m tall
b. ???Camera era **înaltă 2m**.
room.the was tall 2m.
c. Dimensiunile camerei sunt **4m lung** pe **3m lat.**
dimensions.the room.the.Gen are 4m long by 3m wide.

The non-prepositional structure is considerably better if a DegP is used as a MP. Thus, the MP may also be represented by the degree words *aşa* 'that much', *atâta* 'that much' both of them with a deictic interpretation. These formatives are perfect in the juxtaposed structure, *aşa* 'that much' appears both in pre-adjectival and in post-adjectival constructions, *atâta* 'that much' appears after the adjective: Both function as degree words denoting an interval, specified by the context:

(98) a. Bufetul este **aşa lung** şi **aşa lat**. (deictic aşa +ostension)
sideboard is that much long and that much wide.
b Bufetul este **lung aşa** şi **lat aşa**.
sideboard is long that much and wide that much.
c. Bufetul este **lung atâta** si **lat atâta**. (deictic atâta +ostension)
sideboard is long that much and wide that much

This is also a monotonic partitive construction, differing only with respect to the syntactic category which represents the measure phrase, and the means of assigning the measure role. In this case the measure role is directly assigned by the adjective through the agency of the Mon head.

7. Conclusions

(i) The paper has presented a detailed semantic analysis of the syntax and interpretation of measure phrases inside DPs and APs

(ii) The measure phrase construction is trans-categorial so that a semantic understanding of the properties of the construction is welcome. Paradoxically, the best starting point proved to be the analysis of the nouns, because it is DPs that throw light on the essential difference between the "attributive construction", measuring out *rigid dimensions*. and "measure-phrase partitive construction", measuring out *monotonic dimensions*.

(iii) Semantically, MPs are *predicates denoting sets of degrees*, their arguments are conceptualized as gaps or *intervals*, not simple degrees. This makes MP compatible with the comparative, which denotes the gap between the respective two degrees of the same property on a scale. Since the positive degree is about simple (maximum) *degrees*, not intervals, adjectives in the positive do not normally accept direct measure phrase modification. A limited group of adjectives have secondary meanings referring to intervals (sets of degrees), rather than mere degrees. These are the few adjectives which accept *direct MP modifiers*.

(iv) There are two types of interpretations associated with MPs, *monotonic interpretations*, characteristic of *Partitive MPs* and *non-monotonic interpretations*, characteristic of *Attributive MPs.* The measure phrase partitive is a subtype of the pseudo-partitive construction. A consideration of the family of monotonic constructions shows important formal similarities between the proper partitive, the pseudo-partitive and the measure-phrase partitive, stemming from the fact that they all develop formal elements available in the structure of the prototypical monotonic construction, the scale of the cardinal numerals.

(v) The formal similarities among monotonic constructions, for instance the transcateogorial similarities of phrases that contain MPs are due to the fact that they share a functional projection, the Monotonicity Phrase; the head of MonP, Mon^0, is a syntactic a *functional head that assigns a sort of measure θ-role to a measure phrase (MP) or to a Q_AP.* This functional head is part of the extended projection of any of the lexical categories occurring in monotonic constructions. The Mon head contains an un-interpretable [+measure] feature which may be checked off by external Merge of the functional preposition *de*. Even if prototypically MPs are NPs, other syntactic categories, *in particular PPs*, may also fill the Measure role.

(vi) Regarding the syntax of DPs containing measure phrases, the privileges of occurrence with a MP are not the same for different categories of nouns. The following are relevant nominal properties: a) possession of monotonic vs. non-monotonic dimensions; b) countability. c) the difference between dimensional nouns (*length*, *breadth*, etc.) and nouns which merely have monotonic properties (*trees*, *rivers*, etc.). The syntax of dimensional nouns is very different when occurrence with MPs is considered.

(vii) Attributive MP and Partitive MPs have very different syntax. Partitive MPs are possible with both DPs and APs. Partitive MP merge as specifiers of the MonP and are assigned a Measure role by the Mon head. *Attributive MPs, which measure out rigid dimensions of countable nouns, are possible only with lexical nominal heads.* Attributive MPs are PPs, not NPs. Attributive MPs are adjuncts of nominal heads, on a par with adjectives and other modifiers.

(viii) The analysis of the Romanian measure phrase partitive constructions reveals a possibility of parametrizing them according as the [measure] feature of the Monotonicity head is checked out by inserting the functional preposition *de*, or is checked out by a matching inherent feature of dimensional nouns and adjectives. A second relevant parameter is the syntactic category of the MP: it is a NP (with both nominal and adjectival heads) or a PP (with adjectival heads).

References

Abney, S. 1987. The English Noun Phrase in its Sentential Aspects. PhD dissertation, MIT .

Aboh, E. 2004. Topic and Focus within DP. *Linguistics in the Netherlands* 21: 1-12

Alexiadou A., Haegeman L., Stavrou M. 2007. *Noun Phrase in a Generative Perspective*. Berlin: Mouton de Gruyter.

Borer, H. 2005. *Structuring Sense. In Name Only*. Oxford: Oxford University Press.

Cornilescu, A. 2003. Romanian genitive constructions revisited. *Bucharest Working Papers in Linguistics* V(1): 104-128.

Cornilescu, A. 2006. Din nou despre *un prieten de-al meu*. In G. Pană-Dindelegan (ed.), *Limba română – aspecte sincronice şi diacronice*, 25-37. Bucharest: Editura Universităţii din Bucureşti.

Cornilescu, A. 2007a. Despre trăsăturile periferice si cum le-am putea folosi. In C. Stan, R. Zafiu, A. Nicolae (eds.), *Studii lingvistice. Omagiu Profesoarei Gabriela Pană Dindelegan la aniversare,* 43-56. Bucharest: EDituat Universităţii din Bucureşti.

Cornilescu, 2007b. The syntax of comparative constructions. Ms., University of Bucharest.

Corver, N. 1998. Predicate movement in pseudo-partitive constructions. In A. Alexiadou and C. Wilder (eds.) , *Possessors, Predicates and Movement in the Determiner Phrase*, 215-257. Amsterdam: John Benjamins.

Corver, N. 2006. Getting the measure of Measure Phrases. Ms., University of Utrecht.

Doetjes J., Rooryck, J. 2003. Generalizing over quantitative and qualitative constructions. In M. Coene and Y. D'Hulst (eds.), *From NP to DP*, vol. I, 277- 295. Amsterdam: John Benjamins.

Dogaru, M. 2007. The Category of Number, its Relevance for the Syntax and the Semantic Typology of the Nominal Group. PhD dissertation, University of Bucharest.

Giurgea, I. 2008 Recherches sur la structure interne des pronoms et des expressions nominals sans nom exprimé. PhD dissertation, Paris 7.

Giurgea I., Nedelcu, I. 2008. Elipsa nominală şi construcţia partitivă. Handout of a talk presented at the *Annual Conference of the Romanian Department*, December, Bucharest.

Giusti, G. 1996. Is there a Focus and a Topic phrase in the Noun Phrase? Ms., University of Venice

Giusti, G. 2002. The functional structure of Noun Phrases. A bare phrase structure approach. In G. Cinque (ed.), *Functional Structure in DP and IP*, 54-90. Oxford: Oxford University Press.

Gramatica Limbii Române, Enunţul 2005. Bucharest: Editura Academiei Române.

Grimshaw, J. 2005 *Words and Structures* Stanford: CSLI Publications.

Higginbotham, J. 1985. On semantics. *Linguistic Inquiry* 16: 547-593.

Hulk, A., Tellier, C. 2000. Mismatches: Agreement in qualitative construction. *Probus*:12(1): 33-65.

Ihsane, T., Puskas, G. 2001.Specific is not definite. *GenGenP* 2: 39-54.

Jackendoff, R. 1977. *X'-Syntax: A Study of Phrase Structure*. Cambridge, Mass.: MIT Press.

Kayne, R. 2003. On the syntax of quantity in English. Ms., NYU.

Kennedy, C. 1997. *Projecting the Adjective: the Syntax and Semantics of Gradability and Comparison*. New York: Garland.

Kennedy, C. 2001. Polar oppositions and the ontology of degrees. *Linguistics and Philosophy* 24 (1): 33-70.

Kupferman, L. 1999. Réflexions sur la partition: les groupes nominaux partitifs et la relativisation. *Langue Française* 122: 30-51.

Koptjevskaja-Tamm, M. 2001. *A piece of cake* and *a cup of tea*: partitive and pseudo-partitive nominal expressions in the Circum-Baltic languages. In O. Dahl and M. Koptjevskaja-Tamm (eds.), *Circum-Baltic Languages. Vol.2. Grammar and Typology*, 523-568. Amsterdam: John Benjamins.

Löbel, E. 2001.Classifiers and semi – lexicality: Functional and semantic selection. In N.Corver and H.van Riemsdijk (eds.), *Semi- Lexical Categories*, 223-272. Berlin: Mouton de Gruyter.

Matushansky, O. 2002a. Movement of Degree/ Degree of Movement. PhD dissertation, MIT.

Matushansky, O. 2002b. Tipping the scale: The syntax of scalarity in the complement of *seem*. *Syntax* 5 (3): 219-276.

Mardale, A. 2007. *Les prépositions fonctionelles du roumain.* PhD dissertation, Paris 7.

McNay, A. 2005. Split topicalization - motivating the split. *Oxford University Working Papers in Linguistics*, *Philology and Phonetics* 10: 39-58.

McNay, A. 2006. Information structure at the phase level. Ms.,University of Oxford.

Rizzi, L. 1990. *Relativized Minimality*. Cambridge, Mass.: MIT Press.

Ross, J. R, 1967. Constraints on Variables in Syntax. PhD dissertation, MIT.

Selkirk, E. 1977. Some remarks on Noun Phrase structure. In P.W. Culicover, T. Wasow and A. Akmajian (eds.), *Formal Syntax*, 285-316. New York: Academic Press.

Schwarzschild, R. 2005. Measure Phrases as modifiers of adjectives. *Recherches Linguistiques de Vincennes* 34: 207-288.
Schwarzschild, R. 2006. The role of dimensions in the syntax of Noun Phrases. *Syntax* 9 (1): 67-110.
Stavrou, M. 2003. Semi-lexical nouns, classifiers, and the interpretation(s) of the pseudopartitive construction. In M. Coene and Y. D'Hulst (eds.), *From NP to DP*, vol.1, 329-353. Amsterdam: John Benjamins.
Zamparelli, R. 1993. Prenominal modifiers, Degree Phrases and the structure of the AP. *University of Venice Working Papers in Linguistics* 3: 138-161.
Zamparelli, R. 1995. Layers in the Determiner Phrase. PhD dissertation, University of Rochester.
Zamparelli, R. 1998. A theory of kinds, partitives and possessives. In A. Alexiadou and C. Wilder (eds.), *Possessors, Predicates and Movement in the Determiner Phrase*, 261-302. Amsterdam: John Benjamins.