

# Monotonicity of Measures in Pseudo-Partitives as a Consequence of Polysemy: Evidence from Romanian

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38<sup>th</sup> Meeting of the North East Linguistic Society, University of Ottawa, October 26 2007

## 1 THE PHENOMENON AND THE BASIC PROPOSAL

The two goals of this presentation<sup>1</sup> are:

- to argue that, syntactically, the measure expression is the lexical head of the extended projection in Romanian pseudo-partitive constructions like (1) – much as the leftmost noun is the lexical head of true partitive constructions like (2);
- to propose a semantics for pseudo-partitives that accommodates this syntactic generalization.

**Pseudo-partitives** (e.g. (1) below): "pseudo" because they do not refer to a part of a particular multi-part object / collection – since there is no given multi-part object / collection to take a part of.

- pseudo-partitives contrast with true partitives (e.g. (2) below), which do refer to a part of given multi-part object / collection, which is the denotation of the definite DP;
- pseudo-partitives are not about parts of larger whole (like the true partitives), but about partitions of an underlying domain of individuals: *liters of water* is about partitioning water into liters, *boxes of books* is about partitioning books into boxes, *cups of coffee* is about partitioning coffee into cups etc.

In Romanian, the preposition *de* appears only with pseudo-partitives, while the preposition *din / dintre* appears only with true partitives. This is shown by the contrast between (1)-(3) on the one hand and (2)-(4) on the other: as Ladusaw (1982) observes, partitive structures allow only referential, definite DP's as their second DP, while pseudo-partitive structures disallow them.

### 1. pseudo-partitive:

zece grame **DE** brânză (de capră)  
ten grams of cheese (of goat)  
ten grams of goat cheese

### 2. partitive:

zece grame **DIN** această brânză (de capră)  
ten grams of this cheese (of goat)  
ten grams of this goat cheese

### 3. #zece grame **DIN** brânză (de capră)

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<sup>1</sup> I am grateful to Jane Grimshaw, Beth Levin and Roger Schwarzschild for their detailed comments on various versions of this work and to Camelia Constantinescu, Sam Cumming, Mihaela Tănase-Dogaru and the audience of *The Syntax and Semantics of Measurability* workshop (Tromsø, September 2007) for discussion. I am indebted to Sam Cumming and Megan Moodie for the English acceptability judgments and Camelia Constantinescu for some of the Romanian acceptability judgments. The support of the Stanford Humanities Fellows program for parts of this research is gratefully acknowledged. The usual disclaimers apply.

4. #zece grame **DE** această brânză (de capră)

### The main contributions:

- arguing that measure expressions have individual-based denotations in pseudo-partitives;
- deriving from the degree-to-individual meaning shift the observation in Schwarzschild (2006) that measure expressions are used *monotonically* in pseudo-partitives.

Monotonicity is relative to the part-whole structure associated with the domain of individuals denoted by the non-measure common noun (e.g. *cheese* in (1) and (2) above). Monotonic use means that the measuring tracks this part-whole structure, e.g. you take two different amounts of water, each one liter in volume, and if you put them together, you get more water that has a greater volume.

Correspondingly, in a non-monotonic use of a measure, the measuring does not track the (contextually salient) part-whole structure associated with the domain of individuals contributed by the common noun, e.g. you take two different amounts of water, each having a 20°C temperature, and if you put them together, you get more water with the same temperature.

That is, the background puzzle introduced in Schwarzschild (2006) is: why are (5) and (6) below felicitous, but not (7)?

5. doi litri de apă  
two.m liter.m.pl of water.f.sg  
two liters of water
6. apă de două grade  
water.f.sg of two.f degree.f.pl  
two degree water
7. #două grade de apă  
two.f degree.f.pl of water.f.sg  
#two degrees of water
8. the basic structure of these constructions:  $N_1$  *de*  $N_2$

### The proposal:

- in pseudo-partitive  $N_1$  *de*  $N_2$  constructions,  $N_1$  is the lexical head of the entire pseudo-partitive extended projection;
- the measure noun  $N_1$  shifts from a degree-based to an individual-based denotation, i.e. from denoting a set of intervals on a scale to denoting a set of individuals, when this extended prejection is an argument of a predicate that semantically selects for an individual-based denotations, e.g. *I drank two liters of water*;
- the degree-to-individual meaning shift can happen only if the measuring tracks the part-whole structure of the  $N_2$  noun.

Syntactically and semantically, the measure expression is the head of the pseudo-partitive while the other nominal expression is the non-head, in contrast to Schwarzschild (2006), where the head/non-head categorization is reversed.

For example:

- in *three kilograms of cheese*, *three kilograms* is not a degree-/measure-denoting expression, but it refers to three lumps of cheese, each weighing one kilogram; we individuate these three lumps, i.e. these three individuals, by means of the weight measure;
- individuation by measure fails in (7) because there is no way to identify materially non-overlapping amounts of water (a.k.a. individuals) that is exclusively based on temperature measuring – since temperature measuring does not track the water part-whole structure.

The degree-to-individual meaning shift is a **polysemic meaning shift**, e.g. using the noun *newspaper* to refer to both a particular token of a particular issue of a newspaper and the financial institution publishing it, as in (9) below (see Green 1989: 48, (10b)).

9. The newspaper Jan's reading almost went bankrupt in 1983.

Or using the noun *glass* to refer to both the container and its content, as in (10) below (see Green 1989: 48, (10a)).

10. [There is some lemonade on the table.] Pick up a glass (of lemonade) and pour it into the pitcher.

Or using the noun *book* to refer to events of reading (parts of) books, as in (11) below (example (3.7) in Asher 2007: 68, attributed to George Bronnikov; see also Pustejovsky 1995).

11. George enjoyed many books last weekend.

## 2 THE ANALYSIS

### 2.1 Syntactic and Semantic Properties of Romanian Pseudo-Partitives

**The number and gender agreement properties of pseudo-partitives** indicate that the measure expression is the head of the (main) extended projection in pseudo-partitive constructions:

- in (12) below, the pronominal clitic *i* (they.m.pl) and the definite article *cei* (the.m.pl) agree with the measure noun *litri* (liter.m.pl) and not with the noun *apă* (water.f.sg).

12. (Cei)        doi   **litri**        de apă,        Ion tocmai   **i**        = a        băut / \*a        băut        = **o**.  
(The. m.pl) two.m liter.**m.pl** of water.**f.sg**, John just they.**m.pl** = HAVE drunk / \*HAVE drunk = it.**f.sg**  
John just drank (the) two liters of water.  
(More precisely: (the) two liters of water, John just drank them).

But the measure expression is not the head of constructions in which measures are non-monotonic:

- in (13) below, the pronominal clitic *o* (it.f.sg) and the indefinite article *o* (a.f.sg) agree with *apă*.

13. O        (sticlă        de) apă        de doi        **litri**,  
A.f.sg (bottle.f.sg of) water.**f.sg** of two.m liter.**m.pl**,  
Ion tocmai a băut        = **o**        / \***i**        = a        băut.  
John just HAVE drunk = it.**f.sg** / \*they.**m.pl** = HAVE drunk

John just drank a two liter (bottle of) water.  
 (More precisely: a two liter (bottle of) water, John just drank it)<sup>2</sup>.

Similarly, predicative adjectives always agree in gender and number with the  $N_I$  noun in both monotonic and non-monotonic uses of measure expressions, as shown in (14) and (15) below (these examples are variations on example (35c) in Tănase-Dogaru 2007: 13).

14. (Cei) doi **litri** de **apă** erau vărsați / \*era vărsată pe podea.  
 (The.m.pl) two.m liter.**m.pl** of water.**f.sg**, were spilled.m.pl / \*was spilled.f.sg on floor.  
 The two liters of water were spilled on the floor.
15. O **apă** de doi **litri** era vărsată / \*erau vărsați pe podea.  
 A.f.sg water.**f.sg** of three liter.**m.pl** was spilled.f.sg / \*were spilled.m.pl on floor.  
 A two liter water was spilled on the floor.

Cross-sentential anaphora instantiates the same agreement pattern, as shown in (16) and (17) below.

16. Megan a cumpărat trei litri de apă. Linus i=a vărsat / #a vărsat = o (pe podea).  
 Megan HV bought three liter.**m.pl** of water.**f.sg** Linus they.**m.pl**=HV spilled / #HV spilled = it.**f.sg**  
 Megan bought three liters of water. Linus spilled them / #it (on the floor).
17. Megan a cumpărat o apă de trei litri. Linus a vărsat = o / #i=a vărsat (pe podea).  
 Megan HV bought a.f.sg water.**f.sg** of three liter.**m.pl** Linus HV spilled=it.**f.sg** / #they.**m.pl**=HV spilled  
 Megan bought a three liter water. Linus spilled it / #them (on the floor).

The topic-comment structure in (12), the predicative structure in (14) and the cross-sentential anaphora in (16) indicate that:

- pseudo-partitives can be used referentially;
- they refer to individuals, not intervals on a scale (as Schwarzschild 2006 would have it);
- the entities they refer to are individuated by the measure expression (a count noun) and not by the other nominal expression (a mass noun).

These observations are further supported by the fact that pseudo-partitives can be embedded in partitive structures, which allow only for referential, definite NP's – see (18) below<sup>3</sup>.

18. doi **din** cei cinci litri de apă  
 two.m of the.m.pl five liter.m.pl of water.f.sg  
 two of the five liters of water

- note the agreement pattern in (18): the indefinite cardinal *doi* (two) agrees in gender with the masculine noun *litri* (liters), not the feminine noun *apă* (water).

<sup>2</sup> Out of the blue, example (13) is not completely acceptable because indefinites do not make very good sentential topics. The sentence is perfectly acceptable if the topic is a definite, i.e. *apa de trei litri*, ... (the three liter water, ...) – I prefer the indefinite version because the gender & number morphology on the indefinite article can be explicitly distinguished from the corresponding morphology on the common noun.

<sup>3</sup> Distributive universal quantifiers are, in fact, also acceptable in true partitive constructions:

- (i) doi **din** fiecare cinci litri de apă  
 two.m of each five liter.m.pl of water.f.sg  
 two of every/each five liters of water.

In contrast, the  $N_2$  position in pseudo-partitives is non-referential (see (4) above) and we cannot further embed definite pseudo-partitives in  $N_2$  pseudo-partitive positions – as shown in (19) below.

19. #doi     **de** cei cinci litri     de apă  
two.m   of the five liter.m.pl of water.f.sg  
two of the five liters of water

Two other uses of measure expressions provide evidence that we independently need an operation that maps degree-based denotations for measure expressions to individual-based denotations:

- individual-denoting measure expressions can be used by themselves – see (20) and (21) below.

20. Megan bought two kilos of cherries and Linus already ate *one kilo*.

21. [Pointing at the two kilos of cherries Megan bought, Gabby says:] I only bought one kilo.

- a measure expression can provide the restrictor of a quantifier over individuals – see (22) and (23) below (naturally occurring examples, courtesy of [www.google.com](http://www.google.com)).

22. The Allies massed 3091 guns, or one to *every six yards of an eleven mile front*.

23. There was a policeman *every two yards*, on both sides of the road.

- the corresponding "bare measure" and "quantified measure" constructions in Romanian are also felicitous; in general, such bare/quantified measure constructions seem to be possible only with monotonic uses of measure expressions – see (24) and (25) below.

24. #An alarm sounded every 10°C.

25. The temperature was rising and so was the mercury in the thermometer. The thermometer was designed in such a way that an alarm sounded every 10°C.

The above observations, namely:

- pseudo-partitives can be used referentially
- when used referentially, they refer to individuals
- the entities they refer to are individuated by the measure expression (a count noun) and not by the other nominal expression (a mass noun)

undermine the semantic selection tests that are taken in the literature to support the idea that the  $N_2$  noun is the lexical head of the (unique) pseudo-partitive extended projection: *three liters of water* refers to three portions of water each one liter in volume (as the number and gender of the anaphoric pronouns indicate) and the noun *liters* can very well satisfy the s-selection constraints imposed by the verb *drink*.

The nouns *liter* and *kilogram* can refer to portions of water and cheese respectively, just as *pot* can refer to a portion of coffee and *pack* can refer to a number of cigarettes.

Meaning shifts and the *antagonism* between the two readings of a word involved in the shift are gradient notions (see Cruse 2000 and chapter 5 in Croft & Cruse 2004 for more discussion)<sup>4</sup>, with the "tome" / "text"

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<sup>4</sup> I am indebted to Beth Levin for discussion of this point (p.c.).

meaning facets of the noun *book* at one end and the "food" / "people" meanings of *ham sandwich* (see Nunberg 1977 and Sag 1981) at the other.

The degree-to-individual meanings shift seems to be located somewhere in between the two extremes of the spectrum, very closely related to the "container" / "content" meaning shift that nouns like *cup*, *glass*, *box* etc. undergo – see, for example, the close parallel between the acceptability judgments associated with (28) and (29)/(30)/(31) below.

## 2.2 Degree-to-Individual Meaning Shifts as Polysemy

- on the one hand, measure expressions denote intervals, i.e. (convex) sets of degrees, on a particular measuring scale;
- on the other hand, they refer to individuals;
- the two meanings are just different senses of the same word, i.e. the degree-to-individual meaning shift is an instance of polysemy<sup>5</sup>.

The usual tests show that the two meanings are an instance of polysemy and not homonymy.

- for example, the accidentally polysemous (i.e. homonymous) word *case* in (26) below is infelicitous, while the (logically) polysemous words *city* in (27) and *glass* in (28) are felicitous (these sentences are based on examples in Green 1989 and Asher 2007).

26. #The lawyer's case, which was made of genuine leather, suffered from logical flaws.

27. The city, which has 500.000 inhabitants, outlawed smoking in bars last year.

28. [There was some lemonade on the table.] Linus picked up a glass and drank it in one gulp.

- similarly, the sentences in (29), (30) and (31) below are felicitous.

29. The lump of cheese was two kilograms and Linus ate both of them in one sitting last night.

30. The cable's length was two meters, one of which Megan used to fix the car.

31. The milk in the bucket was worth ten dollars, which Gabby tucked away safely in the inner pocket of her jacket.

Just as *bottle / glass (of wine)* can be used to refer to both a measure and a portion of wine – in addition to referring to a container –, *kilogram*, *liter* etc. can be used to refer to both measures / scalar intervals and individuals.

## 2.3 Deriving the Monotonicity Constraint on Pseudo-Partitives: Individuation by Measure

- I assume that nouns denoting sets of individuals always associate a part-whole structure with these sets (following Schwarzschild 2006; see also Climent 2001 and references therein)

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<sup>5</sup> I take the degree-based denotation to be the primary one, although this denotation is sometimes established by means of a Kripkean baptism involving an actual individual, e.g. "meter" was defined between 1889 and 1960 as the distance between two lines on a platinum-iridium bar (the "International Prototype Meter") preserved at the International Bureau of Weights and Measures near Paris.

- for mass nouns, this is the material-part lattice structure introduced in Link (1983);
- for count nouns, the part-whole structure is trivial: every individual is a part of itself and of no other individual.

The basic, primary denotations of measure expressions, e.g. *liter*, *degree* etc., are sets of scalar intervals. That is, measure expressions are predicates of intervals on the relevant scale of measuring (this is the only kind of denotation that measure expressions have in Schwarzschild 2006).

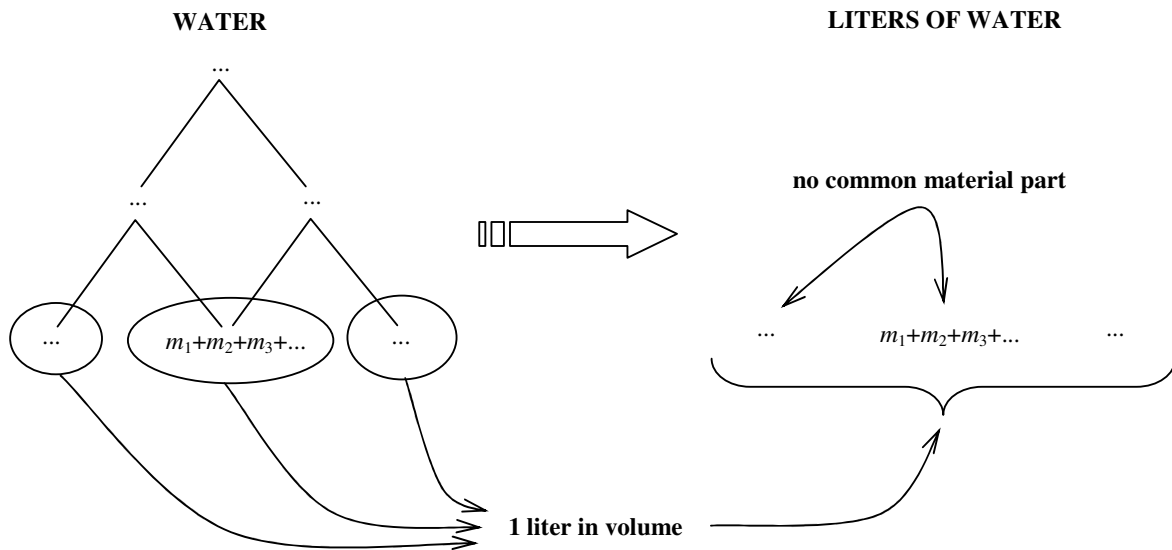
The **nominalization** of a measure expression is the degree-to-individual polysemic shift exemplified above. More precisely:

- the **nominalization** of a measure expression is the semantic operation by which measure expressions are associated with predicates of individuals;
- these predicates of individuals are obtained by restricting the domain of individuals and its associated part-whole structure contributed by the other nominal phrase in the pseudo-partitive<sup>6</sup> to a sub-domain and a sub-structure that are materially equivalent (in the sense of Link 1983) to the original structure – that is, for any material part  $m$ :  $m$  is a material part of some individual  $x$  in the original domain iff  $m$  is a material part of some individual  $y$  in the sub-domain;
- since *liter*, *kilogram* etc. are count nouns, the resulting sub-structure has a count part-whole structure, i.e. no two distinct elements in its domain have a common material part;
- thus, the resulting sub-structure is a **material partition** of the original, underlying domain of individuals (because it is materially equivalent to it and no elements have a common material part);
- the individuals that form the partition cells have to also be individuals in the original part-whole structure: five kilograms of cheese are still cheese;
- finally, each individual in the partition measures exactly one unit according to the measure function involved in the original degree-based denotation of the measure expression, e.g. if the sub-structure consists of portions of water, each portion measures one liter.

**In sum**, the nominalization of a measure expression is the degree-to-individual polysemic shift that applies to a given domain of individuals and its associated part-whole structure and yields a sub-domain and sub-structure that is a material partition of the input domain of individuals and the output individuals measure exactly one unit according to the measure function involved in the original degree-based denotation of the measure expression.

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<sup>6</sup> That is, the underlying domain of individuals and its associated part-whole structure are provided by  $N_2$  in pseudo-partitive constructions – but they can also be provided by the discourse and / or utterance context, e.g. when the measure expression appears by itself in (20), (21) and (23) above.



### Parallels between measure nominalizations and denominal verbs:

- the nominalization of a measure is parallel to the denominal verb formations discussed in Hale & Keyser (1993), for example:
32. put the books on a *shelf*       $\Rightarrow$     *shelve* the books
33. put the wine in *bottles*       $\Rightarrow$     *bottle* the wine
- this noun-to-verb shift involves the objects specified in the TELIC qualia of the input noun (Pustejovsky 1995) – and the direct object of the output verb has to match these telic objects;
  - similarly, the measure-to-noun shift involves something like the nominal TELIC qualia: a measure expression is used to measure a particular kind of entities in a particular way.

### Parallels between degree-to-individual shifts and individual-to-event shifts:

- the fact that we preserve part of the measure-related meaning in degree-to-individual mappings (since the resulting individuals measure one unit according to the original measuring function) is parallel to the way in which we preserve the individual-level structure in the individual-to-event meaning shift involved in (11) above, repeated in (34) below for convenience:
34. George enjoyed many books last weekend.
- sentence (11/34) cannot be true in a situation in which George read many times from the same book – we need distinct books to be involved in the many distinct events of readings that George enjoyed last weekend (see Asher 2007: 68).

Besides having to preserve some of the structure associated with the denotation that is to be shifted (in our case: degree-based denotations), meaning shifts are constrained by the structure associated with the kind of denotation into which we shift.

- five kilograms of cheese are cheese, just as, when we shift from cigarettes to eventualities of smoking a cigarette, these eventualities are *events* and not processes and just as, when we shift from fame to eventualities of acquiring fame, these eventualities are (usually) processes and not events.



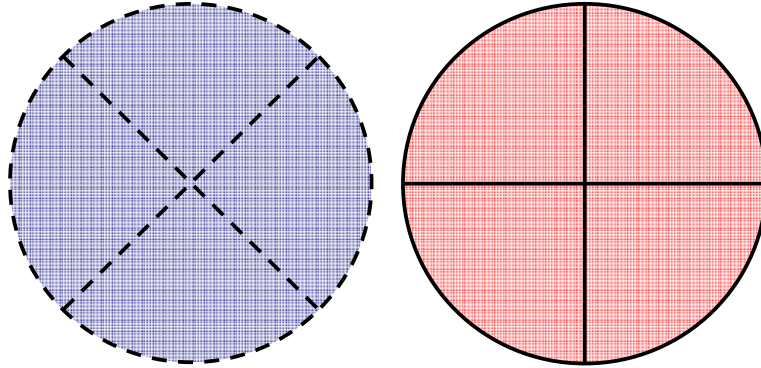
35. Linus enjoyed a quick / #gradual / #sudden cigarette.

36. The publication of Megan's first book brought Linus gradual / sudden fame.

To the above definition of nominalization, I will only add a principle of **individuation by measure** that constrains measure-based polysemy.

**Individuation by measure:** if there are multiple possible partitions that could in principle be the result of a measure nominalization, all such possible partitions have to have an equal number of partition cells.

Partitioning into kilograms a four kilogram lump of cheese



The intuitive justification for the individuation-by-measure principle is that, in the degree-to-individual meaning shift, the measuring has to be a *sufficient* criterion for individuation: given that any cell measures one unit (one kilogram, one liter etc.), if all the possible output partitions have the same number of cells, we can just arbitrarily choose any partition.

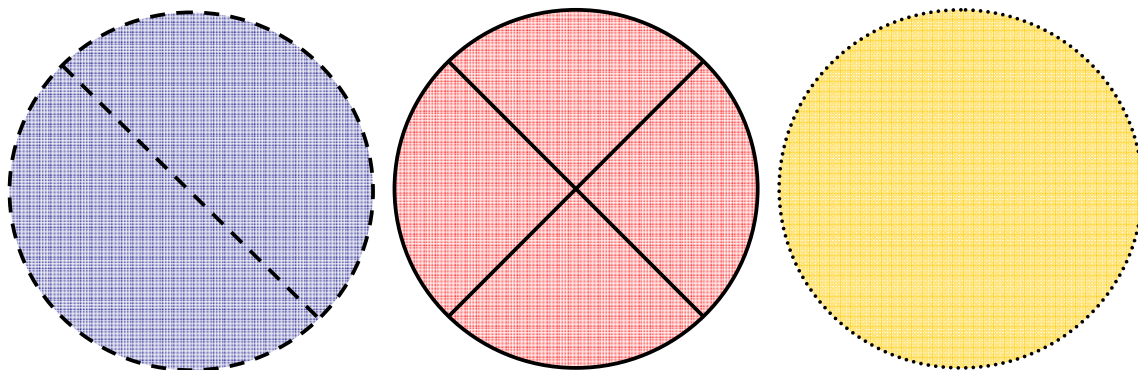
The measure is a sufficient criterion for individuation even when we can generate multiple partitions – *if the partitions have the same number of cells*.

- for example, there are many ways to divide a lump of cheese that weighs four kilograms into four pieces, each weighing one kilogram – and, since any such division would do equally well, we can arbitrarily choose one of them.

**Individuation by measure** obtains *only if the measure function involved in the basic denotation of the measure expression is monotonic relative to the part-whole structure of underlying domain of individuals*.

- if it is not, e.g. measuring the temperature of given amount of water is not monotonic relative to the part-whole structure of that amount of water, one cell in a partition could correspond to any number of cells in a different partition (while preserving material equivalence), e.g. we can materially partition the same amount of water in one, two or four cells.

Partitioning according to temperature a three liter amount of water, the temperature of which is 1°C



Individuation by measure enables us to account for the infelicity of pseudo-partitives with non-monotonic measures like the one in (7) above, repeated in (37) below for convenience.

37. #două grade de apă  
two.f degree.f.pl of water.f.sg  
#two degrees of water

Example (7/37) is infelicitous because:

- either the temperature of the water in the universe of discourse is not uniformly one degree and we cannot build any measure-based partition;
- or, if it so happens that the temperature of the whole water is uniformly one degree, we can build multiple, non-equi-numerous partitions (one of them will have only one cell containing all the water, another one will have two cells etc.) – and this violates individuation by measure.

#### Individuation by measure and indefinite measure expressions:

- at first glance, individuation by measure seems to incorrectly rule out pseudo-partitives with indefinite measure expressions like *a piece/bit of cheese*, since indefinite measure expressions could very well generate non-equi-numerous partitions;
- however, if indefinite measure expressions like *piece* receive an analysis that is parallel to the (basically) referential account of ordinary indefinites like *a man* etc. in dynamic semantics (Kamp 1981, Heim 1982, Groenendijk & Stokhof 1991 among many others), they will generate only equi-numerous partitions;
- for example, the indefinite measure expression *piece* is interpreted as *unit of some (arbitrary) size on the relevant scale* (weight, volume etc.), that is: on the relevant scale, (arbitrarily) fix a size; our measuring units will be scalar intervals of this particular size;
- hence, *a piece* is doubly indefinite, i.e. it is interpreted as *a unit of some size* – which, in the pseudo-partitive *a piece of cheese*, will polysemically shift the to the corresponding individual-based denotation just as any other "definite" measure expression (alternatively, we could interpret *a piece* as a plural indefinite of the form *some number of units-of-some-size*)

#### Further parallels between measure nominalizations and denominal verbs:

- the fact that we need the individuation by measure principle in addition to the definition of measure nominalizations to avoid overgeneration is parallel to the fact that we need other principles in

addition to the TELIC-based constraint of Generative Lexicon (GL; Pustejovsky 1995) theory to avoid overgeneration in the case of denominal verb formations;

- as Asher (2007): 76 observes, "it is often difficult to understand exactly what the values of the qualia are supposed to be. Is the telic role of a shelf, its purpose, really just to hold books? Presumably not. Shelves can hold all kinds of things – wine glasses, ski boots, outboard motors, clothes. So we should predict that sentences like [(38), (39) and (40) below] have a similar meaning to *John shelved the books*, but if [(38), (39) and (40)] make sense at all, they involve a shift to a metaphorical sense of *shelve* – something similar to *shelve an idea*."

38. John shelved his sweater.

39. Mary shelved her glasses.

40. Samantha shelved her chain saw.

### **Lexical blocking and pseudo-partitives with singular count nouns:**

Pseudo-partitives with singular count nouns in their N<sub>2</sub> position like (41) below are infelicitous – unless we run babies/pencils through Lewis's universal grinder (see Pelletier 1971).

41. #trei kilograme de copil/creion  
#three kilograms of baby/pencil

These constructions are infelicitous because:

- either there is at least one individual in the denotation of *baby/pencil* that does not weigh one kilogram (pragmatically very likely) and we cannot construct a measure-based partition;
- or, if each baby/pencil weighs one kg, there can be only one partition, the same as the part-whole structure of the count noun *baby/pencil* – the measure-based partition is therefore redundant and lexically blocked.

**Lexical blocking:** an expression formed by a relatively productive process is blocked by the availability of a more "lexicalized" alternative to that expression<sup>7</sup>.

- for example, *pale red* is lexically blocked by the availability of *pink*, despite the fact that *pale* can be combined with many other colors: *pale green*, *pale blue*, *pale yellow*; *pale red* is anomalous for certain speakers and, for others, it refers to non-pink shades of pale red (Householder 1971, apud Blutner 1998).

However, if we run babies / pencils through the universal grinder, we obtain a non-redundant measure-based partition, which is therefore not lexically blocked – hence the (gruesome) reading for the felicitous use of the pseudo-partitives in (41).

- similarly, a pseudo-partitive with a singular mass noun like *snow* in (42) below<sup>8</sup> is felicitous despite that fact that there is only one possible centimeter-based partition when we measure the depth of

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<sup>7</sup> For more discussion, see McCawley (1978), Atlas & Levinson (1981), Kiparsky (1982), Horn (1984), Levinson (1987), Clark (1990), Matsumoto (1995), Blutner (1998).

<sup>8</sup> I am indebted to Roger Schwarzschild for this example (p.c.).

fallen snow – this is because, unlike the *baby/pencil* example in (41) above, there is no independent lexically-encoded partition that blocks the measure-based individuation.

42. three centimeters of snow

- the same reasoning rules out pseudo-partitives with definite NP's like the one in (4) above, repeated below – their part-whole structure is like that of a count noun, except that there is only one individual in their denotation.

43. #zece grame **de** această brânză (de capră)  
ten grams of this cheese (of goat)  
ten grams of this goat cheese

- in contrast, the true partitive in (2), repeated below, is felicitous because the preposition *din* alters the part-whole structure of the nominal by (say) running the individual under discussion through the universal grinder and delivering a mass-like mereology (note that, in this case, the mereology alteration is lexically encoded by the preposition *din*).

44. zece grame **din** această brânză (de capră)  
ten grams of this cheese (of goat)  
ten grams of this goat cheese

#### More supporting evidence for measure-based poslysemy:

**Individual-to-degree meaning shifts<sup>9</sup>:** morphemes like *worth* and *-ful* trigger meaning shifts in the opposite direction, namely from individual-based denotations to degree-based denotations, as shown in (45), (46), (47) and (48) below.

45. ten dollars worth

46. (we had) two days worth of discussion (in one day)

47. a shedful of apples

48. a fistful of dollars

The existence of such morphemes brings further support to the hypothesis that there are systematic relationships between the space of degree-related meanings and the space of individual-based meanings.

**No monotonicity requirement in comparatives:** the present account of monotonicity in pseudo-partitives predicts that such a requirement occurs only when a degree-to-individual meaning shift is necessary (since monotonicity is a consequence of "individuation by measure").

We therefore correctly predict that there is no monotonicity requirement in comparatives, as shown by the felicitous sentence in (49) below – because measure expressions have their usual, degree-based denotations in such constructions.

49. The water was 3°C hotter than Linus expected it to be.

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<sup>9</sup> I am grateful to C. Kennedy (p.c.) for this point and for the examples in () and ().

### 3 COMPARISON WITH ALTERNATIVE APPROACHES

- I have compared the present approach with the one in Schwarzschild (2006) throughout this handout; in this section, I will only discuss the recent account in Tănase-Dogaru (2007);
- Tănase-Dogaru (2007) examines the whole range of pseudo-partitive  $N_1$  *de*  $N_2$  constructions in Romanian and reaches the conclusion that both nouns are lexical heads of the pseudo-partitive extended projection;
- $N_1$  is a semi-lexical head and  $N_2$  a lexical head;
- she maintains that  $N_1$  can also be a purely functional head, e.g. in (50) and (51) below (see Tănase-Dogaru 2007: 13, (36a) and (26a)), where the verbal inflection agrees with  $N_2$  and not  $N_1$ ;

50. Un număr de studenți mă așteptau pe hol.  
A number.sg of students.pl me expect.impf.pl on hallway.  
A number of students were waiting for me in the hallway.

51. O grămadă de cărți au fost citite pentru examen.  
A pile.sg of books.f.pl HAVE.pl been read.f.pl for exam  
A lot of books were read for the exam.

- according to her, pseudo-partitive constructions have only one syntactic structure – and it is the variation between the semi-lexical and functional status of the  $N_1$  head that accounts for the variation in agreement exhibited by pseudo-partitives and exemplified in (52)-(53) below ((25a, b) in Tănase-Dogaru 2007: 9).

52. Un grup de studenți au cerut învoire.  
A group of students have.pl asked leave.

53. Un grup de studenți a cerut învoire.  
A group of students have.sg asked leave.

The measure-based pseudo-partitive constructions examined here do not exhibit this agreement pattern – the agreement is always with the measure expression. This is one of the reasons for the more radical claim put forth here that  $N_1$  is the sole lexical head of such constructions.

However, the present proposal can be thought of as the semantic counterpart of Tănase-Dogaru's syntactic proposal that  $N_1$  common nouns are semi-lexical head:

- they are **lexical**-like items in the sense that they have the same kind of denotations as ordinary common nouns, i.e. a domain of individuals and a part-whole structure associated with it;
- they are **functional**-like items insofar as they have higher-order semantic values (like generalized determiners, tense/aspect morphology, modal auxiliaries etc.), i.e. they take a partly contextually-determined part-whole structure over a domain of individuals, i.e. a common noun denotation and restrict it in a measure-based way<sup>10</sup>.

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<sup>10</sup> As von Stechow (1995) observes, higher-order denotations are the hallmark of functional items in Montagovian semantics – this is the way in which we can formally capture the pre-theoretical observation that functional items are semantically "bleached", i.e. the lack "descriptive" semantic content.

Thus, I take nominalized measure expressions to have an extra *semantic* argument for the part-whole structure of the  $N_2$  nominal – but this does not mean that the semantic argument position is syntactically realized.

It might very well be an implicit argument like the temporal and / or eventuality argument of verbs – and the PP *de N<sub>2</sub>* can very well be an adjoined modifier that semantically targets this syntactically implicit argument, much like adjoined adverbial phrases target the temporal and / or eventuality arguments of verbs.

The present proposal is to a certain extent independent of the question whether pseudo-partitive constructions are associated with only one syntactic structure or with multiple structures.

But the observation that  $N_1$  nouns in pseudo-partitive constructions can undergo polysemic meaning shifts leaves open the possibility that the monotonic, pseudo-partitive uses of measures exemplified in (5) above (repeated in (54) below), and the non-monotonic uses of measures in (6) above (repeated in (55) below) have the same syntactic structure, schematically provided in (56) below, where  $N_1$  is the lexical head of the nominal extended projection and *de N<sub>2</sub>* is a PP, possibly an adjunct, modifying the lexical head<sup>11</sup>.

54. doi litri de apă  
two.m liter.m.pl of water.f.sg  
two liters of water

55. apă de două grade  
water.f.sg of two.f degree.f.pl  
two degree water

56. [<sub>DP</sub> D<sup>0</sup> [<sub>NP</sub>  $N_1$  [<sub>PP</sub> [<sub>P</sub>*de*]  $N_2$  ] ] ]

Finally, the  $N_1$  *de N<sub>2</sub>* constructions in (50), (51) and (52) above, where we see agreement with the  $N_2$  noun (and where the agreement with the  $N_1$  noun is not always possible!), might instantiate a different kind of syntactic structure, where  $N_2$  is the sole lexical head of the extended projection, while the remaining items have functional status. Tănase-Dogaru (2007) also countenances the existence of such syntactic structures.

Under this view, the Romanian noun *grup* (group) does not have the questionable status of "semi-lexical" head (no  $N_1$  noun does) and there is no need to posit exceptional extended projections with multiple lexical heads.

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<sup>11</sup> Romanian pseudo-partitive and true partitive constructions seem to be syntactically different from their English counterparts insofar as both kinds of constructions are compatible with the (left-)dislocation of the second nominal phrase, as shown in (i) and (ii) below. In contrast, (right-)dislocation of the second nominal phrase is possible in English only with true partitives, as shown in (iii) and (iv) below (the English examples are from Selkirk 1977).

(i) *Din acest vin*, George a băut *un litru*. (vs. George a băut *un litru din acest vin*.)  
*Of this wine*, George drank *one liter*. (vs. George drank *one liter of this wine*.)

(ii) [Cît vin și cîtă apă a băut George aseară?]  
[How much wine and how much water did George drink last night?]  
*Vin*, a băut *un litru*, iar *apă*, a băut *doi litri*. (vs. A băut *un litru de vin* și *doi litri de apă*.)  
*Wine*, he drank *one liter*, and *water*, he drank *two liters*. (vs. He drank *one liter of wine* and *two liters of water*.)

(iii) *A lot* has been eaten *of the leftover turkey*. (vs. *A lot of the leftover turkey* has been eaten.)

(iv) \**A lot* has been eaten *of leftover turkey*. (vs. *A lot of leftover turkey* has been eaten.)

Certain items – like the Romanian *grup* in the nominal domain and the English *have* and *be* in the verbal domain – are ambiguous between a lexical and a functional status: if *grup* has a lexical status, we obtain the agreement pattern in (53); if *grup* has a functional status, we obtain the agreement pattern in (52)<sup>12</sup>.

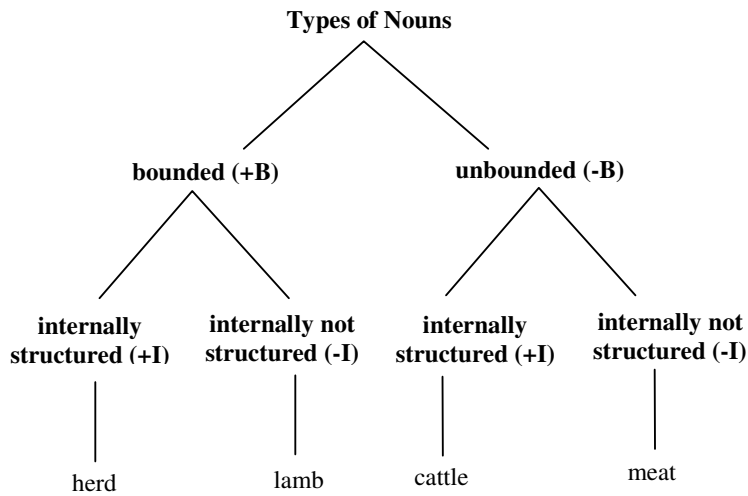
## APPENDIX

Romanian provides additional empirical support for the classification of noun types in (57) below, due to Jackendoff (1991) (see also Climent 2001): partitive constructions that are structurally identical in English and Spanish are distinct in Romanian – in particular, the semantic distinctions between various types of  $N_2$  nouns correspond to three different kind of constructions:

- *de* constructions:  $N_1$  *de*  $N_2$
- *din/dintre* constructions:  $N_1$  *din(tre)*  $N_2$
- genitive constructions:  $N_1$  (*a*)  $N_2$ .*Gen*

The table in (58) below classifies partitive constructions in English, Spanish and Romanian according to the type of the  $N_2$  noun. The English and Spanish examples are from Climent (2001).

### 57. Types of nouns (Jackendoff 1991)



### 58. Partitive constructions in English, Spanish and Romanian based on the type of the $N_2$ noun

BOUNDED (+B)						UNBOUNDED (-B)					
Internal Structure (+I)			No Internal Structure (-I)			Internal Structure (+I)			No Internal Structure (-I)		
Eng.	Sp.	Rom.	Eng.	Sp.	Rom.	Eng.	Sp.	Rom.	Eng.	Sp.	Rom.
one of the team	uno del equipo	unul din(#tre) echipă	the tip of the tongue	la punta de la lengua	vîrful limbii	a group of people	un grupo de gente	un grup de oameni	a bottle of wine	una botella de vino	o sticlă de vin
one of	alguno	unul	a part	una	o parte a	a row	una	un rînd	a basket	un cesto	un coș

<sup>12</sup> We can still explain the need for the preposition *de* in structures in which  $N_1$  is a functional head (there is no need for an explanation in the cases in which  $N_1$  is a lexical head – in all these cases, *de* is the lexical head of the PP containing  $N_2$ ). First, prepositions are famously ambiguous with respect their lexical vs. functional status; in all the cases in which  $N_1$  is a functional head, *de* is also a functional head, whose role is to "mediate" / resolve the clash in agreement features (number and gender) between the  $N_1$  functional head and the  $N_2$  lexical head. This is basically the analysis of *de* in Tănase-Dogaru (2007); see Grimshaw (2005) and references therein for the general theoretical background for this kind of proposal.

58. Partitive constructions in English, Spanish and Romanian based on the type of the  $N_2$  noun

BOUNDED (+B)						UNBOUNDED (-B)					
Internal Structure (+I)			No Internal Structure (-I)			Internal Structure (+I)			No Internal Structure (-I)		
Eng.	Sp.	Rom.	Eng.	Sp.	Rom.	Eng.	Sp.	Rom.	Eng.	Sp.	Rom.
the players	de los jugadores	din(tre) jucători	of the book	parte del libro	cărții / o parte din(#tre) carte	of houses	hilera de casas	de case	of oranges	de naranjas	de portocale
									a liter of wine	un litro de vino	un litru de vin
									a kilogram of oranges	un kilo de naranjas	un kilogram de portocale
									a bit of bread	un poco de pan	un pic de pâine
									a slice of bread	una rebanada de pan	o felie de pâine
									a grain of sand	un grano de arena	un grăunte de nisip
Romanian – <i>din/dintre</i> constructions: $N_1$ <i>din(tre)</i> $N_2$			Romanian – genitive constructions: $N_1$ (a) $N_2$ .Gen			Romanian – <i>de</i> constructions: $N_1$ <i>de</i> $N_2$					

**The difference between *din* and *dintre*:**

*Din* is compatible with any referential (bounded, in Jackendoff's terms) DP in the  $N_2$  position – it is blocked by the availability of the Genitive construction only in certain cases, e.g. inalienable possession – *vîrful limbii* (the tip of the tongue).

In particular, *din* is compatible with definites that contain a singular count noun like *limbă* (tongue) or a singular group noun like *echipă* (team).

In contrast, *dintre* is compatible only with plural nouns, although this is a necessary, not a sufficient condition, as shown by the example in (59) below (repeating (18) above)

59. doi    din / #dintre    cei    cinci litri    de apă  
 two.m    of    the.m.pl five    liter.m.pl of water.f.sg  
 two of the five liters of water

*Dintre* seems to require a distinct (non-measure-based) principle of individuation for the atomic individuals that are part of the denotation of the plural definite in the  $N_2$  position. For example, *doi dintre cei cinci litri de apă* is infelicitous if I point to a five liter container, but it is felicitous if I point to five bottles of water containing one liter of water each.

*Dintre* also seems to require a definite DP in the  $N_2$  position, as shown by (60) and (61) below.

60. L-am bătut la două jocuri din / #dintre cinci.  
 I defeated him in two games out of five.

61. Trei soldați din / #dintre zece sînt bolnavi.  
 Three soldiers in ten are sick.

Both these observations can be unified under the generalization: *dintre* is anaphoric to a domain of individuals and a part-whole structure already available in the discourse and / or utterance context – this



anaphoric requirement is not satisfied if the DP in the  $N_2$  position is an indefinite (as in (60) and (61) above) or if the DP in the  $N_2$  position is a definite pseudo-partitive (as in (59) above), which requires a polysemic meaning shift, hence it introduces a new (measure-based) part-whole structure.

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