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Number marking in German measure phrases and the structure of pseudo-partitives

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Abstract: This paper investigates the variation in the morphology and interpretation of pseudo-partitive constructions ("NUM-N_1-(*of*)-N_2") in the Central Bavarian dialect of Vienna, which shows a morphological distinction between ambiguous measure phrases such as *two glasses of water*: in the referential reading, which refers to two glasses, N_1 takes plural morphology, whereas it is morphologically inert in the quantity reading, which refers to an amount of water. While these two readings of measure phrases in pseudo-partitives are cross-linguistically well represented, they are not always morphologically differentiated. The distribution of number marking in Viennese has syntactic (possibility of fronting out of the pseudo-partitive), semantic (availability of the referential vs. the quantity reading, predicate selection), and prosodic consequences (presence vs. absence of word stress on N_1). I argue that this is because in the quantity reading, N_1 is a morphologically inert functional head μ which takes a numeral and a substance noun (N_2) as its arguments and counts the instances of N_2 for a given unit of measure, while in the referential reading, the pseudo-partitive consists of two NPs. The variation in number morphology seen in these constructions can be used as a diagnostic for the microvariation and the cartography of complex NPs in Germanic pseudo-partitives, as well as for languages which do not morphologically distinguish between the two readings, like English.

Keywords: Pseudo-partitives, measure phrases, number, container nouns, Viennese

1 Introduction

Languages vary in terms of how much functional structure their nouns are embedded in, especially in constructions involving more than one noun. The aim of this paper is to show how one particular dialect of Germanic, Viennese German, uses number morphology to distinguish between two different readings of numeral pseudo-partitives ("NUM-N_1-(*of*)-N_2", e.g., Engl. *three glasses of water*), the container reading (in which N_1 is referential) and the quantity reading (in which N_1 is non-referential). Specifically, I argue that Viennese shows that there are two different syntactic structures available for the two readings, and that number morphology on N_1 can be used as a diagnostic to determine whether or not a given language uses both structures. While English phrases such as *three glasses of water* are semantically ambiguous, the evidence for positing two separate *syntactic* structures is sparse. On the other hand, a comparative study of the microvariation in pseudo-partitives

in other Germanic languages shows that such separate structures must be in principle available and provides further arguments (and diagnostics) for positing separate structures in English as well.

The variation in number morphology on N_1 in Germanic pseudo-partitives at first glance seems puzzling and unpredictable and has so far received less attention in the literature. I argue that its distribution is actually tightly constrained both by general architectural considerations and the particular diachronic development of the Germanic languages. Pseudo-partitive constructions can exhibit extremely subtle variation even in closely related dialects or registers, and the problem of "gradience" in functional structure is therefore relevant to both macro- and microvariation in noun phrase structure. While English lacks clear morphosyntactic evidence for having separate structures associated with the two readings, a comparative perspective can give insights into the available structural cartography of pseudo-partitives and help delineate structural possibilities for potentially ambiguous constructions such as the English one.

Further evidence for structural ambiguity comes from the diachrony of these phrases. While the quantity and the container reading are superficially identical in English, this was not always the case. Considering the diachronic development as well as the synchrony of pseudo-partitives makes it possible to make predictions about where one expects to find structural variation and what kinds of grammaticalization paths are available to a given measure noun.

This paper is structured as follows. I first give a general introduction to the core properties of pseudo-partitive constructions in section 2, focussing on English and German and paying special attention to the morphosyntactic properties of container vs. standard unit measure nouns in Viennese German. In section 3 I present my own analysis of Viennese pseudo-partitives, arguing that at least two different structures must be assumed for them. In section 4, I return to the question of whether or not there is evidence for a structural ambiguity in English. In section 5 I discuss the diachronic development of pseudo-partitives and their grammaticalization path in German and English. Section 6 contains the conclusion and a summary of the properties of German and English pseudo-partitives. The Appendix contains additional data from English, Dutch, and Danish.

2 The properties of pseudo-partitives

Pseudo-partitives consist of two nominals, the first of which (N_1) measures a proportion of the second one (N_2) which is indefinite and non-referential ((1a) and (2a)). These constructions differ from partitive ones in that in the latter, N_2 is definite and N_1 picks out

a partition of a definite, previously established set ((1b) and (2b)). The following examples illustrate these constructions for English and German:

(1) English:

a.	three glasses of water	(pseudo-partitive)
b.	three glasses of this delicious wine	(partitive)

(2) German:

a.	zwei Gläser Wasser		(pseudo-partitive)
	two glasses water		
b.	zwei Gläser von diesem leckeren Wein		(partitive)
	two glasses of this delicious wine		

Partitives and pseudo-partitives come in different varieties depending on the properties of N_1 (see Koptjevskaja-Tamm 2001 for a classification and typological overview). They often pattern with quantificational or numeral constructions cross-linguistically.

The focus of this paper is on pseudo-partitive constructions in which N_1 is a measure noun (MN). These encompass both standard units of measure, like Engl. *kilo*, *pound*, *ounce*, etc., and non-standard units (often containers of some sort), like Engl. *heap*, *cup*, *glass*, etc. In particular, I will concentrate on the ambiguity that some container nouns exhibit with respect to referentiality, and how this ambiguity can be exploited to detect fine-grained structural distinctions between different types of pseudo-partitives. For example, the following English pseudo-partitive has two readings, one in which we are talking about a quantity of water that can by measured using two glasses ("quantity reading"), and one in which we are talking about two actual glasses that happen to be filled with water ("container reading").

(3) Two glasses of water

In the quantity reading, N_1 is non-referential, whereas in the container reading, N_1 is referential. This ambiguity of N_1 has long been noted, for English as well as other languages, and it has been argued that it reflects different underlying structures (e.g., Selkirk 1977, Borer 2005, Alexiadou et al. 2007, Hankamer and Mikkelsen 2008, Rothstein 2009, Stickney 2009, Scontras 2013, 2014). In English, however, the two readings seem to have the same surface morphological and syntactic properties. On the other hand, there are languages in which these two readings differ in their morphological, prosodic, and even syntactic behavior. One of these is Viennese German. I introduce the Viennese data in section 2.2 and argue that there is a difference in the status of the measure noun between (Viennese) German and English that has morphological, syntactic, and semantic

consequences. This also holds for comparable constructions in other Germanic languages, like Dutch and Danish (see the Appendix).

Languages vary to some extent with respect to the type of constructions they employ for pseudo-partitives. Two strategies will be relevant to this discussion: First, juxtaposition, in which the two nominals are combined in the pseudo-partitive without any special case marking on N_2 (e.g., German, (4)) and second, combining N_1 and N_2 through an intervening preposition or preposition-like element (e.g., English, (5)):

(4) zwei Gläser Wasser
two glasses water

(5) two glasses *of* water

The first option is usually referred to as "Direct Partitive Construction" (DPC) in the literature on pseudo-partitives in Germanic and is found in German, Dutch, and Danish (among others). The second option is called "Indirect Partitive Construction" (IPC) and is found in English, Dutch, Danish, etc. Languages often have more than one strategy, often in overlapping distribution.

A third option, related to the first one, is juxtaposing the two nominals, but marking N_2 with a special "partitive" or "separative" case. In Germanic languages that have this construction (e.g., some varieties of Modern High German; Old and Middle English), the case used is usually the genitive.

(6) Zwei Gläser süßen Weins (Standard German)
two glasses sweet.GEN wine.GEN

I do not discuss the partitive genitive in this paper since Viennese German and most of the other Germanic languages under discussion here do not have it. Detailed discussions of the partitive genitive in Modern High German can be found in, e.g., Bhatt 1990, Lindauer 1993, and Demske 2001.

In general, pseudo-partitive constructions differ along several parameters depending on the status of N_1, inlcuding the presence vs. absence of plural marking in the quantity reading, the possibility of extracting the substance noun or the measure noun plus the substance noun, word stress on N_1, predicate selection, and verbal agreement.

Since the facts for English are relatively well-known, I start with a brief review of English pseudo-partitives, followed by a comparison with German, in particular Viennese.

2.1 English

In addition to using the linker[1] *of* to join N_1 and N_2, N_1 always takes plural morphology with numerals higher than 'one' in English:

(7) a. two glass-**es** of water
b. two kilo-**s** of apples

Cases like (7a), in which N_1 is a container of some sort, have two readings: a quantity/unit reading in which N_1 is non-referential and designates a standard unit (of weight), and a container reading in which N_1 is referential. That is, only in the latter reading are we talking about actual glasses in (7a). In the quantity reading we are referring to more abstract entities that do not presuppose the existence of the actual glasses. There is, however, an entailment relation between these two readings: The container reading entails the quantity reading because the *container* "glass" in (7a) also measures a *quantity* (the quantity of water contained in the glass). The quantity reading, on the other hand, does not entail the container reading.

Selkirk (1977) already suggests that this difference correlates with a structural difference in pseudo-partitives, which according to her are sometimes headed by N_1 (container reading) and sometimes by N_2 (quantity reading, cf. Stickney 2009 and Stickney et al. 2013 for a similar analysis). Selkirk also notes that both pseudo-partitives and partitives are structurally ambiguous in that both N_1 and N_2 can determine verbal agreement and predicate selection. (8a) and (9a) (Selkirk's (93) and (98)) are examples of the quantity reading, in which N_2 descriptively heads the phrase and determines predicate selection and agreement. (8b) and (9b) (Selkirk's (94) and (98)) are instances of the container/referential reading, in which N_1 heads the phrase:

(8) a. A cup of sugar was strewn on the floor.
b. A cup of sugar smashed on the floor.

(9) a. A bunch of those flowers were thrown out on the back lawn.
b. A bunch of those flowers was thrown out on the back lawn.

[1]This use of *of* is also referred to as "postnominal genitive" because it shares many of the properties of (partitive) genitives in languages that have them (see Alexiadou et al. 2007: pt. III & IV for a general discussion). Since it is clearly not a preposition in these constructions, I use the more neutral term "linker" to refer to it (cf. the use of this term by Den Dikken and Singhapreecha 2004). For reasons of space, I cannot go into the proposal by Corver (1998), who analyzes *of* as nominal copula in predicative constructions, with predicate inversion of the measure noun and the substance noun. See Alexiadou et al. 2007: pt. III, ch. 2 for a discussion of this approach.

In English, topicalization of *of* + N_2 is ungrammatical (10a), as is topicalization of N_2 (10b)[2] and stranding the numeral (10c):

(10) a. * [Of carrots]$_i$ I bought two sacks t_i.
b. ?? Carrots$_i$ I bought two sacks of t_i.
c. * [Sacks of carrots]$_i$ I bought two t_i.

These facts suggest that the pseudo-partitive construction in English is structurally different from that in German, in which the equivalents of (10) are grammatical (or at least better, as in the case of (10c). We cannot simply posit that there is a functional head between N_1 and N_2 whose expression is *of* in English, but which remains unpronounced in German. It remains to be seen, however, whether the two languages also differ with respect to the structural position of N_1.

2.2 German

German pseudo-partitives differ from English ones in that they juxtapose N_1 and N_2 without using a "linker":

(11) ein Bund Rosen
a bunch roses

Standard German, contrary to English, does not have plural marking on most standard units of measure that relate to weight in transitive MP constructions[3]:

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[2]Concerning (10b), Kayne 2005: 137 reports that such cases are actually grammatical, e.g.:

(i) Money John has lots of.

Apparently this is only true with strong contrastive stress on the fronted noun, but speakers seem to vary in whether or not they fully accept it.

[3]In the following, I use "transitive nouns" to refer to nouns with a nominal complement (independent of its case) and "intransitive nouns" to refer to nouns without a complement, as in (i) below.
Neither Standard nor Viennese German has plural marking on standard units in either their transitive or their intransitive use. However, some German dialects allow plural marking in the intransitive use, e.g.:

(i) Das sind genau zwei Kilo-s.
This are exactly two kilo-$_{PL}$
'These are exactly two kilos.'

This is not the case in Viennese, where *Kilos* is never used. Note that unlike the "invariant" nouns of table 2 (see the main text below), the phonological structure of *Kilo* would make

(12) a. zwei Kilo(*-s) Äpfel
two kilo-PL apples
b. zwei Gramm(*-e) Zucker
two gram-PL sugar

However, non-standard units of measure, e.g., container nouns like *Sack* ‘sack’, *Korb* ‘basket’, *Flasche* ‘bottle’, etc., always require plural marking with numerals higher than ‘one’:

(13) a. drei Flasche*(-n) Wasser
three bottle-PL water
b. zwei *Korb/Körbe Äpfel
two basket/baskets apples

The grammatical versions of (13) (i.e., the ones with plural morphology) are ambiguous between the quantity and the container reading, just like English (7a).

Viennese German differs from this situation in that it morphologically distinguishes between the quantity reading and the container reading,[4] that is, for certain container nouns, both versions of (13) are grammatical. Plural morphology on the measure noun is found in the container reading (14b), while the quantity reading does not have a plural marker (14a):

(14) a. zwei Glas Wasser
two glass.SG water
‘two glasses of water’ (quantity)
b. zwei Gläs-**er** Wasser
two glass-PL water
‘two glasses of water’ (container)

That we are dealing with two different readings is confirmed by contrasts in predicate selection:

(15) a. ?* Zwei Glas Wasser sind runtergefallen und zerbrochen.
two glass.SG water are fallen.down and broken

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one expect overt plural marking, as in, e.g., *Auto* ‘car’—*Autos* ‘cars’. In other words, the lack of plural morphology cannot be accidental or purely phonologically motivated.

[4]The dialect under discussion here is contemporary colloquial Viennese German, which is phonologically close to Standard Austrian German, but not the same as “classical” Viennese (“Schönbrunnerdeutsch“). Of the 15 speakers I consulted (the majority non-linguists), two are from Upper Austria but have lived in Vienna for over ten years. Both accept the plural-marked and the inert forms in the readings discussed above in both dialectal registers. In fact, the generalizations pertaining to plural marking in general seem to hold for speakers of the closely related dialects of Upper and Lower Austria, but a closer study of these dialects was beyond the scope of this paper.

b. Zwei Gläs-er Wasser sind runtergefallen und zerbrochen.
two glass-PL water are fallen.down and broken
'Two glasses of water fell off and smashed.'

Because of the entailment relations between the two readings, predicates relating to the quantity rather than the container are usually better with plural marking, (16b), than predicates relating to the container reading are without it (as in (15a)). In other words, while the quantity reading is usually available for plural-marked container nouns, the opposite does not hold. Although a plural-marked container allows the quantity reading, (16b), the unmarked strategy for the quantity reading is singular on N_1, (16a).[5]

(16) a. Ich hab noch zwei Glas Wasser in die Suppe gebm.
I have also two glass.SG water into the soup given
b. ? Ich hab noch zwei Gläser Wasser in die Suppe gebm.
I have also two glasses.PL water into the soup given
'I also added two glasses of water to the soup.'

Comparing standard unit and container MPs, Viennese German measure nouns can be divided into two groups, those that have overt plural marking and those that do not. Examples are given in the following tables, which are not meant to be exhaustive (bracketed items indicate standard units of measure that are not in use in Austria):

Table 1. Measure NPs with plural marking

Standard unit			Container		
Sg.	Pl.		Sg.	Pl.	
(Gallone	Gallone-n	'gallon(s)')	Glas	Gläs-er	'glass(es)'
Tonne	Tonne-n	'ton(s)'	Tonne	Tonne-n	'barrel(s)'
			Korb	Körb(-e)	'basket(s)'
			Schüssel	Schüssel-n	'bowl(s)'
			Tasse	Tasse-n	'cup(s)'
			Sack	Säck(-e)	'sack(s)'

[5]It is possible to coerce a quantity reading for the plural measure nouns using fractions, in which case the resulting clauses become noticeably degraded:

(i) a. ?? Eineinhalb Gläs-er Wasser sind zerbrochen.
1 1/2 glass-PL water are broken
'One and a half glasses of water got broken.'
b. ?? Ich hab gestern eineinhalb Gläser Wasser getrunken
I have yesterday 1 1/2 glass-PL water drunk
'Yesterday I drank one and a half glasses of water.'

Table 2. Measure NPs without plural marking

Standard unit			Container		
Sg.	Pl.		Sg.	Pl.	
Kilo	Kilo	'kilo(s)'	Kübel	Kübel[6]	'bucket(s)'
(Pfund	Pfund	'pound(s)')	Becher	Becher	'cup(s)'
Gramm	Gramm	'gram(s)'	Teller	Teller	'plate(s)'
Deka	Deka	'dekagrams'	Häferl	Häferl	'mug(s)'
Liter	Liter	'liter(s)'	Packerl	Packerl	'pack(s)'

A first interesting observation here is that measure nouns that relate to a standard unit of weight (*Kilo*, etc.) tend not to have overt plural marking (table 2), whereas container nouns with overt plural marking are much easier to find (table 1). Invariant singular/plural forms are in fact well established for the standard units of measure of table 2., i.e., *Kilo* (sg./pl.), *Gramm* (sg./pl.), etc., both in Standard and in Viennese German. The two varieties differ, however, in the extent to which they allow container nouns to lose their plural morphology. Viennese German allows a number of container nouns to use singular forms for the quantity

[6]As one reviewer has pointed out, some speakers use the *n*-plural with container nouns in *-erl* (diminutives) and *-el* (*Packerl-n* 'packs', *Kübel-n* 'buckets', *Häferl-n* 'mugs', etc.). This is a relatively recent development; the *n*-plural is originally restricted to feminine nouns in *-(e)l*, while masculine and neuters stems in *-(e)l* (like the ones in table 2) have invariant plural forms (Duden 4: 183f.). The speakers I consulted rarely use the *n*-plural with these nouns, and if they do, they are more likely to use it intransitive constructions, (i), than in transitive constructions, (ii), making it similar to the occasional plural form *Kilos* (cf. footnote 3):

(i) Ich hab die Kübel-n da ausgeleert.
I have the bucket-PL there emptied
'I emptied those buckets.'

(ii) Ich hab die Kübel(??-n) Wasser da ausgeleert.
I have the bucket(-PL) water there emptied
'I emptied those buckets of water.'

It should be noted that the generalization "plural marking only in the container/referential reading" would not be weakened by speaker-specific variation in the lexical items that allow plural morphology at all.

reading.[7] This holds for, e.g., *Sack* 'sack', *Korb* 'basket', and *Glas* 'glass',[8] but not for any of the nouns that take the *n*-plural[9] (*Tonne* 'ton/barrel', *Flasche* 'bottle', *Tasse* 'cup', etc.), which have both readings with numerals higher than one, (17a), exactly like English (7a). Container nouns which cannot be overtly plural marked likewise have both readings, (17b):

(17) a. zwei Flasch(e)-n Wasser
two bottle-PL water
'two bottles of water' (quantity/container)
b. zwei Kübel Wasser
two bucket.SG/PL water
'two buckets of water' (quantity/container)

Like in English, these phrases can trigger either singular or plural agreement on the verb when combined with the indefinite article and a plural count noun:

(18) a. Ein Haufen Bohnen wird jedes Jahr weggeworfen.
a heap.SG/PL beans.PL is every year thrown.away
b. Ein Haufen Bohnen werden jedes Jahr weggeworfen.
a heap.SG/PL beans.PL are every year thrown.away
'A heap/lot of beans get/gets thrown away every year.'

The difference in plural marking on the verb again corresponds to two different interpretations: N_1 in (18a) is referential (we are talking about the entity "heap"), whereas (18b) has a quantity reading (we are talking about the beans). This again has consequences

[7]While Standard German occasionally allows this for container nouns, too (e.g., for *Glas*), I have found that Viennese is much more permissive and provides more lexical items that can drop their plural morphology in the quantity reading. I have therefore decided to focus on this particular dialect, though it should be kept in mind that the dialectal difference is gradient. Which items conform to this pattern also depends to some extent on the individual speakers.

[8]Zifonun et al. (1997: 1980) furthermore adduce *Fass* 'barrel' (container), *Krug* 'jug, pitcher', *Barrel* 'barrel' (unit), *Kasten* 'box, chest', and *Schoppen* 'half pint' for Standard German, but only the first two are also commonly used in Viennese German.

[9]Although there are few standard units measuring weight that use the *n*-plural (*Tonne-n, Gallone-n*), there are many more for other dimensions, such as time (*Minute-n* 'minutes', *Sekunde-n* 'seconds', *Stunde-n* 'hours'), and length (*Meile-n* 'miles', *Länge-n* 'lengths; laps'), etc., which can never lose the plural ending. I will not discuss these extensively in this paper (but see Section 3.4.1.). Note that they only have a standard unit reading and rarely occur in transitive constructions (exceptions include, e.g., *zwei Tage Urlaub* 'two days of vacation', *fünf Minuten Stille* 'five minutes of silence', etc.). Measure nouns like *Scheibe* "slice", *Stück* "piece", *Prise* "pinch", etc., which are inherently relational, are given less space than in other discussions of pseudo-partitives because they do not easily distinguish between a referential and quantificational reading (that is, a slice must always be a slice *of* something and is thus not easily referential by itself). The core of relevant nouns is therefore reduced to those that clearly distinguish between a referential and a quantificational reading *and* have distinct singular and plural forms. Although these criteria strongly reduce the relevant data, I believe that they also make them more insightful.

for the kinds of predicates these phrases can select. In (19), the predicate *zerbrechen* 'break' requires the container reading, hence N_1 must be the head of the phrase controlling verbal agreement. In (20), *schütten* 'pour' combines with the quantity reading (i.e., we are referring to the amount of water held by two glasses, not the glasses themselves), hence the plural-marked version of (20), which triggers the container reading, is odd.

(19) Eine Tasse Nüsse ist/*sind runtergefallen und zerbrochen.
one cup.SG nuts is/are fallen.down and smashed
'One cup of nuts fell down and smashed.'

(20) Ich hab zwei Glas/??Gläser Wasser in die Suppe geschüttet.
I have two glass.SG/glasses.PL water into the soup poured
'I poured two glasses of water into the soup.'

Previous approaches to pseudo-partitives basically fall into two categories: Those that assume a full NP structure for the measure noun in pseudo-partitives (e.g., Corver 1998, Borer 2005, Schwarzschild 2006) and those that treat pseudo-partitives as "monophrasal" and assume that only N_2 heads an NP (e.g., Hankamer and Mikkelsen 2008, Stickney 2009). Both approaches usually acknowledge that languages may have more than one structure, or that some constructions may be ambiguous between two different structures (e.g., Selkirk 1977).

In the following, I take the Viennese German data as a starting point to show how the difference in number marking between the quantity and the container reading can be used to decide between a monophrasal and a biphrasal analysis, in which the first option corresponds to the quantity reading and the second option to the container reading.

3 Explaining Viennese German pseudo-partitives

3.1. Mono- vs. biphrasal pseudopartitives

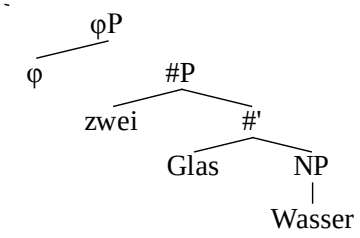
The basic paradigm that now needs to be explained is the distinction between the quantity and the container reading in Viennese pseudo-partitives in which N_1 is a container noun:

(21) a. zwei Glas Wasser
two glass.SG water
'Two glasses of water' (quantity)
b. zwei Gläs-er Wasser
two glass-PL water
'Two glasses of water' (container)

The central claim of my proposal is that Viennese has two separate syntactic structures for pseudo-partitives, each one corresponding to one of the two readings. In the quantity

reading in (21a), *Glas* is the head of a functional category #P (NumP) that measures a portion of the substance noun (N_2). Both N_1 and N_2 are non-referential. Semantic number is licensed on a functional head φ above #P. This structure is monophrasal, since there is only one NP (and only one number-valuing head φ):

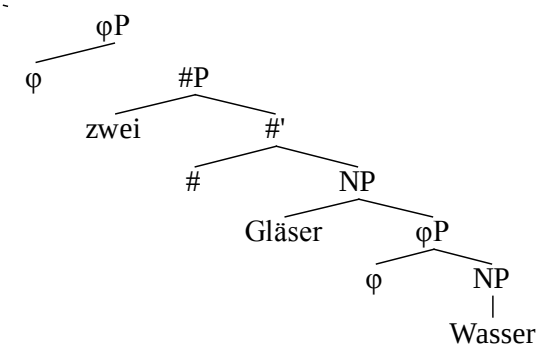
(22)



That measure nominals denoting standard units are functional elements has been proposed before, although the literature differs on whether or not they should be analyzed as phrasal (e.g., Löbel 1989, van Riemdsijk 1998, Vos 1999, Hankamer and Mikkelsen 2008, Stickney 2009, etc.). In the following, I argue that the lack of plural marking in Viennese measure nominals with a quantity reading, along with other diagnostics, can be accounted for in an analysis that treats these nominals as functional heads that do not syntactically agree for number.

In (21b), on the other hand, *Gläser* heads a normal NP that selects another NP as its complement, and only N_1 is referential. The plural marking properties follow from the fact that both NPs have number features that individually agree with a higher head φ. This structure is biphrasal, it contains two NPs (and two instances of number valuation):

(23)



I elaborate on these two structures in the following sections, starting with the quantity reading.

3.2 Quantity reading: N_2-headed pseudo-partitives

In the quantity reading, the measure noun *Glas* is the head of the functional category #P

(NumP), while the numeral in its specifier counts the instances of the substance noun with respect to the unit of measure specified by the measure noun. This analysis is similar to that of Löbel (1989), who argues that measure nouns such as German *Stück* 'piece' and *Pfund* 'pound' are heading a Quantifier Phrase (QP) that takes an NP complement. However, Löbel does not distinguish between the quantity and the container reading and does not address the problem of the variation in plural marking on the measure noun (see Bhatt 1990 for further criticism of Löbel's analysis).

Before going into the details of the analysis, it is necessary to discuss some of the background assumptions concerning the locus of number agreement. I essentially follow Sauerland (2003), who argues that the interpretable number features of nouns are determined by a functional projection φP that takes a DP-complement. That is, contrary to what is usually assumed, nouns do not enter the derivation with interpretable number features, but aquire them through syntactic agreement with a higher φP (as do determiners and adjectives). Verbal agreement takes place between T and the φP in its specifier, transferring the number valuation of the subject onto the verb.

Sauerland distinguishes between the *semantic* licensing of number on φ and the *syntactic* valuation of an uninterpretable number feature on D, N, and A. While number on φ is presuppositional, number morphology on D, N, and A requires syntactic agreement with a higher φ-head and valuation of their uninterpretable number features via Agree. In other words, while abstract Number is licensed semantically, its morphological exponence on, e.g., adjectives and determiners must be valued syntactically.

The φ-head comes in two flavors, SG and PL. Sauerland argues that SG contains the presupposition that its sister is an atom (or mass), whereas PL contains no presupposition. In other words, plural is the semantically unmarked member of this pair (see also Sauerland et al. 2005). This approach builds on Heim (1991)'s "Maximize presupposition" principle: when two lexical items are in competition, the one with the stronger presupposition must be used in cases where both their presuppositions are satisfied. Heim discusses this in connection with the distribution of the indefinite vs. the definite article: use of the indefinite article is illicit when the presupposition of the definite article is already satisfied. This is most clearly seen in cases where world knowledge suggests that an entity is unqiue, as in Heim's example *the weight of our tent* (1991: 514f.). Because a tent cannot have more than one weight, the presupposition of the definite article is always already satisfied and the indefinite article is never allowed. Applied to number morphology, this semantic-pragmatic principle means that PL will only occur when the stronger presupposition of SG cannot be satisfied (a kind of semantic "Elsewhere Condition"), or, conversely, that singular must

occur when an entity never has countable atoms (as in the case of mass nouns).[10] Hence number on φ is semantically licensed and depends on whether or not its sister can fulfil the stronger presupposition. Syntactic agreement then takes place between φ and a lower D, N, and/or A.[11]

Following Scontras 2013, I assume that in pseudo-partitives φP takes an NP rather than DP complement. The sister of φ, the licenser of its semantic number feature, is usually the head of #P, which measures the atomicity of the complement NP. In Viennese quantity-reading pseudo-partitives, the #-head itself is occupied by a measure noun μ, which defines the dimension that is measured by the numeral. The abstract structure of such a pseudo-partitive is the following:

(24) $[_{\varphi P}\ [_{\#P}\ \mu\ [_{NP}\ N\ ]\ ]\ ]$

While φP establishes whether its sister contains (sets of) individuals, #P (NumP), on the other hand, assigns cardinalities to individuals. #P is usually assumed to be between DP and NP (e.g., Ritter 1992, Alexiadou et al. 2007). Numerals are hosted in its specifier. In pseudo-partitives in the quantity reading, # is occupied by a measure noun μ (*Kilo*$_{\mu}$, *Glas*$_{\mu}$, etc.) whose task it is to quantify over partitions of a substance. Since μ is essentially quantificational, it has to select a compliment closed under sum formation (a kind or property). This means that μ must select either a bare mass noun or a plural count noun as its complement.

In the quantity reading, the numeral must be an argument of μ, since it is not possible to refer to an undefined amount of partitions over the substance. The semantics of intransitive MP in the quantity reading are therefore as follows[12]:

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[10]Note that my proposal does not depend on a particular definition of SG and PL, only on the claim that SG is presuppositional and that number is licensed high in the noun phrase. Rather than reviewing the debate on the semantics of number (especially PL), I therefore assume Scontras (2013)'s definition of SG: $[[SG]] = \lambda P: \forall x \in P\ [\ \mu(x) = 1\ ].\ P$, where SG contains the presupposition of composing with a property whose cardinality = 1.

[11]This approach to number morphology requires syntactic Upward Agree ("Reverse Agree") between φP and a lower D, A, or N with an unvalued number feature once this feature has been semantically licensed on φ, i.e.:

(i) φP[iF] … D[~~uF~~] … A[~~uF~~] … N[~~uF~~]

Reverse Agree has recently been argued for by Baker 2008, Bjorkman 2011, Wurmbrand 2012, Zeijlstra 2012, among others (note the parallels between (i) and the Multiple Agree examples of Zeijlstra 2012).

[12]Intransitive MPs can also select PP complements, resulting in (pseudo-partitive or partitive) IPCs. Viennese partitives in which N_1 is morphologically inert and which have the quantity reading, such as (i), are predicted to have the structure (ii):

(i) Zwei Glas von dem grauslichen Wein

(25) *Zwei Glas* (intransitive, quantity reading): $\lambda n \lambda x[\mu_{Glas}(x) = n](2)$

Measure nouns are here defined as functions that seek out numerals (thus also Scontras 2014: 75f.). In transitive pseudo-partitives, the measure nominal μ furthermore takes a kind-denoting complement (cf. Vos 1999: 149) and fixes a contextually salient partition of this complement (as per Chierchia 2010), which is either a mass noun or a plural count noun:

(26) *zwei Glas Wasser* (transitive, quantity reading):
a. [[zwei Glas Wasser]]: $\lambda k \lambda n \lambda x[^{\cup}k(x) \wedge \mu_{Glas}(x) = n](\text{Wasser})(2)$
b. $\lambda n \lambda x[^{\cup}\text{Wasser}(x) \wedge \mu_{Glas}(x) = n](2)$
c. $\lambda x[^{\cup}\text{Wasser}(x) \wedge \mu_{Glas}(x) = 2]$

When the substance noun is merged with μ, the variable n ensures that the measurement relation between *Glas* and *Wasser* is specified (that is, n counts instances of N_2 measured by N_1). Failure to merge a numeral results in ungrammaticality (the numeral is an argument of the measure nominal and must be specified):

(27) * Ich hab Glas Wasser in die Suppe geschüttet.
I have glass water into the soup poured
Intended: 'I poured (an unspecified amount of) glasses of water into the soup.'

To see how this works in detail, consider the derivation of a quantity-reading pseudo-partitive like (28).

(28) a. zwei Glas Wasser
two glass.SG water
'Two glasses of water' (quantity)

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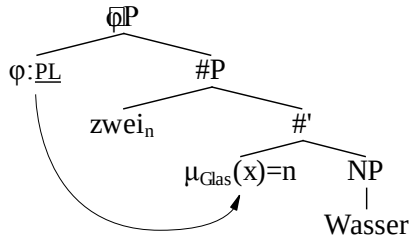
two glass.SG of the disgusting wine
(ii) [#P *zwei* μ*Glas* [PP *von* [DP *dem* [NP *grauslichen* N*Wein*]]]]

In partitives in which N_1 has the container reading, such as iii., the PP is selected by a higher NP:

(iii) Zwei Gläs-er von dem grauslichen Wein
two glass-PL of the disgusting wine
(iv) [#P *zwei* [NP *Gläser* [PP *von* [DP *dem* [NP *grauslichen* N*Wein*]]]]]

b.



The number feature of φ is licensed by the measure nominal in #, which in turn receives its range from the cardinal (note that only the semantic licensing of the number feature φ is indicated in (28b) by the dotted arrow, not the subsequent syntactic valuation via Agree). That is, when φ is merged its closest sister # does not contain an atom or mass (because μ(x) > 1) and SG's presupposition cannot be satisfied, hence the phrase emerges marked as PL. Note that even though the denotation of φ is PL, we do not see morphological number agreement on μ (i.e., we get *Glas* instead of *Gläser*) because the measure noun *Glas*$_\mu$ (like *Kilo*$_\mu$) itself does not agree for number (only A, N, and D agree for number in the (German) nominal phrase).[13] Under this view, the lack of plural marking on N_1 in the quantity reading is expected because N_1 in these constructions is not in a structural position where it can receive number morphology and is presumably not specified for number. German is crucially different from English in this regard, where we do see plural morphology on the measure noun in pseudo-partitives with this reading. I argue in section 4. that this is because the measure noun occupies a structural position in English that is different from that in German because it belongs to a syntactic category that bears a number feature and therefore shows morphological agreement with φ.

It is worth stressing that valuation of number works exactly the same way if N_2 is a plural count noun. That is, all that is relevant for φ is its closest sister, and once this is occupied by a measure noun μ(x) = n, where n > 1, PL is selected. This also explains why a coerced mass reading is (marginally) possible for singular count nouns in N_2:

(29) zwei Kilo Apfel
two kilo apple.SG
'two kilos of mushed apple/pieces of apple'

The measure nominal always selects kinds as its complement and is able to coerce a kind

[13]Pre-theoretically, this makes sense if one thinks of standard units of measure as abstract entities that do not refer to things that can be counted or quantified, but are used to count and quantify with, especially in transitive numeral constructions. In other words, *Glas* in *zwei Glas Wasser* does not inflect for number for much the same reason that *weight* in *the weight of our tent* does not (cf. p.13 above).

reading in cases where this would otherwise not be expected, as in (29).[14]

A further consequence of this structure is that it predicts that number agreement in numeral constructions in a language like German will always be determined by the denotation of the numeral, independent of the number marking on the substance noun. This seems to be true for numerals higher than one, both for transitive and intransitive uses of measure nouns in the quantity reading:

(30) a. Das sind/*ist genau zwei Kilo.
*This.SG are/*is exactly two kilo.SG*
'These/this are/is exactly two kilos.'
b. Drei Sack Erdäpfel kostn/*kostet fünf Euro.
*three sack.SG potatoes cost/*costs five euro.SG*
'Three sacks of potatoes cost five euros.'
c. Zwei Glas Wein sind/??ist genug.
two glass.SG wine are/??is enough
'Two glasses of wine are enough.'
d. Zwei Kilo Äpfel reichen/??reicht.
two kilo.SG apples suffice/??suffices
'Two kilos of apples are enough.'

There is actually a certain amount of speaker variation for c.-d., in which singular is acceptable for some speakers. The following example from Eschenbach 1994 (cited from Vos 1999: 64) can be added:

(31) Drei Kannen Tee reicht aus.
three jugs tea is.sufficient PRT
'Three jugs of tea are sufficient.'

Under my analysis, the singular agreement on the verb in (30c-d) and (31) is unexpected. Note, however, that plural is preferred in each case, and it seems that singular is tied to a "collective" reading that also allows the entire pseudo-partitive phrase to be referred to anaphorically with the neuter singular demonstrative pronoun *das*, irrespective of the number and gender morphology on N_1 (or N_2, for that matter):

(32) A: Glaubst zwei Flaschen.$_{F.PL}$ Wein$_{M.SG}$ reicht?
Think.2SG.PRES two bottles wine suffice.SG
'Do you think two bottles of wine are enough?'
B: Sicher, das$_{N.SG}$ reicht/*die$_{F.PL}$ reichen/*der $_{M.SG}$ reicht.
*Sure, that suffices/*these suffice/*that suffices*
'Sure, that's enough.'

[14]Compare the "universal grinder" coercion discussed in Wiese and Maling (2005) and Chierchia (2010).

That is, it is not clear that (30c-d) and (31) are indeed cases in which verbal agreement with N_2 takes place. They rather seem to be similar to cases in which singular agreement with a conjunction is possible, as in the following example (from Sauerland 2003):

(33) Strawberries and cream is on the menu.

Sauerland argues that this is possible "when the denotation of the conjunction can be viewed as an atomic individual". The singular neuter pronoun in (32) confirms that this is how the measure phrase is interpreted in that example. I conclude that cases like (30c-d) and (31) are not evidence for singular verbal agreement with N_2 with numerals > 1.

Since N_1 is a functional category in quantity reading pseudo-partitives, we also predict the lack of word stress in the pluralless quantity reading. In pseudo-partitives in which the measure noun is a standard unit and inflectionally inert, the word stress on N_1 is reduced, (34b), whereas in the container reading N_1 bears both word stress and plural morphology, (34a).

(34) a. zwei ˈGläs-er ˈWasser
two *glass-PL* *water*
b. zwei ˌGlas ˈWasser
two *glass.SG* *water*

Hankamer and Mikkelsen 2008 argue based on similar facts in Danish that this supports the idea that N_1 in the Danish DPC is the head of a functional category, since these are often prosodically weak (cf. Selkirk 1996).

Finally, the quantity reading structure (28) explains the difference in grammaticality between fronting of N_1 + N_2 in the quantity reading (35b) as opposed to fronting only N_2 (35a). In (35a), there is no intervening DP (or NP) between N_2 and the target position that could intervene, and N_2 is phrasal, so fronting is possible. In (35b), on the other hand, a non-phrasal constituent (the head of #P) is fronted to an A'-position, which is illicit.

(35) a. Karotten$_i$ hab ich zwei Sack t_i kauft
carrots *have* *I* *two* *sack.SG* *bought*
b. ? [Sack Karotten]$_i$ hab ich zwei t_i kauft
sack.SG *carrots* *have* *I* *two* *bought*

To sum up, the structure proposed for the quantity reading pseudo-partitives of the type *Zwei Glas Wasser*, with N_1 the head of a functional category #P, explains the following properties of this reading: The lack of plural morphology on N_1, the lack of word stress on N_1, and the possibility of fronting N_2 while fronting both N_1 and N_2 is less acceptable.

As one reviewer points out, this analysis of *Glas* and *Kilo* as quantificational, number-seeking category is at least at first glance at odds with the fact that measure nouns in the quantity reading can themselves be quantified (i.e., they behave like regular NPs), as in (36a). However, quantificational modification is only possible with a small set of quantifiers, and crucially not with ones that require individuals, (36b) (see Chierchia 1998, Scontras 2014). This contrasts starkly with the plural-marked container readings which allow such quantifiers, (36c), indicating that these are both syntactically and semantically "normal" (crucially countable) noun phrases.

(36) a. Die Gäste haben einige/viele/ein paar Glas Wein getrunken/Kilo Erdäpfel gekauft.
The guests have several/many/a few glass wine drunk/kilo potatoes bought
'The guests drank several/many/a few glasses of wine/bought several/many/a few kilos of potatoes.'

b. Die Gäste haben ??die meisten/*alle/*keine Glas Wein getrunken/Kilo Erdäpfeln gekauft.
*The guests have ??the most/*all/*no glass wine drunk/kilo potatoes bought*
'The guests drank ??most/*all/*no glasses of wine/bought ??most/*all/*no kilos of potatoes.'

c. Die Gäste haben die meisten/alle/keine Gläser Wein zerbrochen.
The guests have the most/all/no glasses wine broken
'The guests broke most/all/no glasses of wine.'

Moreover, measure terms like *Kilo*, *Glas*, and *Liter* cannot be modified by adjectives. In the following example (from Scontras 2014: 55), the unmarked reading is that the wine is beautiful, not the standard unit *liters*.

(37) I bought two beautiful liters of wine.

The observation that N_1 in the quantity reading is transparent for adjectival modification of N_2 has been used to argue that N_1 is a different syntactic category than N_2, and crucially not an NP.[15] While the adjectival modification facts in English and German pseudo-partitives are less than clear-cut (see the discussion in Section 4 below), I submit that the contrast between (37) and (38) calls for at least a semantic differentiation between measure nouns in the quantity reading and in the container reading.

(38) I bought two beautiful bottles of wine.

[15]On the "transparency effect" in pseudo-partitives, see Stickney 2009, Stickney et al. 2013, and the discussion below, especially footnote 24.

While in (37), it is the wine that is beautiful, the most natural reading of (38) is that the bottles are beautiful (but see footnote 24 for some important qualifications of this observation). While this difference itself does not immediately entail a syntactic difference as well, I have argued that it is precisely the failure of measure terms like *Kilo*, *Glas*, *Sack*, *Liter*, etc., to agree for number in the quantity reading that reveals their different syntactic status (at least in German). In other words, the measure (as opposed to container) semantics are linked to a difference in the syntax (and syntactic category) of N_1, and this is made explicit in the lack of number morphology. That quantity/"standard unit" semantics lead to morphological inertia on measure nouns has cross-linguistic parallels (cf. the Appendix) and can be traced throughout the diachrony of these languages (see Section 5 below). That these measure nouns, despite not being NPs, can be modified by certain quantifiers is expected given the status of the numeral in the quantity vs. the container reading: n is an argument of μ in the quantity reading that specifies the value of a particular unit of measure,[16] while it is a cardinal in the container reading (see Section 3.3 below). While we have so far operated under the assumption that this value = n, it would be unproblematic to modify (25) and (26) so that this value can be satisfied by quantifiers, as long as these do not require individuals as arguments.

3.3 Container readings: N_1-headed pseudo-partitives

Unlike standard units, container nouns head NPs and have overt plural morphology. This means we need to assume two φPs to account for the independent number marking on both the measure and the substance noun. The container MN is not the head of #P, but its complement. If this container is construed with a numeral, # is occupied by a cardinality operator CARD rather than by a measure noun μ as in the quantity reading. CARD produces a relation between numbers and individuals and ensures that any cardinal > 1 composes with a semantically plural complement.[17] I assume the definition of CARD as given by Scontras 2013:

(39) $[[\text{CARD}]] = \lambda P \lambda n \lambda x.\ P(x) \wedge |x| = n$ (Scontras 2013)

In other words, in the presence of a numeral, CARD mediates the relationship between φP and NP in a container reading pseudo-partitive. Note that this is different from the standard unit reading, where this relationship is mediated by μ taking the numeral as an argument.

[16]"In *three liters of water*, the numeral three does not count individuals. Instead, the numeral specifies the requisite value of the relevant measure, μ_{li} …" (Scontras 2014: 77).
[17]Sc. "in a language like English or German".

In the container reading, number on φ is licensed independently for both N_1 and N_2. As for the semantics of these constructions, measure nouns in the container reading express a contextually given relation R[18] between a container and a thing/substance being contained.

(40) *Glas Wasser* (container reading):
[[Glas Wasser]]: λkλx[Glas(x) ∧ R(x, ᵕ k)](Wasser)

Merging the numeral then amounts to counting the instances of containers for which this relation holds:

(41) Semantics for the transitive container reading:
a. [[Zwei Gläser Wasser]]: λnλkλx[Glas(x) ∧ R(x, ᵕ k) ∧ n(x)](Wasser)(2)
b. λx[Glas(x) ∧ R(x, ᵕWasser) ∧ 2(x)]

Consider the sample derivation of a container reading pseudo-partitive in (39). The higher φP is licensed by its closest head, #, and emerges as PL because SG's presupposition is not satisfied (CARD = 2). The lower φP agrees with N_2,[19] and in this case φ's sister does satisfy

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[18]R could be, for instance FILL (ᵕ k, x) or CONTAIN (x, ᵕ k), *vel sim.*

[19]I have excluded a lower #P in (42b) for now, since at least in German there is little direct evidence for low numerals in the DPC. In Viennese, low numerals are in fact ungrammatical:

(i) * zwei Tassen vierzig Nüsse
two cups forty nuts
Intended: 'two cups of forty nuts each'
(ii) * zwei Körbe drei Äpfel
two baskets three apples
Intended: 'two baskets of three apples each'

There is no problem with assuming that the lower φP agrees directly with N_2 in the container construction (42). However, in the marginal IPC-like construction with the prepositions *von* "of, from" or *mit* "with" in which N_2 is likewise indefinite, a low numeral is possible:

(iii) zwei Körbe mit zwanzig Karotten
two baskets with twenty carrots
'two baskets of twenty carrots each'

A low numeral is also possible if N_2 is marked with the genitive case, especially if modified by an adjective:

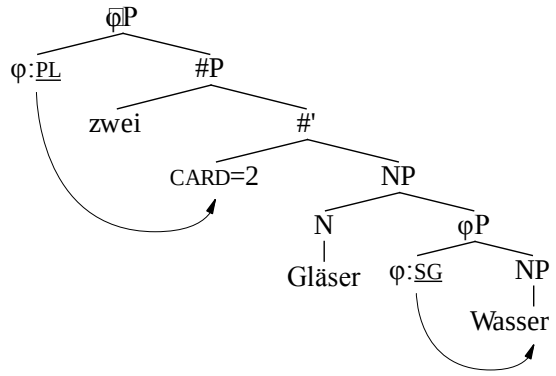
(iv) zwei Körbe dreißig grüne-r Äpfel
two baskets thirty green-GEN apples
'Two baskets of thirty green apples each.' (= 60 apples total)

Whether or not speakers accept this depends on whether they still have the genitive—speakers of Viennese find it acceptable with the provision that it sounds "bookish" or

the stronger presupposition of SG and the lower φP emerges as SG ("Maximize Presupposition").

(42) a. zwei Gläs-er Wasser
two glass-PL water
'two glasses of water' (container)

b.



Again, only the *semantic* licensing of number on φ is indicated in (39b). The valuation of morphological number on N_1 and N_2 subsequently takes place via Agree. Only the higher φP is relevant for verbal agreement, which has to be plural. However, assuming two φPs is necessary to account for the independent number marking on N_1 and N_2.

It must be added that the empirical evidence for the different status of the numeral in the quantity vs. the container reading is not as strong as one would like. The semantics of μ given in Section 3.2 explicitly call for a numeral argument, and dropping the numeral is ungrammatical, as expected (see (27) above). However, the container *Glas*, pl. *Gläser* should now pattern with regular non-relational count nouns in being grammatical without numerals. In other words, (44b) should be as good as (43b), but is markedly degraded (although not quite as bad as transitive quantity measure terms without numerals, like (27); moreover, if used intransitively, (44a-b) are perfectly grammatical).

(43) a. Die Livia hat mir zwei Bücher gschenkt.
the Livia has me two books given
'Livia gave me two books.'

b. Die Livia hat mir Bücher gschenkt.
the Livia has me books given
'Livia gave me books.'

(44) a. Die Livia hat zwei Gläser Wein zerbrochen.
the Livia has two glasses wine broken
'Livia broke two glasses of wine.'

"poetic". As for English, Keenan (To appear) adduces further arguments for assuming a low #P in English pseudo-partitives. It is possible that only IPC pseudo-partitives have both a high and a low #P, while DPC pseudo-partitives only have a high #P.

b. ?? Die Livia hat Gläser Wein zerbrochen.
the Livia has glasses wine broken
'Livia broke glasses of wine.'

On the other hand, while container reading cases like (44b) do occur in production, albeit rarely, this is never the case with the quantity reading or with standard unit terms like *Kilo*. The following examples corresponding to (44b) were found through a Google search; in all cases the reading is unambiguously the container reading.

(45) An der Bar gibt es **Gläser Wein**, beim Essen leider nur Flaschen.
At the bar gives it glasses water, at dinner unfortunately only bottles
'They have glasses of wine at the bar, but unfortunately only bottles (of wine) at dinner.'
(http://www.tripadvisor.de/ShowUserReviews-g608862-d663742-r178826081-Hotel_Maritimo-Sissi_Lassithi_Prefecture_Crete.html)

(46) Es gibt **Flaschen Wein** von Aldi, die kosten 1,39 und es gibt Flaschen, die kosten ...
It gives bottles wine from Aldi which cost 1,39 and it gives bottles which cost
'There are bottles of wine from Aldi which cost 1,39 (euros), and then there are bottles which cost… (sc. a lot more)' (http://vgsforum.sorghof.de/phpBB2-2.0.10-deutsch/viewtopic.php?p=1630&sid=5e26e297d40507a4075a7c000e35beb7)

(47) was sie da so findet sind **gläser wasser** von vor 2 tagen oder noch das shirt das ich gestern anhatte
what she there MOD.PART finds are glasses water from ago 2 days or still the shirt which I yesterday wore
'What she keeps finding there are glasses of water from two days ago, or maybe the shirt I was wearing yesterday.'
(http://www.gutefrage.net/frage/darf-meine-mum-einfach-so-mein-zimmer-durchsuchen-obwohl-ich-ihr-gesagt-habe-ich-will-das-nicht)

Substituting unambiguous measure terms like *Liter Wasser* 'liters of water' for any of the bold forms makes these sentences ungrammatical, and (45-47) are rated as grammatical by Viennese speakers who do not accept (44b) or find it degraded. This suggests that the requirement for a numeral is indeed only a property of the quantity reading, but also that dropping the numeral in transitive container phrases is dispreferred unless the context is such that the container reading is unambiguously the only possible reading.

3.4 Problems and further implications

Before going into the implications of this proposal for the structure of English pseudo-partitives, I want to discuss three specific points that could potentially be counterarguments to the analysis presented so far, namely that container and standard unit pseudo-partitives in Viennese have two different syntactic structures, and that N_1 does not always head an

NP. The first possible objection comes from the fact that certain standard units of measure, like *Tonne* 'ton', never use the plural in numeral measure phrases, contrary to what one would now expect based on the structure given in (28). The second revolves around the derivation of plural verbal agreement in phrases like *a bunch of flowers were thrown out*, which cannot be derived in either the quantity or the container structure given above. Finally, the question remains if "inert" measure nouns like *Kilo* and *Glas* in the quantity reading should be analyzed as classifiers, which touches on the analysis of measure phrases by Borer (2005). I will discuss each of these issues in turn in the following sections.

3.4.1 "Kübel" and "Tonnen"

With the structures for the quantity and the container reading in place, we can account for the behavior of measure nouns like *Glas*, *Sack*, *Korb*, etc., which only take overt plural marking in the container reading. However, there are two other groups of measure phrases in pseudo-partitives: MP which do not have an overt plural marker (e.g., *Kübel* 'bucket', but see fn. 6) and the *n*-plural cases which require plural marking for both readings with numerals higher than 'one' (e.g., *Tonne* 'ton/barrel' and many other MN that relate to dimensions other than weight, such as *Meile* 'mile', *Stunde* 'hour', *Minute* 'minute', etc., see fn. 9).

For the first group, we can simply assume that a phrase like (48a) is in fact ambiguous between the structure in which *Kübel* is the head of #P (quantity reading, (48b) and the one where it is a full NP (container reading, (48c):

(48) a. zwei Kübel Wasser
two bucket.SG/PL water
b. $[_{\#P}$ zwei Kübel$_{\mu}$ $[_{NP}$ Wasser]] (quantity)
c. $[_{\#P}$ zwei $[_{NP}$ Kübel $[_{NP}$ Wasser]]] (container)

The only additional assumption is that plural marking for nouns like *Kübel* is morphologically null and hence the two readings are morphologically indistinct. Cases like *Tonne*, on the other hand, are problematic because we now predict plural marking to be absent in the quantity reading since the measure nominal is a functional head that does not agree for number. But as already mentioned **zwei Tonne-Ø Äpfel* is never grammatical.

However, it is not clear that the *Tonne*-case constitutes a natural class of measure nouns with a discrete function and behavior. First of all, note that the relation between the container reading ('barrel') and the standard unit reading ('ton') for *Tonne* is not the same as for *Glas*. While a barrel can contain substances weighing more or less than a ton, a container "glass" cannot contain more than a unit "glass". Therefore (49a) is perfectly fine, whereas (49b) is infelicitous.

(49) a. Diese Tonne enthält drei Tonnen Sand.
This barrel contains three tons sand
'This barrels contains three tons of sand.'

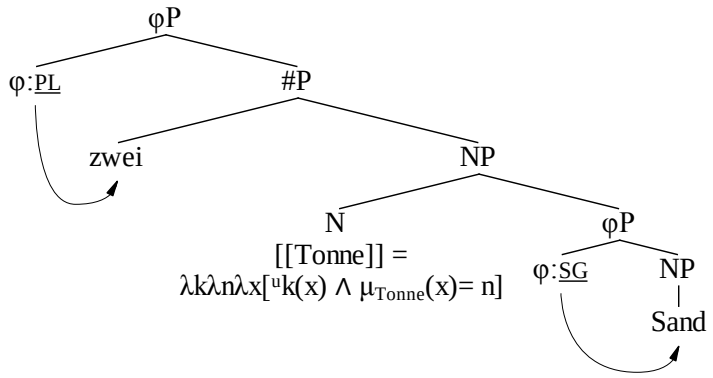
b. # Dieses Glas enthält drei Glas/Gläser Wasser
This glass contains three glass/glasses water
'This glass contains three glasses of water.'

Of course, (49b) is acceptable in a context where glasses of different sizes are available, but the unmarked, context-free interpretation is based on the entailment relation between container *Glas* and unit of measure *Glas*, which is why (49b) usually fails. On the other hand, there is no such entailment relation between container *Tonne* ('barrel') and unit of measure *Tonne* ('ton'). It seems that in the case of *Tonne*, we should operate with two separate lexical items: 1. *Tonne* 'barrel' (container), 2. *Tonne* 'ton' (= 1000 *Kilos*, standard unit). Historically, one can see how the one would have developed out of the other, but synchronically they must be kept separate.

I have not been able to find more cases like *Tonne*. Other measure nouns that take the *n*-plural are unambiguously standard units (*Gallone* "gallon", *Meile* "mile" (not used in Austria), *Stunde* 'hour', *Tag* 'day', etc.), but note that not all of these are frequently used in transitive constructions (e.g., *zwei Tage Urlaub* 'two days of vacaction'). They have the syntactic properties of container phrases (as discussed in section 3.3: overt plural morphology, word stress on N_1, etc.), but the semantics of standard units (as discussed in section 3.2). Since we have already established that there are good arguments for assuming two separate structures for the two readings for *Glas*-type nouns, one must ask why nouns like *Tonne* (unit), *Stunde*, and *Tag* did not adopt the more grammaticalized quantity reading structure as it became available. The reason for this may ultimately be a difference in grammaticalization paths for different groups of nouns, as the diachronic data in section 5 suggest. This difference must have arisen out of a combination of the loss of overt plural morphology for some measure nouns and the fact that standard units of *weight* are often more grammaticalized than other measure nouns at any given synchronic language stage, leading to the establishment of a separate structure for the quantity reading for some container nouns, but not necessarily for nouns like *Stunde* or *Tag*, which are not as easily construed as relational (in the way *Kübel* and *Glas* are). A possible structure for *Tonne*-type nouns is given in (50). These nouns are inherently relational, number-seeking entities like *Kilo*, etc., but are of the right syntactic category (N) to agree with a higher φP for number.

(50) a. Zwei Tonnen Sand (quantity)
two tons sand
'two tons of sand'

b.



This structure crucially differs from the container noun structure that was introduced in 3.3, in which CARD mediates between the numeral and the container noun. This was necessary because container nouns like *Glas* 'glass' and *Sack* 'sack' do not always combine with numerals (while measure nouns like *Kilo* are inherently specified for a numeral argument). However, we could assume that certain nouns like *Tonne* 'ton', while being essentially nominal and heads of NPs are also inherently relational and always take numerals as arguments. That is, they constitute an intermediate stage between the fully grammaticalized quantity structure of (28) and the container structure of (39). They have the semantics of measure nouns like *Kilo*, but are of the right syntactic category to agree with a higher φ. This also goes for cases like *Stunde* 'hour' or *Meile* 'mile', whose denotation must be similar to that of a standard unit of weight (but differing from these in that they are usually intransitive, cf. the denontation of intransitive *zwei Glas* in (25)):

(51) [[Stunde]]: $\lambda n \lambda x[\mu_{Stunde}(x) = n]$

That is, *Stunde* and *Tonne* (unit) behave like inert standard units of measure in always taking a numeral argument. However, they are always mapped to a structure in which they head an NP and agree with a higher φP for number. I address this "intermediate stage" between being a true measure term and a fully referential container noun in more detail in section 4 on English.

3.4.2 Indefinite measure phrases and variable agreement

As already mentioned, with the indefinite article both singular and plural agreement are grammatical with certain measure phrases:

(52) a. Ein Haufen Blumen wird/werden weggeworfen
a heap flowers gets/get thrown.away

'A bunch of flowers get/gets thrown away.'

b. Ein Glas Nüsse ist/??sind genug.
a glass nuts is/??are enough
'A glass of nuts is/are enough.'

c. Ein Kilo Erdäpfel sollt(e)/?sollten reichen.
a kilo potatoes should.SG/?should.PL suffice
'A kilo of potatoes should be enough.'

Note that "group" or "collective" nouns like *Haufen* 'heap' or *Menge* 'amount, bunch' are better with variable agreement than container nouns and standard units of measure. The same is true in English:

(53) a. A bunch of flowers was/were thrown out.
b. A cup of nuts is/??are enough.
c. A pound of potatoes has/*have gone bad.

In (52a) and (53a), singular goes with the referential reading, plural with the quantity reading. The referential reading is unproblematic and has already been discussed (section 3.3.). In German, there is furthermore a potential confound concerning the constructions with the indefinite article in that it is homophonous with the numeral *ein/e* "one". In the present analysis, the numeral should always trigger singular agreement on the verb. Contrastive stress on the numeral (indicated by capitals in (54)) disambiguates the numeral from the indefinite constructions. While the latter allows both agreement patterns (depending on the reading), the numeral rules out plural on the verb, as expected:

(54) a. EIN Kilo Karotten ist/*sind schon verkauft worden.
*One kilo carrots is/*are already sold become*
'*One* kilo of carrots has already been sold.'

b. EIN Sack Äpfel war/*waren verschimmelt.
*One sack apples was/*were moldy*
'*One* sack of apples was moldy.'

c. EINE Tasse Nüsse reicht/*reichen nicht.
*One cup nuts suffices/*suffice not*
'*One* cup of nuts is not enough.'

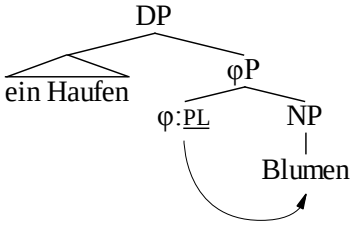
We can thereby disambiguate the unproblematic referential reading from the quantity reading, which is problematic in several respects. First, recall that the semantics of μ as defined in (28) explicitly call for a numeral as argument of μ, which is absent in (52). Moreover, in these examples φ seems to be able to "look through" N_1 and the singular indefinite article and be licensed by the plural on N_2, which is undesirable given that we have defined number on φ as being licensed by the head of its closest sister. What this suggests is that the structure in (28) is inadequate to account for cases like (52), in which the indefinite article and the measure term together behave similarly to quantifiers like *some* and *many* with plural verbal agreement. Before suggesting an alternative for the plural

cases, it is worth pointing out that these constructions differ from the quantity-reading pseudo-partitives discussed so far. They lack a numeral and pattern together in German and English (while numeral pseudo-partitives diverge in the two languages). In other words, it seems a priori legitimate to treat these cases as different from the ones discussed in 3.1-3.3. Note furthermore that the version with plural agreement is marginal, singular is preferred in both languages.

To deal with the marginal plural agreement cases, I suggest that "group" nouns like *Haufen* 'heap', *Menge* 'amount, *bunch*, etc., in combination with the indefinite article, are quantificational determiners of type $\langle\langle e,t\rangle,\langle\langle e,t\rangle,t\rangle\rangle$. That is, they formally and functionally pattern with generalized quantifiers like *a lot*, *many/much*, *little/few*, etc. In fact, *a lot* is a neat example of how this quantificational (semantically "bleached") meaning can develop out of concrete, referential NPs: *lot* meant 'portion, piece, share' (as in *allot*, *allotment*, etc.), but has all but lost this meaning on the way to becoming a true quantifier in transitive pseudo-partitives. Indefinite DPs like *ein Haufen* and *eine Menge* in German are undergoing a similar development and turning into quantifiers. Such an analysis provides a straightforward way of explaining why φ can "see through" the measure phrase in the quantity reading in (52). Sauerland (2003) argues that quantifiers generally are not of the right type to be arguments of φ. On the other hand, different quantifiers seem to select different semantic properties (*several* selects PL, *much/many* select kinds, etc.). It would make sense, then, to operate with a structure like (55) in which a quantificational DP like *ein Haufen* selects a particular type of φP (SG, PL, kinds …). Number on φP is licensed by its sister, as usual, and will emerge as PL if φ's sister is a bare plural noun.

(55) a. Ein Haufen Blumen
a heap flowers
'a heap/a lot of flowers'

b.



I leave the internal structure of the quantifier *ein Haufen* open here. What is important is that this structure explains the surprising "quantificational" reading of the indefinite N_1

phrase and the fact that number agreement is determined by N_2.[20] It also reinforces the point made in 3.1-3.3, namely that the licensing of semantic number (understood here as checking for atomicity) concerns *properties* rather than any particular NP and can happen at different relative "hights" in the functional spine of an NP, depending on intervening functional projections (like #P).

There are some similarities of this analysis to the one proposed by Schwarzschild (2002), who locates both quantifiers and measure phrases in the specifier of a quantificational phrase QP. It differs, however, in precisely how the following broadly quantificational noun phrases are grouped together:

(56) a. Three apples
b. Many apples
c. A bunch of apples
d. Three kilos of apples

Schwarzschild groups a, b, and d together (he does not discuss c), while I group b and c together, but keep numeral constructions separate from other quantificational phrases. In particular, I have concentrated on cases like d, in which an (argument-taking) measure term is introduced into the semantics of the phrase, which specifies the dimension of quantification. These specific "measure semantics" are absent from a, b, and c, which is why I have excluded them from the general discussion.

3.4.3 Is *Glas* a classifier?

As an anonymous reviewer has pointed out, there is a possible alternative to this analysis, which rests on the work of Borer (2005). Borer's starting point is the notion that all nouns start out as mass nouns and that their mass/count status is determined by the presence or absence of functional structure that "divides" the mass noun into countable partitions. This "dividing" function is spelled out as a classifier in a language like Chinese, but as plural marking in languages like English and German. This system predicts a complementary distribution of classifiers and plural marking.

Borer furthermore argues that at least in Hebrew and English, measure nouns head their own extended projection in the quantity reading, that is, they are biphrasal. Her crucial examples are Hebrew constructions such as (57a-b) (Borer's (36a) and (37a) on p. 251),

[20]It would, however, require a slight modification of Sauerland's claim that verbal agreement takes place between T and a φP in its specifier. In the modified version, agreement takes place between T and the highest functional projection in its specifier. This will be a φP in most cases; in cases like (55) feature percolation of PL to D would be a relatively unproblematic assumption.

which she calls "container phrases" but which can only have what has so far been labelled the "quantity reading", that is, they are non-referential and receive a quantity interpretation ((57b) could be translated as "one bottleful of milk" according to Borer).

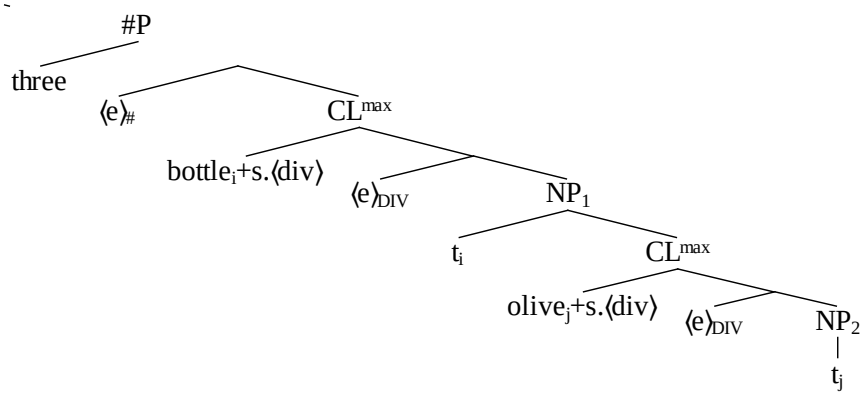
(57) a. šloša baqbuq-**im** zeytim
three bottle-s olives
b. ʾexád baqbuq xalab
one bottle milk

These differ from regular construct state (CS) measure phrases in which the measure noun is interpreted as a concrete noun and takes the regular number morphology:

(58) šloša baqbuq-**ey** zeytim
three bottle-s olives

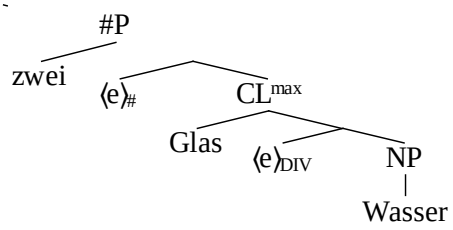
Note that in Hebrew, both the quantity reading (= Borer's "container phrases") and the container/referential reading (= CS nominals) have plural morphology on N_1, unlike in German. In Borer's system, this means that N_1 must move to the specifier of the "classifier" projection CL where it receives plural marking (cf. Borer 2005: 96; 253f.). In (57a), both the measure noun and the substance noun must move to the specifier of a designated CL projection, to account for the fact that both N_1 and N_2 have plural morphology, as illustrated in (59) (cf. Borer's (42c), p. 253):

(59)



One could now assume that the measure nouns in Viennese pseudo-partitives that lack plural in the quantity reading are actually instantiations of the classifier head and have the same dividing function as plural morphology. The structure of quantity-reading pseudo-partitives in Viennese would therefore be:

(60)



Pseudo-partitives in the container reading, on the other hand, would be similar to (59), with N_1 picking up plural morphology by moving to CL. This would make Viennese German similar to Armenian, which also has both classifiers and plural morphology, albeit in complementary distribution (Borer 2005: 94ff.).

There are several reasons why Borer's system cannot simply be applied to the Viennese data. First, the pluralless measure nouns in the quantity reading do not behave like classifiers in "typical" classifier languages. They are not obligatory in numeral + count noun constructions, and they always contribute a semantic relation of measurement to the phrase, which classifiers do not do.[21]

Furthermore, if Viennese measure nouns like *Glas* and *Sack* were classifiers in the quantity reading, the generalization that classifiers and plural morphology do not co-occur could not be upheld, since Viennese would then apparently allow both to co-occur in cases like (61a), in which *Sack* would have to be interpreted as a classifier co-occurring with the plural-marked substance noun *Karotten.*

(61) a. zwei Sack Karotte-**n** (quantity, count noun)
two sack carrot-PL
'two sacks of carrots'

b. zwei Säck-**e** Karotte-**n** (container, count noun)
two sack-PL carrot-PL
'two sacks of carrots'

(62) a. zwei Glas Wein (quantity, mass noun)
two glass wine
'two glasses of wine'

b. zwei Gläs-**er** Wein (container, mass noun)
two glass-PL wine
'two glasses of wine'

[21]In the words of Cheng and Sybesma (2012: 635): " … the sortal classifiers that are used with nouns in Chinese languages when counting (among other contexts) are elements that do not *create* a unit, which is what measure expressions (*kilo, bottle of*) do; instead, they merely *name* the unit that is already part of the semantic denotation of the noun."

As far as I can see, in Borer's system the only way to account for the lack of plural marking on N_1 in (61a) and (62a) would be to say that they are base-generated as classifiers. However, in that case the plural marking on N_2 in (61a) is not predicted, since *Karotte* would have to move to CL itself in order to get plural. This should not be possible because its target position is already occupied by *Sack.* While Viennese/German DPCs share important characteristics with Hebrew "container phrases" and CS constructions,[22] the lack of plural marking on N_1 in the quantity reading is where the two languages diverge, and the paradigm in (61-62) cannot easily be handled in Borer's approach under the assumption that measure nouns like *Glas* and *Sack* behave like classifiers in classifier languages.

Moreover, I assume that the functional projection responsible for number marking (φP) is above #P, whereas in Borer's system this projection is below #P (CL). The main argument for high φP in German, following Sauerland (2003) and Scontras (2013), is that semantic number seems to be determined by the denotation of the sister of φP, which must be #P in numeral constructions. This is shown by the following number agreement data from German quantity reading pseudo-partitives in the subject position. In (63a), the sister of φP is the cardinal *zwei*. The denotation of *zwei* does not satisfy the one-ness presupposition for SG, and the entire phrase emerges as semantically plural. Verbal agreement with φP takes place, resulting in plural morphology on the verb. (63b), on the other hand, crashes because the verb does not agree with φP_{PL}.

(63) a. $[_{\varphi P}\,[_{\#P}$ Zwei Glas $[_{NP}$ Wasser$]]]_{PL}$ sind_{PL} schon in die Suppe
two glass water are already into the soup
gschüttet worden.
poured become
'Two glasses of water have already been poured into the soup.'

b. * $[_{\varphi P}\,[_{\#P}$ Zwei Glas $[_{NP}$ Wasser$]]]_{PL}$ ist_{SG} schon in die Suppe gschüttet
two glass water is already into the soup poured
worden.
become
* 'Two glasses of water has already been poured into the soup.'

Now, if φP were in fact below #P, we would expect the opposite agreement pattern. φP would agree with N_1, which would satisfy SG's presupposition, resulting in φP_{SG} and agreeing with a singular-marked verb. The fact that it is the denotation of the numeral, and not of the substance noun, that always wins out in determining Number is a strong argument in favor of assuming a Number head (at least) above #P.

Although this discussion cannot be exhaustive, I hope it suffices to sketch out how possible counterarguments to the analysis presented here could be addressed. Next, I return

[22]See Corver (1998) for a comparison of the Hebrew CS with Dutch (DPC) pseudo-partitives.

to the question of the structure(s) of English pseudo-partitives.

4. The structure of English pseudo-partitives

In terms of the prosody, morphology, and extraction properties of pseudo-partitives, English provides less evidence for two separate structures than German does. Selkirk (1977: 313) nevertheless assumes two separate structures to account for the two readings of English pseudo-partitives like *a bunch of flowers*. In both of her proposed structures, N_1 heads an NP. Stickney 2009 on the other hand argues that the measure noun in English pseudo-partitives heads a semi-functional projection MP, based on the transparency behavior of pseudo-partitive N_1 with respect to adjectival modification, (64a), which is not found in partitives, (64b):

(64) a. a moldy box of chocolates (either can be moldy)
b. a moldy box of those chocolates (only the box is moldy)

The fact that the adjective is able to "look through" N_1 in the pseudo-partitive, but not in the partitive is explained by movement of the adjective from a lower position to a position where it can scope over both N_1 and N_2 in (64a). This movement is blocked by the intervening DP in the partitive in (64b). Another piece of evidence comes from recursion. Stickney 2009: 61ff. shows that recursive structures are possible in the partitive (65a), Stickney's (57)), but not in the pseudo-partitive ((65b)., Stickney's (60)):

(65) a. A crate of those boxes of the big red cartons of Bessie's milk.
b. ?? Three crates of cartons of milk tasted slightly sour.

While N_1 is the head of the phrase in partitives and selects a PP (which can select another NP, and so on), pseudo-partitives must be headed by N_2 to account for the impossibility of structures such as *MP-of-NP-of-MP-of-NP… or *MP-of-MP-of-NP. In other words, the measure noun must be the head of a more "functional" category within the extended projection of the substance noun to account for the lack of recursion and the transparency effect of adjectives in pseudo-partitives.

However, not all pseudo-partitives behave the same way with respect to these diagnostics. As Stickney herself points out, there is evidence for a second pseudo-partitive structure in cases like (66), in which only N_1 is interpreted as modified by a preceding adjective and the transparency behavior appears to be suspended (Stickney 2009: 68):

(66) A metal box of chocolates.

Furthermore, recursion in the pseudo-partitive is perfectly acceptable in the container reading:

(67) Three crates of cartons of milk were put on the table.

Stickney opts for a second structure that is intermediate between the partitive and the pseudo-partitive ("N_1-headed pseudo-partitive") for these cases, namely an [NP_1 [(*of*) NP_2]] structure similar to the one that was proposed for the German container reading in section 3.3. This would mean that the the "variability" of adjectival modification in English, as in (64a), is an indication that there are actually two structures in English rather than one ambiguous one, just like in German. In the unit reading, (68a), N_1 heads a semi-functional category and is "transparent" for adjectival modification, whereas in the container reading, (68b), N_1 heads an NP and N_2 is not modified by the adjective.[23]

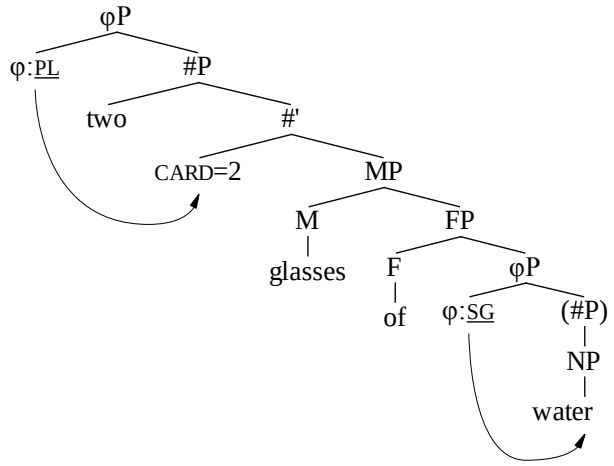
(68) a. [… moldy [$_{MP}$ box(es) [$_{FP}$ of [$_{NP}$ <moldy> chocolate]]]]
b. [… moldy [$_{NP1}$ box(es) [$_{FP}$ of [$_{NP2}$ chocolate]]]]

One way of accomodating this insight into the analysis developed here would be to adopt Stickney's structure and assume that English measure nouns head a "semi-functional" category MP in the quantity reading. Like in German, φ agrees with the closest head, but this must be head of the numeral projection (presumably occupied by CARD) in both readings because the measure noun is never the head of #. The interpretation of English pseudo-partitives in both readings would then proceed more along the lines of the German container reading (cf. (42)) than the German quantity reading (cf. (28)). This is shown in (66) (based on Stickney 2009 and Keenan To appear).

[23]Note, however, that these cases are rarer than the default case in which N_2 is descriptively the head of the pseudo-partitive. For a more detailed account of the variation in adjectival modification in pseudo-partitives, see Stickney et al. 2013.

(69) a. *two glasses of water*

b.



"Semi-functional" (or "semi-lexical") projections like MP have also been proposed elsewhere (e.g., Van Riemsdijk 1998, Corver 1998, Alexiadou et al. 2007) to account for the "mixed" properties of measure nominals in languages like English, Dutch, and Greek. The measure noun is selected by a #P in numeral constructions and can agree with φP for number (unlike N_1 in the unit reading in Viennese German).

However, it is noteworthy that in English the two readings do not appear to behave syntactically, morphologically, or prosodically different, contrary to Viennese German. That is, the English unit and container readings both have the same number marking properties, conditions on extraposition and topicalization, and prosody. The main evidence for a semi-functional category MP are lexical semantic restrictions on predicate selection and adjectival modification. The only syntactic evidence that seems to point to a structural difference is in fact the lack of recursion in quantity reading pseudo-partitives and the variation in verbal agreement found in pseudo-partitives in which N_1 is a container or group/collection noun:

(70) a. A bunch of flowers was/were thrown out.
b. Two cups of sugar is/are on the table.

I have already argued that singular verbal agreement in numeral measure phrases like (70) b. is not necessarily an argument for verbal agreement with N_2, given the collective reading of the resulting phrase (see section 3.2). In (70a), *a bunch* seems to have the same properties as the German indefinite *ein Haufen*; an analysis for this class has already been proposed in section 3.4.2. The question is therefore whether we should reconsider the category MP. This category was set up based on three main arguments: the transparency for adjectival modification, the cases where N_2 selects the predicate, and the lack of recursion. First, note that the transparency behavior of adjectives in English shows more variation than usually

reported in the literature. In particular, the lack of this transparency effect in the partitive is less strict a rule than one would like, with many speakers allowing modification of N_2 by a high adjective in the partitive, as Stickney et al. (2013) show. They argue that this may be indicative of an ongoing syntactic change in English by which partitives are being grammaticalized to pseudo-partitives. This makes adjectival modification a rather unreliable structural diagnostic for pseudo-partitives.[24] The same is true for predicate selection. Consider the following sentence, taken from a restaurant review:

(71) From there he brought us two disgusting glasses of Pinot Grigio.

[24]In Viennese, the transparency effect with respect to adjectival modification is likewise difficult to pinpoint. On the one hand, there are undoubtedly cases of transparent behavior of N_1 in the quantity reading (as expected), such as (i). On the other hand, some speakers also accept modification of N_2 with an intervening container N_1, as in (ii), even though in this case N_1 heads an NP and is therefore not expected to be "transparent" for modification of N_2:

(i) a. Ich hab zwei grausliche Glas Wein trunken.
I have two disgusting glass.SG wine drunk
'I drank two glasses of disgusting wine.'

b. Ich hab zwei pasteurisierte Liter Milch gekauft.
I have two pasteurized liters milk bought
'I bought to liters of pasteurized milk.'

(ii) a. Ich hab zwei grausliche Gläser Wein trunken.
I have two disgusting.INDEF.PL glasses.PL wine.SG drunk
'I drank two disgusting glasses of wine.'

b. ? Ich hab zwei ungezuckerte Packerl(-n)Kekse wegghaut.
I have two unsweetened.INDEF.PL pack(-PL) cookies.PL thrown.out
'I threw away two packs of unsweetened cookies.'

Note that whether or not the agreement morphology on the adjective is compatible with N_2 is irrelevant for these cases, as shown by (iia) vs. (iib). A further complication is the fact that speakers seem to either accept all examples with preposed adjectives and modification of N_2 (independent of quantity vs. container reading), or none. Furthermore, contrary to English the "transparent" interpretation in which the adjective preceding N_1 modifies N_2 is also possible in the partitive, as in (iii). This is not expected at all, since in the partitive a PP-DP-structure intervenes between the two nouns and should act as a barrier for this interpretation (this is claimed to be the case in English partitives).

(iii) Ich hab zwei ur grausliche Flaschen von dem burgenländischen Wein
I have two EMPH disgusting bottles of the from.Burgenland wine
kauft.
bought
'I bought two extremely disgusting bottles of that wine from Burgenland.' (the wine is disgusting, not the bottles)

It seems that *where* the adjective is interpreted in such cases is largely determined by pragmatics and world knowledge. Because of these problems, I have excluded the "adjectival modification test" from the diagnostics for Viennese pseudo-partitives, even though they certainly warrant further study.

(http://www.yelp.com/biz/ristorante-umbria-san-francisco?start=40)

The context makes it clear that it is the wine that is disgusting, rather than the glasses. We would therefore assume that this is the MP-of-NP construction, in which the adjective has moved across N_1, which is a "transparent" semi-functional category and allows the reading in which the wine is disgusting. However, the context and the predicate *bring* would a priori make one expect the container reading, since we are talking about things filled with wine rather than the quantity of wine itself. While coercing the container reading, as in (72), makes the sentence somewhat worse in the reading where the wine is disgusting, it is not clear that this is an argument for a structural difference between container reading and quantity reading pseudo-partitives. It simply means that coercion of a particular reading is possible with certain predicates (and adjectives).

(72) ? He accidentally smashed two disgusting glasses of Pinot Grigio.

In other words, English quantity reading pseudo-partitives of the type *two glasses of water* or *two pounds of apples* have same problem as German *Tonne*-type nouns (see section 3.4.1): they have the same morphosyntactic and prosodic properties as referential container nouns, but the semantics of quantificational units of measure.

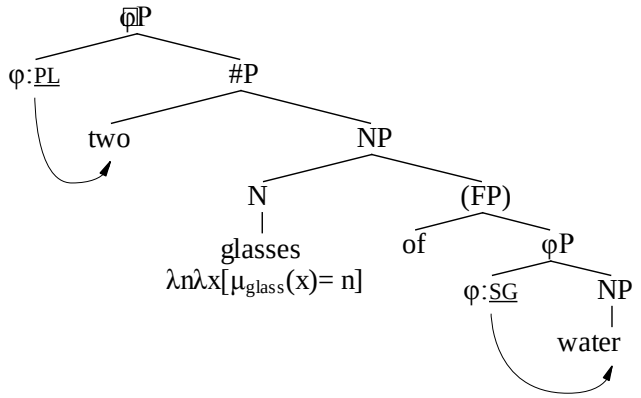
If we accept that the adjectival modification and predicate selection properties of these phrases are not sufficient evidence for positing a separate category MP, we could extend the analysis proposed for *Tonne*-nouns to English. The difference between glass (container) and glass (unit) would then be that the latter is inherently relational and argument-seeking while the former is not.

(73) a. [[*glass*]]: $\lambda x[glass(x)]$ (container)
b. [[*glass*]]: $\lambda n \lambda x[\mu_{Glas}(x) = n]$ (quantity/unit)

A quantity reading pseudo-partitive based on (73b) would therefore not need a CARD operator when combining with a numeral. N_1 heads an NP and agrees with φ, which itself is licensed by #P and surfaces as plural, as illustrated in (74).

(74) a. two glasses of water

b.



This approach would fall in quite naturally with the analysis developed here based on Sauerland's approach to morphological number marking, in which only certain categories (in this case, N) can agree with a higher head licensed for semantic number. That is, we would not have to assume that English has a category M that can agree for number in addition to N (and maybe D and A), but could stick to the same set of cross-linguistic categories within the nominal domain. This move also dispenses with the concept of a "semi-functional" category in these kinds of phrases, which from the point of view of economy is a desirable result. Treating the difference in adjectival modification and predicate selection between the two readings as epiphenomenal allows us to operate with two different semantics that are mapped to more or less the same structure (minus the CARD operator in the quantity reading), but crucially predicts independent number marking on N_1 and N_2 in both readings, contrary to German.

Finally, the impossibility of recursion in the quantity reading may be due to a more general restriction on recursion in relational nouns and the types of arguments these select. Thus (75b), while somewhat better than (75a), is still awkward.

(75) a. ?? two crates of cartons of milk tasted slightly sour
b. ? two photos of pictures of Mary came out blurry

It nevertheless has to be said that the recursion evidence is still the best *syntactic* argument in favor of assuming a different (semi-functional?) category for N_1 in English quantity reading pseudo-partitives. However, the important finding is that based on the number marking properties of its measure nouns, English could in principle be analyzed as having two structures for the quantity and the container reading that are only minimally different and in which N_1 crucially heads the same category in both readings. While the container reading structure NP_1-*of*-NP_2 should be fairly uncontroversial, the exact structure of the quantity reading may need some more tweaking (and depends on whether or not one is prepared to accept a "semi-functional" category MP).

To conclude this section,we have seen how differences in the surface behavior of pseudo-partitives in German and English reflect structural differences between them, and that these differences reflect how much functional material is incorporated in these constructions and what exact position the measure noun occupies in each reading. The English IPC provides less direct evidence for two separate syntactic structures than the German DPC and is less "grammaticalized" (its measure nouns show number agreement, have word stress, etc.). However, based on the comparison with German and the evidence from recursion (and maybe also adjectival modfication and predicate selection), it is possible to discern a separate container structure in English, too, even though it is less conspicuous than in (Viennese) German.

In the next section, I show that this gradience in the functional structure of pseudo-partitives (and especially the degree of grammaticalization of N_1) is closely linked to the diachronic development of pseudo-partitives in English and German.

5 The diachrony of pseudo-partitives

Studies addressing pseudo-partitives from a diachronic perspective stress that they tend to develop out of partitives (e.g., Koptjevskaja-Tamm 2001, Rutkowksi 2007, Stickney et al. 2013). Koptjevskaja-Tamm (2001: 535) argues that nominal partitives develop out of verbal partitive ("separative") structures, like "to cut *a slice from the cake*". Grammaticalization of a measure nominal like *slice* from a lexical into a functional category and structural simplification (in the sense of Roberts and Roussou 2003) eventually turn the nominal partitive into a pseudo-partitive. This development entails the change of N_1 from a lexical into a (more) functional category, the loss of definiteness on N_2 and the erosion or loss of the intervening PP.

While this development is indeed found for container nouns in the diachrony of English and German pseudo-partitives, nouns denoting standard units of measure (*Pfund*/*pound*, etc.) behave differently. This is because they never have the lexical structure associated with the referential reading in ambiguous measure nominals like *glass* and *sack*. In the case of container nouns such as these, the quantity reading is entailed by the container reading and can eventually become associated with a different, grammaticalized structure (as evidently happened in Viennese German, Dutch, and Danish). Standard units, on the other hand, do not have a referential (container) reading, hence there is no reason to expect any structural ambiguity for them. This makes a number of interesting predictions. We expect, for example, that standard units are likely to be heads of functional categories already at earlier stages of the languages under investigation, while ambiguous nominals like *glass* are expected to exhibit less grammaticalized behavior. We also expect standard

unit nominals to be more likely to be morphologically inert even if container nouns at the same stage are not. In the following brief sketches of pseudo-partitives in English and German I argue that this is by and large the case, although there is still a great deal of variation.

5.1 Middle to Modern English

Old English (OE, ca. 500-1,150 CE) and, to a lesser extent, Middle English (ME, ca. 1,150-1,500 CE) used the "partitive genitive" to mark N_2 in measure phrase constructions. Partitive genitives usually follow the quantifier, i.e., the measure noun or quantificational adjective (Allen 2008: 86ff.). The loss of the partitive genitive (and postnominal genitives in general) cannot be discussed here in detail, but already during the OE period, partitive genitives begin to be replaced by *of*-phrases and are completely replaced by them by the fourteenth century (David 1913: 10, Koike 2006: 51), i.e., during the Middle English period.

Middle English differs from Modern English in that standard units of measure like *pound* tend to behave like the German measure phrases discussed above, i.e., they have invariant singular/plural forms when they combine with numerals (Mustanoja 1960: 57f.), especially in transitive (partitive) constructions. For instance, both OE *pund* and ME *pound* have synchronic plural forms, but almost exclusively use the singular form in transitive pseudo-partitives (cf. MED P.1: 1166ff.):

(76) for **a þousend pound of golde**
'for a thousand pounds of gold' (MED P.1: 1167)

(77) He hath a sparth of **twenty pound of wighte**
'He has a sparth (= type of axe) of 20 pounds of weight' (Chaucer, *Canterbury Tales*, A.2520, late 14th century)

The same behavior is also found for certain quantificational phrases that do not necessarily denote a standard unit, e.g.:

(78) and the noyse was in the bestes bealy lyke unto the questyng of **thirty coupyl houndes**
'and the noise in the beast's belly was like the questing of thirty couple hounds'
(Thomas Malory, *Morte D'Arthur*, 1470, 3:19)

ME is furthermore interesting in that during the stage of losing the morphologically distinct post-nominal genitive and before *of* became obligatory, it behaves like Modern German in juxtaposing N_1 and N_2 without requiring distinct case marking on N_2:

(79) Me were leuere slepe Than **the beste galoun wyn** in Chepe
'I would prefer sleep to the best gallon of wine in Cheapside'
(Chaucer, *Canterbury Tales*, H.24, late 14th century)

(80) to the same place **iij sakkes lyme**
'to the same place three sacks of lime' (ca. 1465, MED S.1: 37)

That is, Middle English developed its own DPC at this stage. Unlike in German, container nouns like *galoun* and *sakke* in (79) and (80) do not lose their number morphology in transitive numeral constructions, while standard units like *pound* do not have plural forms in these constructions. Container nouns also differ from standard units in that they often select *mid*/*with* 'with', (81a), or *ful of* 'full of', (81b) besides *of*, (81c), to link the container and the substance noun (parallel to IPCs in Danish, Dutch, and to a lesser extent, German):

(81) a. tonnen mid wyn
'barrels with/of wine' (Ayenbite of Inwyt, 1340)
b. sakkes ful of straw (1387, MED S.1: 37)
'sacks full of straw'
c. And he seyde he owhte hym **an hundred bareles of oyle**.
'and he said he owed him a hundred barrels of oil.'
(English Wycliffite sermons, ca. 1400)

English evidently had both IPC and DPC pseudo-partitives in earlier stages of the language. The IPC (N_1-*of*-N_{2INDEF}) was generalized in Modern Standard English, while "Recipe English" (see the Appendix) is a (somewhat marginal) example of a synchronic English DPC. While the Middle English standard unit nominal *pound* tended to be morphologically inert, container nouns did not lose plural morphology in transitive numeral constructions.

5.2 Middle to Modern High German

Like in English, the most distinctive change in pseudo-partitives between Old High German (OHG, ca. 600-1,100 CE) and Middle High German (MHG, ca. 1,100-1,400 CE) on the one hand and Modern High German (*Neuhochdeutsch*, NHG) on the other was the loss of genitive case marking ("partitive case") on N_2. Genitive case on N_2 was obligatory up until the early modern period and sometimes accompanied by the fronting of the genitive phrase. However, the general rule for partitive genitives in MHG is that they follow the measure noun ((83), from Paul 1904: 116), as in Middle English. The same holds for ambiguous or non-genitive marked substance nouns (82).

(82) drîzic pfunt bisande
thirty pound.SG byzants.PL

‘Thirty pounds of byzants (= a type of coin)’ (*Flore und Blanscheflur*, ca. 1220)

(83) a. ein fuoder guoten wines
a cartload good.GEN wine.GEN
‘a cartload of good wine’
b. ein stücke brôtes
a piece bread.GEN
‘a piece of bread’

The loss of the partitive genitive proceeded much more slowly than in English and has not been completed in all dialects. Some prescriptive grammars still permit genitive case on N_2 in pseudo-partitives, but Bavarian and other German dialects have lost the genitive entirely.

As (82) shows, standard units of measure were inert with respect to number marking in combination with numerals already in MHG (Grimm 1889: 1810). Container nouns, on the other hand, differ in several respects. First, they usually take plural inflection after numerals and second, they are at this stage rarely juxtaposed with substance nouns in the same way that standard units and quantifiers are. Rather, the prepositions *mit* ‘with’ or *von* ‘of, from’ are used:

(84) ain offen glas mit wein oder mit wazzer
an open glass with wine or with water
‘an open glass of wine or of water’
(Konrad von Megenburg, *Buch der Natur*, ca. 1350)

(85) Mit einem glass von guotem wein
with a glass of good.INDEF wine
‘with a glass of good wine’ (Henrich Wittenwiler, *Der Ring*, ca. 1400)

Modern High German has almost completely replaced these constructions with the juxtaposed pseudo-partitives (the equivalent of the Dutch and Danish DPC). *Von* (and *mit*, to a lesser extent) are almost exclusively used in partitives, in which N_2 is definite.

5.3 Summary

Historically, both English and German show a tendency for standard units of measure (i.e., NPs that only have a quantity reading) to be inert with respect to number marking, whereas container nouns tend not to give up their plural morphology so easily. This is expected under the analysis presented in section three, where I have argued that measure nouns such as *Kilo* and *Gramm* only exist as functional heads of #P and do not agree for number. Container nouns, on the other hand, are different. Because their referential reading entails the quantity reading, the existence of the latter does not necessarily lead to grammaticalization as a functional category and loss of plural morphology, as both English and German show. This also means that the lack of plural morphology on standard unit

nouns cannot simply be explained as a consequence of the loss of number and case morphology by sound change, since this would equally affect standard unit and container nouns.[25]

Furthermore, both English and German show a tendency for associating standard units with DPCs, while container nouns tend to show up at IPCs at earlier stages of these languages. German eventually extended its DPC to container nouns, while English went in the opposite direction and generalized its IPC in all contexts.

It is puzzling that both English and German went through a stage in which standard units of measure were inert with respect to plural marking and then apparently reintroduced plural morphology on such units. This is in fact obligatory in Modern (Standard) English, but 19th century NHG also has plural marking on standard units such as *Gramm* 'gram' and *Pfund* 'pound':

(86) zehn Gramm-e Salpetersäure
ten grams-PL nitride acid
'ten grams of nitride acid' (*Polytechnisches Journal*, vol. 40 (1831), p. 456)

(87) Ein Pfund Cochenille liefert zwei Pfund-e trockn-en Lack
one pound cochineal renders two pound-PL dry-ACC.SG lacquer.ACC.SG
'One pound of cochineals gives two pounds of dry lacquer' (Prechtl, Johann Joseph (1817), *Grundlehren der Chemie in technischer Beziehung*, vol. II, p. 488)

It is possible that this development was due to prescriptivism and the notion that *Pfund* and *pound* should behave like other nouns and hence have plural marking in numeral constructions.[26]

The grammaticalization process of container nouns in German can be handled straightforwardly in Van Gelderen (2011)'s economy-driven minimalist approach. Van Gelderen argues that phrasal categories diachronically tend to become reanalyzed as heads. During language acquisition, the "Head Preference Principle" (HPP) ensures that children analyze structurally ambiguous input as X rather than XP.

(88) Head Preference Principle (HPP, Van Gelderen 2011: 13):
Be a head, rather than a phrase.

---

[25]See Allen 2008: 173f. for further arguments that sound change alone cannot account for the syntactic change in English partitives from the Old English to the Middle English period.

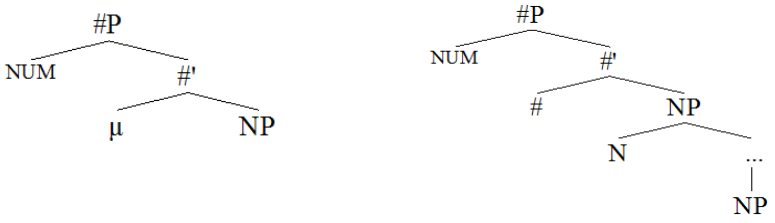
[26]Another possibility was pointed out to me by Elly van Gelderen: Measure nouns like *Kilo* or *pound*, despite being functional to some extent, have a concrete meaning that "real" quantifiers like *some*, *many*, *a lot*, etc., lack. That is, *Kilo* means "1000 grams" and *pound* means "16 ounces". It is possible that this specific meaning of standard units of weight prevents them from undergoing complete grammaticalization into a quantifier and the loss of their number features in some languages, resulting in the impression that they are only "semi-functional".

The second economy principle proposed by Van Gelderen ist based on the notion that movement operations ("internal Merge") are more costly than (external) Merge ("Merge over Move", see, e.g., Chomsky 1995) and that the latter is therefore preferred. During language acquisition, the "Late Merge Principle" (LMP) ensures that children analyze ambiguous strings as having arisen through Late Merge rather than Move:

(89) Late Merge Principle (LMP, Van Gelderen 2011: 14):
Merge as late as possible.

These principles apply to our data as follows. Compare the (simplified) structures of German standard units, (90a), vs. German container nouns, (90b), in pseudo-partitives:

(90) a. German, quantity: b. German, container:



In the case of a container noun like *Glas*, there is enough unambiguous evidence in the input for the language learner to warrant positing the structure (90b), in which the measure noun is an NP (this is the evidence discussed in Sections two and three: number features on the measure noun, normal word stress, possility of fronting, etc.). In the case of standard units of measure like German *Kilo*, on the other hand, there is no (unambiguous) evidence from the prosody, morphology or syntax of the measure noun that would warrant positing a full NP structure. The LMP and the HPP will therefore ensure that the measure noun is analyzed as a head rather than a phrase (HPP) and that it is merged in a functional projection higher than NP_1 in (90b) (LMP), namely as the head of #P (90a). In Viennese German (and related dialects), a further step took place in that some container nouns that were ambiguous between the quantity and the container reading also became ambiguous between the two structures, i.e., language learners did not always have enough unambiguous evidence to posit (90b), which resulted in the creation of a "grammaticalized" structure for the quantity reading of these nouns, in accordance with the LMP and HPP.

For reasons of space, the full development of IPC-structures out of partitives and ultimaltely verbal "separative" phrases cannot be discussed here (but see Koptjevskaja-Tamm 2001 and Rutkowski 2007 for detailed accounts). Both English and German had DPC and IPC pseudo-partitives in the course of their history. While German gave up the IPC pseudo-partitive in MP constructions, English has generalized the IPC in all types of

pseudo-partitives, with the exception of the marginal phenomenon of the "recipe pseudo-partitives". Whether this was due to language-external reasons or principles of economy similar to the ones discussed above must be left open here.

6 Conclusion

The internal structure of complex noun phrases in Germanic has been a matter of debate, since ambiguous pseudo-partitives like English *two glasses of water* appear to map different semantic properties to morphologically and syntactically identical structures. Viennese pseudo-partitives, on the other hand, distinguish between unit and container readings in that for a certain class of nouns, plural marking on the measure noun is only found in the container reading. I have argued that this is because these two readings are associated with two different syntactic structures, and that consequently these two types of pseudo-partitives differ with respect to number marking, the status of the numeral, fronting of N_1 vs. N2, phrasal prosody, and predicate selection. The following table summarizes the distribution of these properties for Viennese German.

Table 3. Properties of quantity vs. container pseudo-partitives in Viennese

Quantity reading	Referential/container reading
Sg./default marking on N_1	Pl. on N_1
Topicalization of N_2 possible	Topicalization of N_2 degraded
(Topicalization of N_1 + N_2)	(Topicalization of N_1 + N_2)
No/weak word stress on N_1	Word stress on N_1
N_2 determines verbal agr.	N_1 determines verbal agr.
N_2 selects predicate	N_1 selects predicate
Numeral argument obligatory	Numeral not obligatory

In the unit reading, the measure noun heads a functional category (#P), whereas in the container reading it is referential and heads an NP. Measure nouns that function as #-heads in Viennese are inert with respect to number marking because they are not of the right syntactic categegory to agree for number with the number-valuing head φ. They pick out a subset of a kind-denoting term and take a numeral argument. The numeral is an argument of the μ-head in the quantity reading of pseudo-partitives, but not in the container reading.

With respect to cross-linguistic variation, I have argued that measure nouns designating a standard unit tend to have the most grammaticalized structure at any synchronic stage, that is, they tend to head functional (or semi-functional) categories. This

is the case of the Viennese DPC in the quantity reading, the DPC in Danish, which disallows plural morphology on standard units of measure, and to a lesser extent the DPC in Dutch (see the Appendix). English pseudo-partitives, on the other hand, are IPCs and functionally pattern with German pseudo-partitives in the container reading. They differ from German in that the measure noun *always* agrees for number, irrespective of the reading. I have argued that based on comparative considerations, the lack of direct morphosyntactic evidence for a structural difference in English means that English measure nouns are always NPs, with the twist that some of them are number-seeking relational NPs (in the case of standard units like *pound* and the quantity reading of *glass*, etc.). This may be preferable to an analysis that posits a "semi-functional" (non-NP) category for N_1 in the quantity reading.

Table 4. provides a summary of the properties of pseudo-partitive constructions in English, Standard German (= Gm.) and Viennese.

Table 4. Properties of Germanic pseudo-partitives

	Quantity reading	Container reading
Pl. on N_1/ *Kilo*-nouns	Engl.	Engl.
Pl. on N_1/*Glas*-nouns	Engl., Gm.	Engl., Gm., Viennese
Word stress on N_1	Engl., Gm.	Viennese, Gm., Engl.
N_1 determines verbal agr.		Gm., Viennese, Engl.
N_2 determines verbal agr.	Gm., Viennese, Engl.	

Although not all of the diagnostics used in table 4. may be applicable to any given language, they can in principle be used to detect micro-variation in the structure of pseudo-partitives even between closely related dialects. While some languages on the surface display little or no structural differentiation in their pseudo-partitive constructions (e.g., Standard English), others have established a more grammaticalized structure for the quantity reading that has different properties than the container reading (e.g., Viennese German, Dutch, Scots English (see the Appendix)). A comparative approach that takes microvariation in syntax and morphology seriously, combined with a constrained theory of the syntactic and semantic licensing of number marking, can detect this subtle gradience in the syntactic structure of pseudo-partitives and predict the parameters of their variation.

Appendix: Variation in pseudo-partitive constructions in English, Danish, and Dutch

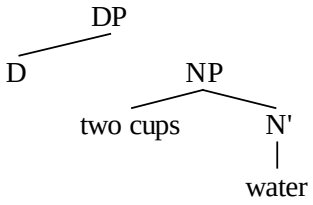
A. English

Aside from the pseudo-partitive constructions discussed in sections 2.1 and 4, English also has a less frequently discussed construction which like German juxtaposes N_1 and N_2 and often occurs in the lists of ingredients for recipes, e.g.:

(91) a. Add two cups water
b. Heat two spoons oil
c. Three ounces nuts
d. One pound lettuce

Abney (1987: 290ff.) briefly discusses these "recipe pseudo-partitives" and analyzes the measure noun as an argument of N_2:

(92) two cups water



It is not clear how this account would handle the fact that N_1 and N_2 receive number marking independently of each other, as in the examples in (91). Nor does this structure leave room for adjectives intervening between N_1 and N_2, which is possible:

(93) a. Add two cups hot water and mix.
b. One pound fresh fish.

It is more likely that this is the grammaticalized DPC version of (74) (or (69) b., depending on whether or not one accepts the category MP) with "structural simplification", that is, loss of the functional projection FP, but without loss of number morphology on N_1.

Some English dialects furthermore retain the linker *of*, but are similar to German pseudo-partitives and Dutch DPCs in that they only have plural marking in the container

reading. One such dialect is Scots English. Standard units of measure in Scots are usually inert with respect to plural marking[27]:

(94) a. three pund o mince
b. three yaird o ribbon
c. three pint o milk

Containers, on the other hand, can occur both with and without plural morphology:

(95) three bottle/s o beer

Although number morphology does not necessarily have the same consequences for predicate selection as in German, there are contexts in which only one form can be used. For example, modification by adjectives specifying some physical quality of the container coerces the container reading and makes the selection of the pluralless form ungrammatical:

(96) I put three empty bottle*(s) o beer in the bin.

This suggests that Scots English is undergoing a grammaticalization process similar to German, starting with differentiating the quantity and the container reading through number morphology.

B. Danish

Hankamer and Mikkelsen 2008 discuss the Danish DPC, which behaves similarly to Viennese pseudo-partitives with respect to plural marking on N_1. They note that many of the items occurring in the DPC are inflectionally deficient and do not take plural marking (examples from Hankamer and Mikkelsen 2008: 324):

(97) a. tre liter vand
three liter.SG water
b. * tre liter-e vand
three liter-PL water
'Three liters of water'

They also note that measure nouns which do have plural forms, i.e., container nouns such as *pose* 'bag' or *stabel* 'pile' rarely occur in the DPC with plural inflection. In fact, they seem to be restricted to the Danish IPC, in which a preposition (*af* "of", (98), Hankamer

[27]I am grateful to Andrew Weir for bringing Scots English to my attention and for providing the following data.

and Mikkelsen 2008's (21) or *med* "with", (99), Hankamer and Mikkelsen's (27)) intervenes between N_1 and indefinite N_2:

(98) en gruppe af tourister
a group of tourists

(99) pose-r med mel
bag-PL with flour

Inflectionally deficient standard units such as *liter* and *kilo*, on the other hand, are restricted to the DPC and cannot occur in the IPC, as (100) and (101) (Hankamer and Mikkelsen's 23) and 24)) show :

(100) en liter (*af) vand
a liter of water

(101) et kilo (*af) smør
a kilo of butter

Danish seems to have taken a path intermediate between the German and the English situation, assigning quantity readings to the DPC and referential/container readings to the IPC. This is reminiscent of the situation in MHG discussed in section 5.2.

C. Dutch

Like Danish, Dutch has several types of pseudo-partitive constructions. Vos (1999) distinguishes between Direct Partitive Constructions (DPC) and Direct Content Constructions (DCC). DPCs correspond to the Danish DPCs discussed above and to German pseudo-partitives with a quantity reading. They lack plural marking, (102a) and trigger singular agreement on the verb, (103a). DCCs correspond to the German pseudo-partitives with a container reading. They have overt plural marking, (102b), and trigger plural agreement on the verb, (103b) (examples from Vos 1999: 51, 62).

(102) a. vier liter bier (DPC)
four liter.SG beer
b. vier liter-s bier (DCC)
four liter-PL beer
'four liters of beer'

(103) a. Twee liter melk is/*zijn zuur geworden (DPC)
*two liter.SG milk is/*are sour been*
b. Twee liter-s melk *is/zijn zuur geworden (DCC)
*two liter-PL milk *is/are sour been*

‘two liters of milk went sour’

Unlike in Viennese German, standard units of measure like *liter* or *kilo* can be plural-marked in Dutch transitive MP constructions. According to Vos, this results in two different readings: (102a) refers to a quantity of four liters of beer (collective reading), whereas (102b) refers to four separate quantities of beer, each of which is one liter (distributive reading).

However, Dutch differs from Viennese in that the optionality in number marking does not exist for container nouns, for which plural is obligatory with numerals higher than ‘one’[28]:

(104) a. Jan heeft twee glazen wijn gedronken
Jan has two glasses.PL wine drunk
b. * Jan heeft twee glas wijn gedronken
Jan has two glass.SG wine drunk
‘Jan drank two glasses of wine’

Container nouns like *glas* distinguish between a referential and quantity reading, as expected (Corver 1998: 236). Fronting of N_2 is apparently possible at least in some dialects of Dutch (Vos 1999: 118), but not all speakers find it acceptable. Contrary to Viennese, fronting is only possible if N_1 is plural-marked, which is expected given the ungrammaticality of (104b).

(105) a. ?/* Bramen$_i$ heb ik drie emmers t_i geplukt.
blackberries have I three buckets picked
‘As for blackberries, I picket three buckets.’
b. ?/* Wijn$_i$ heeft Jan twee glazen t_i gedronken.
wine has Jan two glasses drunk
‘As for wine, Jan drank only two glasses.’

Corver (1998) also notes that Dutch pseudo-partitives show “transparent” behavior with respect to adjectival modification and obey similar selectional restrictions as in German and English with respect to predicate selection.

Dutch also has an IPC, which is extensively discussed by Vos. For our purposes, it suffices to conclude that Dutch marginally uses number marking in the DPC to distinguish between two readings of measure phrases denoting a standard unit: a collective reading (no plural) and a distributive reading (plural). However, unlike in Viennese German this distinction has not been extended to container nouns.

[28]I am grateful to Coppe van Urk, Erik Schoorlemmer, and Lobke Aelbrecht for their judgments and discussion of the Dutch data.

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