A morphosyntactic decomposition of countability in Germanic

Marijke De Belder

Abstract This paper contributes to our understanding of countability in two ways. First, I derive the various mass and count readings from the interaction between two syntactic features, viz. [Div] (which creates countable items, cf. Borer 2005) and [Size] (which creates units). Second, I show how crosslinguistic variation in the expression of countability can be reduced to whether [Div] and [Size] each head their own projection or are combined on a single syntactic head (cf. Thráinsson 1996; Bobaljik and Thráinsson 1998). Finally, I discuss the various Germanic morphemes that can realize the [Size] feature.

Keywords diminutive · Dutch · German · mass-count distinction · nominal inflection · units & kinds

0 Introduction

This paper is a study on the features and heads that determine countability in the Germanic DP. More specifically, I will discuss variation in two types of count readings. The first one is the kind reading in (1), the second one the unit reading as illustrated in (2) [1].

1) I studied **two chocolates**: a low fat variety and a normal one. [kind]
2) Grandma gave me **two chocolates**: one for me and one for my sister. [unit]

When the DP *two chocolates* gets the kind reading, the phrase can be paraphrased as *two kinds of chocolate*. It is therefore referred to as the kind reading[2]. The DP *two chocolates* in the second example can be paraphrased as *two pieces of / two portions of chocolates* and is here referred to as the unit reading. Note that both

[1] In (1-2) I use two different contexts to make the two readings more easily accessible. The different contexts are not necessary, however, to provoke the two readings. The NP *two chocolates* is ambiguous in itself. Hence, the following example is ambiguous as it is pragmatically compatible with both readings: *The laboratory worker gave me two chocolates.* Under the kind reading, the laboratory worker gave me two varieties, under the unit reading she gave me two pieces of chocolate.

[2] Despite the fact that they bear the same name, the kind reading that I shall be discussing must not be confused with Carlson's kind reading (Carlson 1977). Carlson's kinds are kinds on a referential level. They are bare NPs which semantically behave like constants, i.e. as the proper name of an entire kind. They do not allow for quantifiers as they are not variables. They can be used both generically (e.g. *Dogs are loyal*.) and existentially (e.g. *There are dogs lying in the garden*.). The kind reading under discussion here is a kind reading on a conceptual level. They can occur as variables (e.g. *this chocolate, the two chocolates, all chocolates*, …). The kind-unit distinction reveals the nature of the denotation of the variable. Note that both unit and kind readings can occur as Carlsonian kinds if used as a bare NP. *Chocolates can be melted* is ambiguous between a kind and unit reading in terms of this article, whereas it is always a Carlsonian kind.

the kind and unit reading are count readings. This is shown by the use of the cardinal in (1) and (2).

This paper shows that the unit and kind readings occur in Dutch, Afrikaans and German and that the distinction is not only semantic, but also syntactic. They can be derived from the interplay between the same two features in these languages, viz. [Div] and [Size]. The number of heads to express these features differs, however. The nominal phrases under discussion therefore support the view that languages select features from a universal set provided by UG, but that they can have split or unsplit functional domains (as proposed by Thráinsson 1996 and Bobaljik and Thráinsson 1998 for the IP domain).

Throughout the paper I assume that the building blocks of Narrow Syntax are morphosyntactic features. Vocabulary insertion, i.e. insertion of phonological material, only takes place after Syntax, according to the Subset Principle. In other words, a phonological string may realize a certain head if it is specified for the features on that head or a subset thereof (Halle and Marantz 1993; Harley and Noyer 1999).

This paper is organized as follows. In section 1 I first present two semantic tests to distinguish between kind and unit readings. I then present some background on Borer's syntactic analysis of the mass-count distinction (Borer 2005), which I adopt. In the final part of the section the two different count readings in Dutch are introduced and it will emerge that Borer's analysis does not suffice to account for these data. The adaptation of the analysis is the main concern of section 2. The two count readings are assigned different structures. Countability is derived from two syntactic features. The first feature is the dividing feature [Div] (Borer 2005). This feature divides stuff into countable items. The second feature is [Size]. This feature assigns the unit interpretation to the noun. Section 3 extends the analysis to Afrikaans, section 4 to Standard German. I will propose that Dutch and Afrikaans have a split countability domain, whereas German has an unsplit countability domain. In section 5 we will see that the noun *stuk/Stück* 'piece' can also realize the feature [Size]. The observations in this section provide further support for the claims made in the paper. Section 6 is an afterthought on the role of encyclopedia in language. Section 7 sums up and concludes.

1 Two count readings: kinds and units

In this section I first discuss the semantics of kind and unit readings. I then address Borer's (2005) analysis of the mass-count distinction. Finally, I focus on two morphologically distinct count readings in Dutch. These data will lead to the conclusion that the traditional split between mass and count readings does not suffice to cover these more fine-grained distinctions.

1.1 The semantics of kind and unit readings

In this section I discuss the semantics of the unit and kind reading briefly. I will restrict myself to the semantic details which are needed for the purposes of this paper[3].

The two readings can be teased apart by means of two tests. First, kinds do not allow for modification by the adjectives *whole* and *complete*, whereas units do[4]. This is shown in (3) and (4).

3) *I studied **two complete chocolates**: a low fat variety and a normal one. [kind]
4) Most of the chocolates in the box were broken, but grandma gave me **two complete chocolates**, one for me and one for my sister. [unit]

In the kind reading in (3) it is not clear what the completeness refers to. In the unit reading in (4) the completeness refers to the unit.

The second test relies on the fact that kinds can be in many places at the same time, whereas units cannot (Zemach 1970). The following pair of examples illustrates the difference: (5) shows a kind reading, (6) a unit reading.

5) Right now, we store **this chocolate**, the low fat variety, both in laboratium A and laboratorium B. [kind]
6) *Right now, I keep **the chocolate** grandma gave me both in the kitchen and in my drawer. [unit]

Note that kinds share both properties with mass readings.

7) *I ate **some complete chocolate**. [mass]

[3] For a more detailed discussion the reader is referred to De Belder 2008 and Zemach (1970).
[4] Cf. De Belder (to appear) for a detailed discussion on the interaction between *whole* and units.

8) Right now, we store **chocolate** both in laboratium A and laboratorium B.[mass]

Example (7) shows that mass readings do not allow for modification by *complete* either, (8) shows that mass readings are not tied to one place.

The following semantic distinction underlies both tests. Kinds are continuous in space, whereas units are bounded in space (Zemach 1970). As such, one can establish the position of a unit and whether it is complete. Kinds, on the other hand, are not bounded in space. For kinds we do not count instantiations in space, but varieties. We know, for example, that glucose, fructose and saccharose are three different sugars. However, we do not know how much space such a variety occupies in the world, nor is such a variety tied to one place. Kinds share this property of not being bounded in space with mass readings, as is illustrated by example (8) above.

Summing up, in this section I have shown that unit readings and kind readings can be semantically distinguished from one another. The core difference lies in the fact that units are bounded in space, whereas kinds are not. Kinds share this property with mass readings.

1.2 The mass-count distinction

Before discussing the distinction between the two count readings, viz. kind and unit readings, I would like to present an account on the broader distinction between mass and count readings in this section. This account will be used as a starting point for the analysis of kinds and units.

Borer (2005) proposes that the mass-count distinction does not stem from the lexicon, but is syntactically derived. The hypothesis that nouns, or more specifically roots, are not lexically marked as mass or count receives support from the fact that roots that are traditionally categorized as count nouns can easily get a mass reading[5].

[5] An anonymous reviewer points out that according to this proposal the sentence *Our company produces shoe* should be grammatical and synonymous to *Our company produces footwear*. The grammaticality follows indeed, the synonymy does not. It has been noted that when nouns get a mass reading, the obtained reading is the ground reading. Gleason (1965: 136-137) pointed out that all nouns can be interpreted as mass in the following context: *Mother termite is concerned over her child: "Johnny is very choosey about his food. He will eat book, but he won't eat shelf."* This effect was recognized by Pelletier (1979) and called the *universal grinder* (Pelletier 1979:5-6). The proposal thus predicts that *shoe* can enter a mass reading grammatically, where it will be interpreted as ground shoe. Note that it will not be interpreted as footwear. Similarly, the reviewer points out that *shoe* cannot be the complement of *a lot of*. I think the akwardness of *a lot of shoe* is due to our knowledge of the world in which we do not use ground shoe. It is not unthinkable in a children's story on termites: *Johnny ate a lot of shoe yesterday.*

9) Grandma has three dogs. [count]
10) There is dog all over the wall. [mass]

The noun *dog* is prototypically seen as a count noun, as (9) shows. Still, it can get a mass reading as in (10), where the sentence gets the interpretation that the dog has exploded. Conversely, roots that are traditionally categorized as mass nouns can get count readings easily.

11) We produce a lot of linen. [mass]
12) This is a good linen. [count]

The noun *linen* is traditionally seen as a bona fide mass noun (cf. (11)). Nevertheless, it can be used without any problem in a count reading as in (12). The fact that roots can get both mass and count readings is unexpected if they are marked as count nouns or mass nouns in the lexicon. Borer therefore proposes that roots are lexically unmarked, that the mass reading is the default reading and that the count reading is derived by syntax. Specifically, count readings can be derived by merging the syntactic head Div°, i.e. a dividing head, with the noun. This head can be realized as the indefinite article in singular count readings (13) or as plural marking in plural count readings (14). The absence of Div° yields the default mass reading (15)[6,7].

13) There is a chicken in the garden. [count]
14) There are chickens in the garden. [count]
15) There is chicken on my plate. [mass]

This view will be adopted throughout the paper.

To summarize, Borer proposes a syntactic derivation of the mass-count distinction. She analyzes the mass reading as the default one. The count reading is syntactically derived by merging Div°.

[6] Note that the fact that mass readings cannot be individuated does not imply that they cannot be quantified, for example by *much*, which realizes a quantificational head above DivP (Borer 2005, 119).
[7] Note that the distinction between the generic reading of bare mass nouns (*I love water*) and the existential reading (*There is water on the floor*) stems from the different types of predicates (Carlson 1977), not from any effect in the lower domain of the NP. As a result, the distinction between these two readings is orthogonal to the discussion.

1.3 Kind and unit readings in Dutch

The addition of an indefinite article or plural marking to English nouns[8] results in count readings that are ambiguous between kind and unit readings[9]. This is illustrated in (16) – (18). Example (16) shows a mass reading, (17) has an indefinite article and (18) has plural marking. Consequently, (17) and (18) are ambiguous between kind and unit readings.

16) I tasted chocolate.

17) I tasted a chocolate.
kind: 'I tasted a certain kind of chocolate.'
unit: 'I tasted a piece of chocolate.

18) I tasted the chocolates.
kind: 'I tasted the different kinds of chocolate.'
unit: 'I tasted the pieces of chocolate.

The same holds for Dutch nouns which are traditionally seen as count nouns. The addition of an indefinite article or plural marking yields count readings which are ambiguous between kind and unit readings. This is illustrated in (19) – (20). Example (19) shows the indefinite article, (20) shows plural marking.

19) een fiets
a bicycle
kind: 'a kind of bicycle (e.g. a mountainbike)'
unit: 'a bicycle (i.e. one object)'

20) tweefietsen
two bicycles
kind: 'two kinds of bicycles (e.g. a mountainbike and a city bike)'
unit: 'two bicycles (i.e. two objects)'

However, if one adds an indefinite article or plural marking to Dutch nouns which are traditionally seen as mass nouns, the same ambiguity does not arise; the NP can only get the kind reading. This is shown in the following examples. (21) is a mass reading, (22) has an indefinite article and (23) shows plural marking. Both (22) and (23) only get a kind reading.

---

[8] The term 'noun' is an abbreviation for 'a root which is merged under nominal functional structure'.
[9] It is implied that bare mass readings cannot get kind readings. They can, of course, be interpreted as kind readings in Carlson's terms (Carlson 1977). (See footnote 2).

21) Ik proefde chocolade.
I tasted chocolate
'I tasted chocolate.'

22) Ik proefde een chocolade.
I tasted a chocolate
'I tasted a certain kind of chocolate.'
* 'I tasted a piece of chocolate.'

23) Ik proefde chocolade-s.
I tasted chocolate-PL
'I tasted different kinds of chocolate.'
* 'I tasted pieces of chocolate.'

In order to derive a unit reading for these nouns in Dutch, one needs to add a diminutive morpheme in addition to the indefinite article or plural marking. The default interpretation will be something like 'a piece of a few square or cubic centimeters consisting of the stuff referred to by the noun.' This is illustrated in (24) and (25) (cf. Wiltschko 2006).

24) Ik proefde een chocola-tje.
I tasted a chocolate-DIM
* 'I tasted a certain kind of chocolate.'
'I tasted a piece of chocolate.'

25) Ik proefde chocola-tje-s.
I tasted chocolate-DIM-PL
* 'I tasted different kinds of chocolate.'
'I tasted pieces of chocolate.'

Examples (24) – (25) show that the semantic distinction between kind and unit readings is reflected by a morphological distinction in Dutch for nouns which are traditionally called mass nouns. The absence of the diminutive morpheme gives rise to kind readings for these nouns, the presence of the diminutive makes the unit reading the most salient reading[10]. I propose that this morphological

[10] Note that the diminutive does not contribute any affect to examples such as (42). In affective readings, the diminutive is licit in many more contexts, as pointed out to me by Jenny Doetjes. For example in exclamatives (but also in other contexts), even kind readings allow for a diminutive, e.g. *Wat een lekker wijntje!* Lit. 'what a tasteful wine-DIM' 'Such a great wine!' I assume that this affective diminutive syntactically occupies a different head than the unit-denoting diminutive. (Cf. Steriopolo 2008 on the syntactic and morphological distinctions between diminutives expressing size and those expressing affect in Russian and De Belder 2009 on the distinction between affective projections and unit deriving projections in Dutch and Italian.)

distinction suggests that the kind-unit opposition is also a product of syntax. This means that syntax not only derives the mass-count distinction as Borer (2005) suggests, but also the kind-unit distinction within the count readings. Note that Borer's Div°-head does not suffice to account for the semantic distinction between kinds and units in these Dutch data. Moreover, Borer's structure does not provide a head that can host the diminutive morpheme. In the next section I will therefore propose an additional head Size° that hosts the feature [Size] that can be morphologically realized as the diminutive morpheme.

I postpone the question why the morphology of nouns which are traditionally seen as mass nouns should differ from the ones which are called count nouns until section 6. In that section I reconcile the morphologically different behavior with Borer's view that all roots are featureless.

2 The syntax of mass, kind and unit readings

In this section I show that we can account for the three-way split between the mass reading, the count kind reading and the count unit reading if we assume that that countability results from the interaction between two features, viz. [Div] and [Size]. I will further propose that the diminutive is an overt realization of [Size].

2.1 The proposal

Recall from the semantics of kind and unit readings (cf. section 1.1) that these readings are mainly distinguished by the fact that units are bounded in space, whereas kinds are not. Moreover, we have seen for Dutch that the diminutive morpheme is the morphological means to set these readings apart (cf. section 1.3). I therefore propose that this morpheme realizes a feature that contributes the property of being bounded in space to the structure of the DP. I call this feature [Size]. I do not think it is a coincidence that the diminutive morpheme, which is a size marker, can express units. Research into cognition shows that there is a tight link between being bounded in space and having a certain shape or size. If an item is bounded in space its surface necessarily has linear boundaries which are called edges (Jackendoff and Landau 1992). These edges serve to define the shape and size of the object. As such, there is a strong cognitive connection between being a unit and having a certain shape or size.

In this section I propose that kind and unit readings are syntactically distinguished by the [Size] feature, in an interaction with the [Div] feature (see section 1.2). I adopt Borer's proposal that the [Div] feature serves to divide stuff into countable items. It is realized by means of the indefinite article or number marking. The interaction between the two features [Div] and [Size] yields the following hypothetical possibilities: (i) both features are absent, (ii) only [Div] is present, (iii) both [Div] and [Size] are present and (iv) only [Unit] is present. I will show that (i) the absence of both features yields the default mass reading, (ii) that the presence of [Div] in the absence of [Size] results in count kind readings, (iii) that the presence of both features generates count unit readings and (iv) that the presence of [Size] in the absence of [Div] is illicit. This is schematized below.

26)

	DIV	SIZE
mass reading	absent	absent
count kind reading	present	absent
unit kind reading	present	present

As mentioned before, I assume that structures are related to readings (mass, kind, unit) and not to nouns. In other words, all nouns can in principle enter all structures.

To detect the presence of these heads, I use the possible presence of overt number marking and the diminutive as a diagnostics. Recall Borer's (2005) proposal that the indefinite article and plural marking are overt realizations of [Div] and that both are hosted by Div°. I follow Borer in the assumption that plural marking indicates the presence of [Div]. I further assume that the diminutive is an overt realization of [Size] and that it is hosted by Size°.

2.2 Both features are absent: mass readings

Mass readings as in (27) do not allow for plural marking. This is shown in (28). They do not support diminutives either, as can be seen in (29).

27) Ons bedrijf produceert **vilt**.
our company produces felt
'Our company produces felt.'

28) # Ons bedrijf produceert **vilt-en**.
our company produces felt-PL
(disallowed under a mass reading)

29) * Ons bedrijf produceert **vilt-je**.
our company produces felt-DIM

From the absence of number marking and the diminutive I conclude that the features that are expressed by these morphemes are equally absent from the

structure. Mass readings thus have a structure that lacks both Div° and Size°. This is represented in (30).[11]

30) [$_{DP}$ [$_{D'}$ D° [$_{NP}$ [$_{N'}$ N°]]]]

2.3 Only [Div] is present: Kind readings

Kind readings as in (31) allow for plural marking, as is illustrated in (32). On the other hand, they do not support diminutives, as (33)[12] shows.

31) Ons bedrijf produceert **een vilt**.
our company produces a felt
'Our company produces a kind of felt'

32) Ons bedrijf produceert **vilt-en**.
our company produces felt-PL
'Our company produces kinds of felt'

33) * Ons bedrijf produceert **een vilt-je**.
our company produces a felt-DIM
(disallowed under a kind reading)[13]

From these facts one can conclude that kind readings are syntactically derived by merging Div° but not Size°[14]. (34) is an illustration of this structure.

34) [$_{DP}$ [$_{D'}$ D° [$_{DivP}$ [$_{Div'}$ Div° [$_{NP}$ [$_{N'}$ N°]]]]]]

[11] Projections that are irrelevant for the issues under discussion are left out.

[12] Several reviewers point out that lexicalized diminutives, such as the English noun *duckling* and the German noun *Eichhörnchen* 'squirrel' can get mass and kind readings, although they are diminutives. De Belder et al. (2009) point out that diminutives come in two kinds: there is a derivational diminutive alongside the inflectional one. The derivational diminutive is inserted below the categorial head, the inflectional one above. This article only sheds light on inflectional diminutives; they interact with the other projections above the categorial head, which results in the various countability readings. As a consequence, they cannot get mass and kind readings. Derivational diminutives, on the other hand, are inserted too low in the structure to interact with inflection (also see Marantz (2009) on categorial heads as phase heads). De Belder et al. (2009) assume that all English diminutives are derivational diminutives. Hence, they are not expected to be incompatible with mass and kind readings.

[13] But see footnote 17 on affective readings.

[14] An anonymous reviewer wonders if I would assume that compounds that are based on nouns such as *kind, style, sort, type, ...* realize Div°, as they do not seem to get mass readings or unit readings. I think this assumption is undesirable for two of reasons. First of all, I do not think Div° should be characterized as a 'kind' projection, but as a projection that is responsible for assigning countable structures. Secondly, this assumption would yield the false assumption that such nouns are in complementary distribution with number marking. Moreover, I do not agree that such compounds are incompatible with unit readings. On the contrary, I would like to suggest that their most natural reading from a *syntactic* point of view *may be* the unit reading (the unit being the sort). This is indicated by the fact that they combine with the pre-determiner quantifier *heel* (see section 1.1 in which it is argued that *whole* can be used as a diagnostics for unit readings):
Heel dat hondenras lijdt aan epilepsie.
whole that dograce suffers on epilepsy
'The entire dog kind suffers from epilepsy.'
Also note that they combine easily with the diminutive morpheme in Dutch: *automerkje* 'small car brand', *katoensoortje* 'small cotton kind'. In fact, it is the kind reading which I cannot force. I presume this is due to reasons of intelligibility; *two dog kinds* should be paraphrasable by *two kinds of dog kinds* in a kind reading. This is nonsense to me. Another issue is the fact that they do not seem to get mass readings. Recall that the mass interpretation yields the ground version of the noun. It is not clear what the ground version of a sort would be.

This structure is the same for kind readings of nouns which are traditionally called count nouns (such as *dogs* in (35)), as for nouns which are traditionally called mass nouns (such as *felt* in the examples above).

35) De poedel en de jack russell zijn **hond-en**
the poodle and the Jack Russell are dog-PL
die ook geschikt zijn voor de jacht.
that also suitable are for the hunting
'The poodle and the Jack Russell are kinds of dogs that are also suitable for hunting.'

36) [$_{DP}$ [$_{D'}$ [$_{DivP}$ [$_{Div'}$ hond-en$_{(Div)}$ [$_{NP}$ [$_{N'}$ ~~hond~~]]]]]]

In (36) the noun undergoes head-to-head movement from N° to Div°, where it merges with number marking.

Notice that I do not propose that the [Div] feature is a kind feature[15]. It is a feature which yields countable items. Kind readings are thus count readings which lack the property of having size. In other words, kind readings are count readings which are not bounded in space.

2.4 Both features are present: unit readings

Unit readings allow for both plural marking and diminutives. Example (37) illustrates this.[16]

37) Er kleven **vilt-je-s** onder de stoelpoten.
there stick felt-DIM-PL under the chairlegs
'There are pieces of felt under the chairlegs.'

The cooccurence of these morphemes leads to the conclusion that unit readings are derived from a structure that has both Div° and Size°, as in (38).

38) [$_{DP}$ [$_{D'}$ D° [$_{DivP}$ [$_{Div'}$ Div° [$_{SizeP}$ [$_{Size'}$ Size° [$_{NP}$ [$_{N'}$ N°]]]]]]]]

Again, this structure is the same for all nouns, as in (40).

---

[15] Several authors (Delsing 1993, Vangsnes 2008, Van Riemsdijk 2005) propose that kind readings in Germanic result from the presence of a silent classifier (such as TYPE), most notably in *what for*-constructions. I think it may well be the case that such a construction exists alongside the one I propose.

[16] See also footnote 10.

39) Ik heb **de** **hond-je-s** geaaid.
I have the dog-DIM-PL petted
'I have petted the little dogs.'

40) [$_{DP}$ [$_{D'}$ de [$_{DivP}$ [$_{Div'}$ hond-je$_{(Size)}$-s$_{(Div)}$ [$_{SizeP}$ [$_{Size'}$ ~~hond-je~~$_{(Size)}$ [$_{NP}$ [$_{N'}$ ~~hond~~]]]]]]]]

Singular count readings of non-small units have the same structure, but with zero morphemes.

41) Ik heb **de** **hond** geaaid.
I have the dog petted
'I have petted the dog.'

42) [$_{DP}$ [$_{D'}$ de [$_{DivP}$ [$_{Div'}$ hond-∅$_{(Size)}$-∅$_{(Div)}$ [$_{SizeP}$ [$_{Size'}$ ~~hond-∅~~$_{(Size)}$ [$_{NP}$ [$_{N'}$ ~~hond~~]]]]]]]]

The structure in (42) is identical to the one in (40). The difference between the two examples lies in the fact that (40) has overt plural marking, whereas (42) has a null morpheme for the singular. In the same way, (40) has an overt diminutive, whereas (42) has a null morpheme for unmarked non-small unit[17].

2.5 Only [Size] is present

Items that are assigned size are, as a matter of conceptual necessity, individual items. Hence, if something acquires the [Size] feature, it automatically becomes countable. In other words, the presence of [Size] implies the presence of [Div]. From this follows the correct prediction that every Dutch diminutive is also pluralizable.

3 Kinds and units in Afrikaans

We have seen that in Dutch kind readings can be derived by means of number marking and unit readings by means of the combination of number marking and

[17] Note that lexical stems such as *reep* 'bar' do not realize the functional head. If they realized the functional head, they would be in complementary distribution with the diminutive, contrary to fact (*chocoladereepje* 'small chocolate bar'). The preference for the unit reading for *chocoladereep* 'chocolate bar' thus stems from two ingredients: (i) a null morpheme which realizes the unit° head, (ii) the very high degree of encyclopedic boundedness of nouns such as *reep* 'bar' (which will be discussed in section 6).

size marking. In this section I show that Afrikaans patterns exactly like Dutch in the derivation of mass, kind and unit readings[18].

3.1 Afrikaans kind readings

As in Dutch, Afrikaans NPs with mass readings lack number marking (43). Once number marking is added to a noun which is traditionally seen as a mass noun, a count kind reading is derived (44).

43) Ons drink ongelooflik baie **bier** saam.
we drink incredibly much beer together
'Together we drink incredible amount of beer.'

44) Die keuse van bier-e in New Zealand is ongelooflik.
the choice of beer-PL in New Zealand is incredible
'There is an incredible choice in beers in New Zealand.'

The data thus suggest that Afrikaans kind readings have the same structure as Dutch ones, viz. (45).

45) [$_{DP}$ [$_{D'}$ [$_{DivP}$ [$_{Div'}$ bier-e$_{(Div)}$ [$_{NP}$ [$_{N'}$ ~~bier~~]]]]]]

3.2 Afrikaans unit readings

If we do not only add number marking, but also a diminutive, the result is a unit reading (46).

46) Die bier-tjie-s word warm.
the beer-DIM-PL become warm
'The beers are turning warm.'

The data thus suggest that also the unit reading in Afrikaans has a similar structure as the Dutch one, viz. (47).

47) [$_{DP}$ [$_{D'}$ die [$_{DivP}$ [$_{Div'}$ bier-tjie$_{(Size)}$-s$_{(Div)}$ [$_{SizeP}$ [$_{Size'}$ ~~bier-tjie~~$_{(Size)}$ [$_{NP}$ [$_{N'}$ ~~bier~~]]]]]]]

[18] I am grateful to Theresa Biberauer for the Afrikaans data.

4 Kinds and units in German

In this section I extend the analysis to Standard German. I show that German kind and unit readings have the same blueprint, but that German has an unsplit Div/Size° complex, whereas Dutch and Afrikaans display a split structure in which Div° and Size° head separate projections (cf. Thráinsson 1996; Thráinsson and Bobaljik 1998 and Giorgi and Pianesi 1997).

4.1 Standard German kind readings

As in Dutch and Afrikaans, number marking can be used to derive kind readings from mass readings in German. (48) shows a mass reading, (49) shows a kind reading.

48) Es gibt Bier.
there is beer
'There is beer.'

49) Dies sind zwei verschiedene Bier-e:
these are two different beer-PL
ein Lambik und ein Pils.
a lambic and a lager
'These are two different kinds of beer: a lambic and a lager.'

(48) lacks number marking. Consequently, it is interpreted as a mass reading. (49), on the other hand, is marked for plural. As a result, a kind reading is derived. This is illustrated in (50).

50) [$_{DP}$ [$_{D'}$ [$_{DivP}$ [$_{Div'}$ Bier-e$_{(Div)}$ [$_{NP}$ [$_{N'}$ ~~Bier~~]]]]]]

4.2 Standard German unit readings

There are two ways to arrive at a German unit reading. Firstly, they can be derived by means of the diminutive, as in Dutch and Afrikaans. Both (51) and (52) are examples of such readings. These NPs are ambiguous between singular and plural readings.

51) ein / zwei Bier-chen
one / *two* *beer-DIM*
singular: ‘one glass of beer’
plural: ‘two glasses of beer’

52) ein / zwei Bier-lein
one / *two* *beer-DIM*
singular: ‘one glass of beer’
plural: ‘two glasses of beer’

However, these examples differ from their Dutch and Afrikaans counterparts. German diminutives never take number marking[19,20], regardless of the diminutive morpheme that is being used (cf. (53) – (54)).

53) * Bier-chen-s
beer-DIM-PL

54) * Bier-lein-e
beer-DIM-PL

Admittedly, for the diminutive morpheme *–chen* the absence of plural marking is not unexpected from a phonological point of view. Masculine and neuter nouns which end in the rhyme *–en*[21] generally do not show overt plural marking, as can be seen in (55) – (56).

55) das Waschbecken
the.SG.NEUTER *washbasin*
‘the washbasin’

56) die Waschbecken
the.PL *washbasin*
‘the washbasins’

However, if only phonology were be at play in these cases, we would expect the plural marking *–e* for the diminutive allomorph *–lein*, on a par with other

[19] An anonymous reviewer points to the fact that some diminutives get an umlaut when they refer to plurals, which they lack in the singular, e.g. *Hundchen* ‘small dog’ vs. *Hündchen* ‘small dogs’. As a consequence, the question arises if this umlaut realizes plural marking. I do not think the umlaut realizes plural marking. Instead, I believe it is an instance of stem allomorphy. Evidence comes from the fact that the same umlaut also appears in derivations (e.g. *Hündin* ‘bitch’). This is seen as the hallmark of stem allomorphy (Booij 2002). As far as I know, the trigger of stem allomorphy is not yet understood. Therefore, I fail to answer why such stem allomorphy should occur and what it should indicate.

[20] Several German dialects, most notably Austrian German, do not pattern with Standard German but are, mutatis mutandis, similar to Dutch in their structure of kind and unit readings (cf. Wiltschko 2006 on the different behavior of Standard German and Austrian German diminutives).

masculine and neuter nouns which have *–ein* in the rhyme, as is shown in (57) – (64).

57) das Schwein
the.SG.NEUTER pig
'the pig'

58) die Schwein-e
the.PL pig-PL
'the pigs'

59) das Bein
the.SG.NEUTER leg
'the leg'

60) die Bein-e
the.PL leg-PL
'the legs'

61) der Stein
the.SG.MASC stone
'the stone'

62) die Stein-e
the.PL stone-PL
'the stones'

63) der Wein
the.SG.MASC whine
'the whine'

64) die Wein-e
the.PL whine-PL
'the whines'

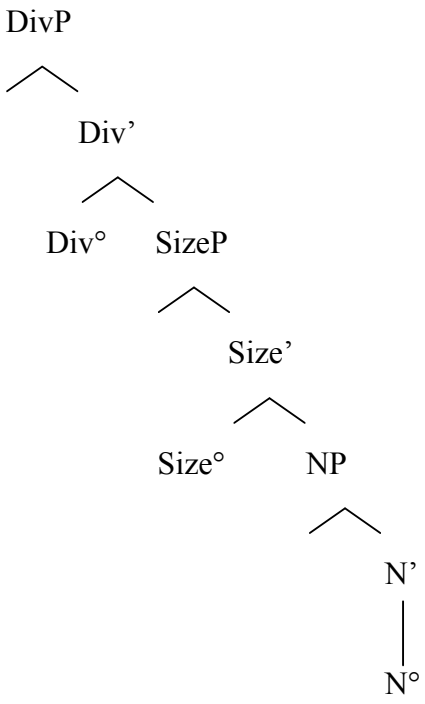
The words in (57) – (64) have the same rhyme as the diminutive in (54). These nouns, however, show overt plural marking by means of the plural morpheme *-e*, unlike the diminutive in (54). These data indicate that the absence of plural marking for diminutivized nouns with *–lein* is not due to phonological restrictions.

I take the fact that number marking and size marking are in complementary distribution to be positive morphological evidence that Div° and Size° in German occupy the same syntactic head (cf. Thráinsson 1996). In other words, whereas

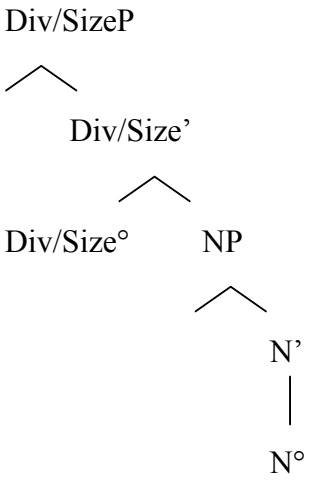
[21] The specific choice of the plural morpheme is mainly based on the gender and the rhyme of the noun in German.

Dutch and Afrikaans have a split structure as in (65), German has the unsplit structure in (66).

65) Split structure



66) Unsplit structure



In German the DivP and the SizeP are collapsed into one projection. Consequently, the diminutive and the plural morphemes are in competition for insertion at the same position, hence their complementary distribution[22].

The second way to derive unit readings in German is by adding number marking, instead of a diminutive. This is shown in the example below.

67) Bier-e
beer-PL
'glasses of beer'

Note that the unit reading that is derived in this way, i.e. by means of number marking, is homonymous with the kind reading in (49); number marking can thus be used both to derive kind and unit readings.

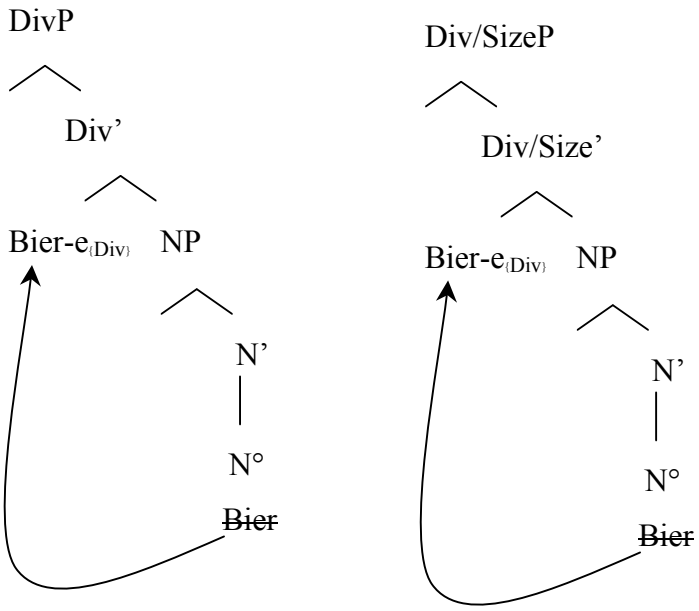
The fact that unit readings can be realized both by number marking and size marking in German follows from the way phonological material is inserted. Vocabulary insertion proceeds as follows. The Div/Size° complex is marked for the features [Div] and [Size]. Consequently, both number marking and the diminutive can realize this head, as both are specified for a subset of the features of the Div/Size complex.

68) */–e/* ↔ [Div]
/–chen/ ↔ [Size]

[22] At least for German, I assume that the indefinite article merges in the position where cardinals merge, above DivP.

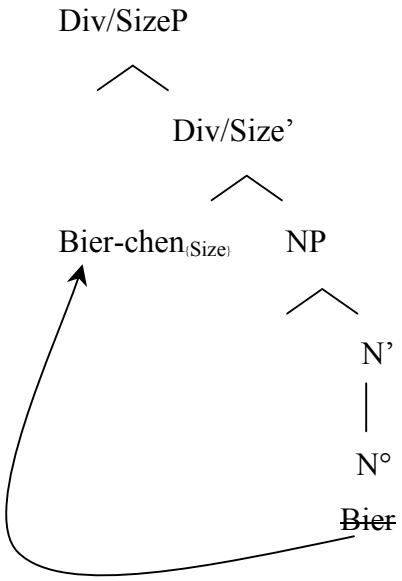
Note that the German unit reading which is realized by means of number marking will be homonymous with kind readings at the surface. The different readings still result from a featural difference, though. The pluralized noun which refers to kind readings, only has the feature [Div] in its structure, the one which refers to units has both features in its structure, but [Size] is not realized overtly. Both structures are illustrated in (69).

69) kind reading unit reading



Note also that the diminutive morpheme will only be inserted in unit readings. It realizes the feature [Size] and the unit reading is the only structure which contains this feature. The presence of this size morpheme, however, blocks the additional insertion of a number morpheme as they are in competition for the same head. As a result, the readings remain underspecified for the exact nature of number. It follows that the NP is ambiguous between a singular and a plural reading. This structure is illustrated in (70).

70) Unsplit structure: unit reading



5 Corroborating evidence: another Size morpheme

In this section I argue that Dutch, Afrikaans and German have a designated morpheme to express the feature [Size] in cases of NP ellipsis. For Dutch and Afrikaans this is the noun *stuk*, for German *Stück*. In all three languages this noun means 'piece' in many contexts, but it adopts the denotation 'specimen' in the elliptical structures under discussion. I use the Dutch and Afrikaans data to illustrate the gist of the analysis and the precise derivation of the elliptical structure. The data from both languages are presented together in one section as they are similar. The German data differ from the Dutch and Afrikaans ones. They support the unsplit functional structure I proposed in section 4.2 and are therefore presented in a separate section.

5.1 *Stuk* in Dutch and Afrikaans

In this section I show that the Dutch and Afrikaans noun *stuk* 'specimen' does not take a diminutive and only occurs in elliptical contexts. I argue that this noun instantiates the Size° head in cases of NP ellipsis.

There are two homonymous nouns *stuk* in Dutch and Afrikaans. The examples in (71) – (74) show the first one. It can be translated as 'piece'. In Dutch it takes the plural morpheme *–en*, as is shown in (72), in Afrikaans *–e*, as is illustrated in (73). It can take a diminutive in both languages. (71) shows this for Dutch, (74) for Afrikaans. I will refer to this noun as $stuk_1$.

71) Het is nog geen compleet artikel, [Dutch]
it is yet no complete article
het is nog maar een **stuk$_1$ (-je)**.
it is yet but a piece(-DIM)
'It is not yet a complete article, it is only a (little) piece.'

72) Ik heb al twee **stuk$_1$-ken** gegeten. [Dutch]
I have already two piece-PL eaten
'I already ate two pieces.'

73) Ek het alreeds twee **stuk$_1$-e** geëet. [Afrikaans]
I have already two piece-PL eaten
'I already ate two pieces.'

74) Ek het alreeds een **stuk$_1$(-ie)** geëet. [Afrikaans]
I have already one piece(-DIM).SG eaten
'I already ate one (small) piece.'

The examples below, on the other hand, show the second use of *stuk*, henceforth *stuk$_2$*, in Dutch (75) and Afrikaans (76).

75) A: Hoeveel bananen heb je gekocht? [Dutch]
how.many bananas have you bought
B: Ik heb twee **stuk$_2$-s** gekocht.
I have two specimen-PL bought
'How many bananas did you buy? I bought two specimens.'

76) A: Hoeveel piesangs het jy gekoop? [Afrikaans]
how.many bananas have you bought
B: Ek het twee **stuk$_2$-s** gekoop.
I have two specimen-PL bought
'How many bananas did you buy? I bought two specimens.'

In this use the noun *stuk* is most accurately translated as 'specimen', i.e. it resists the part-whole interpretation typically associated with 'piece' and it only refers to individual units. Furthermore, it takes a different plural morpheme *–s*[23,24,25] and it

[23] An anonymous reviewer points to an alternative analysis according to which the *–s* is not a plural morpheme for *stuks*. S/he gives the argument that *één stuk* 'one piece' is not acceptable in the specimen reading, whereas *één stuks* 'one piece-S' is. Apparently, there is speaker variation. Many informants do not like *één stuks* 'one piece-S', whereas they accept één stuk 'one piece' in the specimen reading. Nevertheless, there appears to be variation. My analysis corresponds to the analysis in which the *–s* is treated as a plural morpheme. It can be maintained, however, under the assumpption that the *–s* is not a plural morpheme. One has to assume that *stuks* can take another *–s* as a plural morpheme, which is then invisible because of the phonological process of degemination. Under this assumption, we can maintain the same structure for the specimen reading for all speakers. I find this a desirable result. The question then remains what the nature of the *–s* is if it is not a plural marker to some speakers. The reviewer suggests it is a residue of an ancient genitive. I am reluctant to adopt this proposal, as the oldest examples of *stuks* that I have found in the *Digitale Bibliotheek voor de Nederlandse Letteren*

does not take a diminutive. Example (77) illustrates the illicitness of the diminutive for Dutch, (78) for Afrikaans.

77) * Ik heb twee $stuk_2$-je-s gekocht.[26] [Dutch]
I have two specimen-DIM-PL bought
Intended meaning: 'I bought two specimens.'

78) * Ek het twee $stuk_2$-ie-s gekoop. [Afrikaans]
I have two specimen-DIM-PL bought
Intended meaning: 'I bought two specimens.'

Note at this point that the diminutive is fully productive in Dutch and Afrikaans, i.e. all nouns in both languages can take a diminutive morpheme. It attaches easily, for example, to nouns denoting large objects, as in examples (79) – (80), to measure words, as in (81) – (82) and to abstract nouns (83) – (84).

79) die toren-tje-s in Dubai [Dutch]
those tower-DIM-PL in Dubai
'those towers in Dubai' (expresses contempt)

80) die torin-kie-s in Dubai [Afrikaans]
those tower-DIM-PL in Dubai
'those towers in Dubai' (expresses contempt)

81) een kilo-tje appelsienen [Dutch]
a kilo-DIM oranges
'a kilo of oranges'

82) 'n kilo-tjie lemoene [Afrikaans]
a kilo-DIM oranges
'a kilo of oranges'

83) een leugen-tje [Dutch]
a lie-DIM
'an innocent lie'

84) 'n leuen-tjie [Afrikaans]
a lie-DIM
'an innocent lie'

'Digital Library for Dutch Literature' corpus only stem from the 18th century, a period in which the Dutch case system was already in decline.

[24] Afrikaans does not allow for *$stuk_2$* to occur in singular NPs, neither as *stuks*, nor as *stuk*. It is not clear to me what causes this restriction.

[25] Afrikaans allows for the omission of the *–s* in case *$stuk_2$* refers to livestock. I do not know what causes this idiomatic use.

[26] The choice of the plural morpheme here is not determined by the noun as Dutch diminutives always take an *–s* as a plural morpheme.

In the light of examples (79) – (84) it is highly unexpected that *stuk*$_2$ cannot get a diminutive morpheme. I therefore propose that this noun is an instantiation of Size°[27]. From such a perspective it is not surprising that the diminutive, another realization of Size°, is incompatible with *stuk*$_2$: the two elements are in competition for the same syntactic position.[28] Moreover, this analysis allows us to understand why *stuk*$_2$ refers to a whole specimen; this denotation comes from the feature [Size][29].

Under this analysis we predict that *stuk*$_2$ cannot be used to refer to kind readings. Recall that the kind reading is incompatible with the [Size] feature (cf. section 2.3). Hence, if *stuk*$_2$ expresses this feature, we expect the kind reading to be excluded. This prediction is indeed borne out. This is shown in (85) for Dutch and in (86) for Afrikaans.

85) A: Hoeveel bier-en heb je bestudeerd voor je thesis over gist?
how.many beer-PL have you studied for your thesis on yeast
B: *Ik heb twee stuk-s bestudeerd.
I have two piece-PL studied
Intended meaning:
A: How many kinds of beer did you study for your dissertation on yeast?
B: I studied two kinds of beer.

86) A: Hoeveel bier-e het jy bestudeer vir jou tesis oor gis?
how.many beer-PL have you studied for your thesis on yeast
B: *Ek het twee stuk-s bestudeer
I have two piece-PL studied
Intended meaning:
A: How many kinds of beer did you study for your dissertation on yeast?
B: I studied two kinds of beer.

---

[27] Several reviewers raise the question whether if the measure word in direct partitive constructions also realizes a functional head in the noun's infectional domain. (Direct partitive constructions are constructions in which two nouns that are in a partitive realtion are juxtaposed without the intervention of an intermediate preposition, e.g. *een glas water* 'a glass of water' (Vos 1999, Van Riemsdijk 1998:12). Van Riemsdijk (1998:15) notes that direct partitive constructions constitute single projections, althoug the measure noun, i.e. the first noun, retains more of its syntactic independence than would be expected from a functional head. Indeed, I do not think it is plausible that the measure noun realizes a functional head such as Div° or Size°. The main argument for analysing *stuk* as a realization of Size° is the fact that it is in complementary distribution with the diminutive. Measure nouns in direct partitive constructions, however, are not in complementary distribution with nominal inflectional markers. Moreover, it seems that the measure noun and the second noun both can get inflection, e.g. *een doosje luciferretjes* 'a small box of small matches' (Lit. a box.DIM.PL of match.DIM.PL). In this respect, the measure noun differs from *stuk*. Moreover, note that *stuk* does not trigger a partitive reading. Consequently, I do not think *stuk* and direct partitive constructions should be analyzed on a par. I think that the relation between nominal inflection and partitive constructions is not entirely understood and deserves further research.

[28] Wiltschko (2006) proposes that many nouns that participate in partitive constructions (her classifiers) occupy the same position as the diminutive in German. I do not follow her approach.

[29] The fact that *stuk* realizes the feature [*Size*] may come as a surprise; it does not express smallness or bigness. In De Belder (to appear) I am very explicit about the precise semantics of the Size head: I think it expresses both a measure function and smallness. Although *stuk* may not express smallness, I propose it expresses the same measure function.

A further property of the noun *stuk₂* is that it occurs exclusively in elliptical contexts[30]. The Dutch example in (87) and the Afrikaans one in (88) show that an example with both *stuk₂* and an overt noun is ungrammatical.

87) * Ik heb twee stuk$_2$(-s) banaan(-en) gekocht. [Dutch]
I have two specimen-PL banana(-s) bought

88) ?? Ek het twee stuk$_2$(-s) piesang(-s) gekoop. [Afrikaans]
I have two specimen-PL banana(-s) bought

In the absence of the second noun, however, it is grammatical in both languages, as can be seen in (89) and (90).

89) Ik heb twee stuk$_2$(-s) gekocht. [Dutch]
I have two specimen-PL bought
'I bought two specimens.'

90) Ek het twee **stuk$_2$-s** gekoop. [Afrikaans]
I have two specimen-PL bought
'How many bananas did you buy? I bought two specimens.'

I propose that (89) and (90) are the elliptical versions of (87) and (88), respectively[31]. Evidence in favor of this analysis comes from nouns that combine with a restrictive PP modifier. Lobeck (1995:43) points out that such modifiers can remain outside of the ellipsis site. In this way, a PP modifier can be present in the elliptical sentence, although the NP that combines with it, is elided. She gives the following example:

91) John's presentation on urban development was virtually ignored because [$_{NP}$Mary's [e] on arms control] was so much more interesting.

Lobeck proposes that NP-ellipsis in these cases operates on an intermediate projection and that the modifier is adjoined to an N' above the one that is elided. Now consider the following examples.

---

[30] A remarkable exception to this rule in Dutch is the combination of *stuk₂* with collective nouns, such as *twee stuks vee* 'two pieces of livestock'. At this point, I do not understand why this should be the case. A reviewer points to some further examples which do not seem to be elliptical, such as *twee stuks kandelaars* 'two chandeliers' (Litterally, *two pieces chandeliers)*. I find these examples highly marginal. I do not exclude, however, that *stuk* may have a very different syntactic use for some speakers from the one under discussion. More specifically, it may be the case that these examples should be analyzed as partitives. As such, these examples are orthogonal to the discussion at hand.

92) een medaille voor / *van tennis [Dutch]
a medal for / of tennis
'a medal for tennis'

93) België heeft vier medailles voor tennis gewonnen [Dutch]
Belgium has four medals for tennis won
en twee **stuk-s** voor zwemmen
and two specimen-PL for swimming
'Belgium obtained four medals for tennis and two for swimming.'

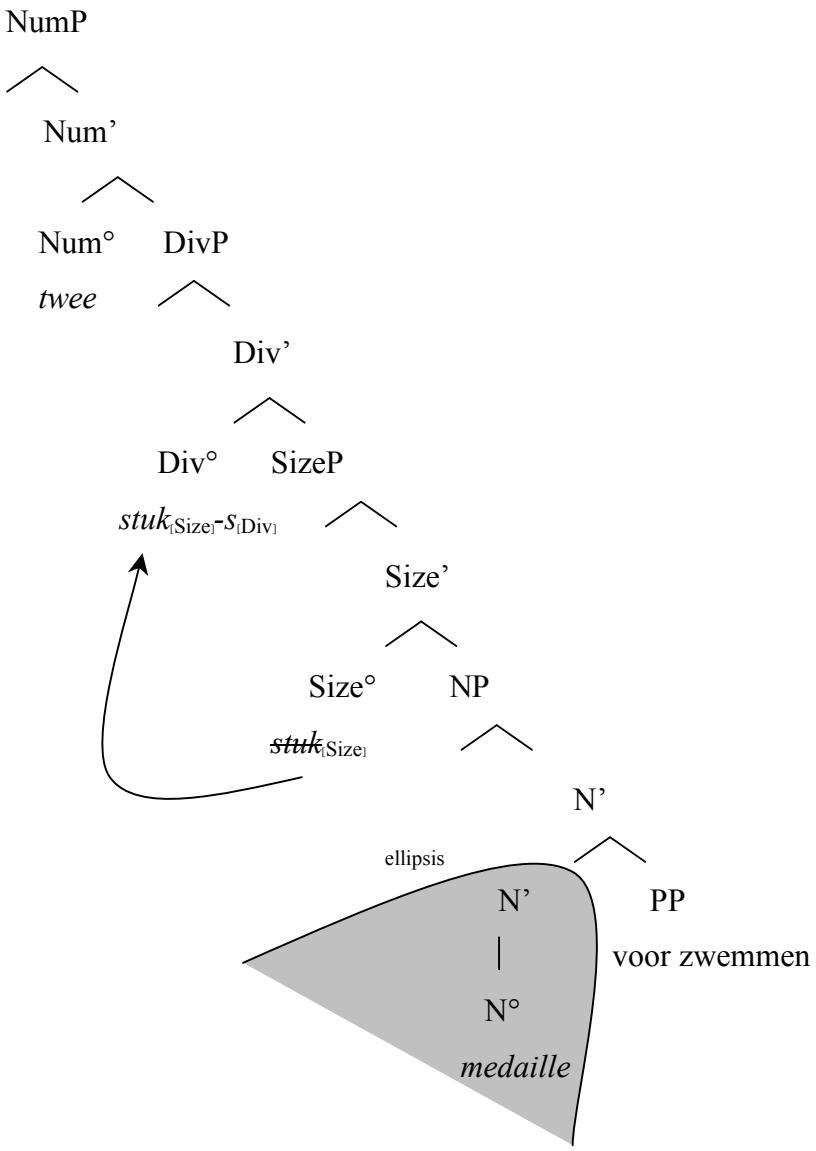
94) 'n medalje vir tennis [Afrikaans]
a medal for tennis
'a medal for tennis'

95) Suid-Afrika het vier medaljes vir tennis gewen [Afrikaans]
South-Afrika has four medals for tennis won
en twee **stuk-s** vir swem
and two specimen-PL for swimming
'South-Afrika obtained four medals for tennis and two for swimming.

The Dutch example (92) and the Afrikaans one in (94) show that the noun *medaille/medalje* 'medal' takes the preposition *voor/vir* 'for' to introduce its modifier. If we compare them to (93) and (95), it becomes clear that the latter examples instantiate NP ellipsis: it is not the noun $stuk_2$ that selects the PP modifier, but the elided NP.

[31] Dutch, Afrikaans and German all have also other forms of NP-ellipsis constructions, which do not use *stuk*. I believe they should be assigned a different analysis. As such, they are orthogonal to the discussion.

96)



In example (91), it is the possessor *Mary's* that licenses the ellipsis of its NP complement. Lobeck claims that functional heads that are specified for a feature (in this case [+Poss]) can license the ellipsis of their complements. Analogously, I propose that *stuk*$_2$ licenses the ellipsis of the N'. *Stuk*$_2$ is an instantiation of the functional head Size° and it is specified for a feature, viz. [Size][32]. It is therefore able to license the ellipsis. Note that the presence of *stuk*$_2$ in Size° also blocks N°-to-Size°-movement, thus forcing the noun to remain in the ellipsis site. The

[32] A possible analysis for the specific elliptical construction at hand is along the lines of Llombart-Huesca's (2002) proposal for NP ellipsis with *one*. She suggests that *one* realizes the head which hosts number marking. Similarly, it can be proposed that *stuk(s)* realizes the size head. I would like to thank an anonymous reviewer for this suggestion.

structure of (93) is given in (96). (I assume the exact same structure for the Afrikaans NP.)

To recapitulate, the noun *stuk*$_2$ 'specimen' instantiates Size°. It occurs in contexts of NP-ellipsis that operate on an intermediate N'.

5.2 *Stück* in Standard German[33]

In this section I show that the Standard German[34] noun *Stück* behaves like its Dutch and Afrikaans counterparts in most respects, but that it differs crucially in the way we expect according to the proposal above (see section 4.2) according to which Standard German collapses the features [Div] and [Size] on one head. The meaning of *Stück* is 'piece', but in cases of NP ellipsis it refers to specimens because it occupies the Size° head. Recall that in section 4.2 I proposed an unsplit Div°/Size° complex for German because plural marking (the overt realization of Div°) and the diminutive (the overt realization of Size°) are in complementary distribution. We therefore expect that if the German noun *Stück* occupies the same position, viz. Size°, this noun cannot combine with a diminutive or plural marking. I will show that this expectation is indeed borne out, thus providing further evidence for an unsplit Div°/Size° complex in Standard German.

In many contexts the German noun *Stück* refers to a piece, as in (97). In this reading this noun can be pluralized, as is illustrated by (98) or can be combined with a diminutive, as can be seen in (99).

97) Ich aß ein Stück Kuchen.
I ate a piece pie
'I ate a piece of pie.'

98) Ich habe schon zwei Stück-e gegessen.
I have already two piece-PL eaten
'I already ate two pieces.'

99) Ich habe schon ein/zwei Stück-chen gegessen.
I have already one/two piece-DIM eaten
'I already ate one piece/ two pieces.'

---

[33] I would like to thank Eva Zimmermann for providing me with the necessary data for this section. I would also like to thank Anneleen Vanden Boer, Jan Ceuppens and Karen De Clercq for their help on German data.

[34] I restrict myself to the discussion of Standard German in this section. I would like to point out that German seems to be tremendously rich when it comes to microvariation in this domain. This became clear from the many questionnaires I got back from Eva Zimmermann and Alexander Jahraus (Standard German), Eva Dobler (Austrian German), Patrick Schulz (Erzgebirgisch) and Philipp Weisser (Pfälzisch). A discussion of this variation goes far beyond the scope of this article, but I believe that a further exploration of this field in German dialects would be a worthwile project.

The same noun occurs in elliptical contexts in which it gets interpreted as a specimen. Again, the occurrence of ellipsis can be concluded from preposition selection. As can be concluded from (100), it has to be the elided noun *Medaille* 'medal' that selects the preposition in (101).[35]

100) eine Medaille für Tennis
a medal for tennis
'a medal for tennis'

101) Deutschland hat vier Medaillen errungen:
Germany has four medals obtained
zwei Stück für Tennis und
two specimen for tennis and
zwei Stück für Schwimmen.
two specimen for swimming
'Germany obtained four medals: two for tennis and two for swimming.'

For a more detailed discussion of this elliptical structure the reader is referred to section 5.1 in which similar cases for Dutch are discussed. From that discussion the reader can conclude that *Stück* has to occupy a functional position specified for a feature in order to license the NP ellipsis of its complement, viz. *Medaille* 'medal'. As I did for Dutch, I propose that this functional position is Size° and this feature [Size].

In this specimen reading *Stück* cannot take plural marking or a diminutive. This can be concluded from example (102).

102) zwei Stück/*Stück-e/*Stück-chen für Tennis
two piece/piece-PL/piece-DIM for tennis
'a medal for tennis'

The illicitness of plural marking and the diminutive in this context is clearly not due to phonological or morphological restrictions; in the piece readings in (98) and (99) the same noun does take these morphemes. I therefore conclude that these facts follow from structural restrictions. In section 4.2 I proposed that German has an unsplit Div°/Size° head and that the diminutive and plural marking are in competition for this same head and therefore never cooccur in German. In

this section I also proposed that the noun *Stück* 'specimen' is yet another realization of this same head Size°. Consequently, the diminutive morpheme, number marking and the noun *Stück* are in competition for the same syntactic position. Therefore they never cooccur. As such, the analysis of the noun *Stück* 'specimen' is corroborating evidence for an unsplit Div°/Size° complex for Standard German.

6 Encyclopedia

In section 1.2 it was argued that nouns are not marked in the lexicon as count or mass and that countability effects are rather the effect of syntax. I have adopted this approach and I have argued that even the kind-unit distinction is syntactic. As a result, all nouns can enter all readings. Nevertheless, there seems to be a real intuition that the example in (103) is more marked than the one in (104).

103) There is dog all over the wall. [mass]
104) There is blood all over the wall. [mass]

The question then naturally arises where this difference comes from if it is not a lexical feature which distinguishes them, as we are assuming. I would like to address this issue as an afterthought. This section therefore discusses what differentiates the concepts *dog* and *blood*.

Nouns that refer to animates and things typically get unit readings. In the same vein, the unit reading is more salient than the kind reading for animates, as is illustrated by the contrast in (105).; the unit reading in (105a) is more salient than the kind reading in (105b).

105) three dogs
a. Fido, Laika and Lassie [unit]
b. the Jack Russell, the Parson Terrier and the poodle [kind]

The high degree of compatibility between unit readings and animates and things stems from the fact that we have strong encyclopedic knowledge on what constitutes a unit for these concepts. In other words, we have extra-linguistic knowledge on what individual cats, laptops, trains and trees look like. With the

[35] Some informants prefer another preposition, such as *in* 'in'. All informants, however, choose the same preposition for

same ease we identify two cats standing next to each other as two individual cats and not as one big heap of 'catstuff'. We know where one individual cat stops and where the other one begins. I will say that these concepts have a high degree of encyclopedic boundedness. In other words, encyclopedia (cf. Harley and Noyer 1999 and Marantz 1995) contains information on what constitutes the conventional or natural unit for that given concept. Just like encyclopedia may provide information on what counts as a single instantiation for certain concepts, it fails to provide this information for other concepts. There is no convention on what constitutes one instance of sweat or blood, for example. I will say that these concepts have a low degree of encyclopedic boundedness.

The competence to recognize a unit is real, but extra-linguistic. Hence, it is irrelevant for the computational system. Evidence for this claim comes from the fact that this competence is not even exclusively human. Research in comparative psychology has shown that elephants, rhesus monkeys, pigeons, lions, dolphins, parrots, rats and many more animals can count items (Irie-Sugimoto 2009; Brannon and Terrace 2000; Hirai and Jitsumori 2009 and Pepperberg 2006). Parrots, pigeons and chimpansees even performed simple summation tasks succesfully (Olthof and Roberts 2000; Pepperberg 2006 and references therein). Obviously, this implies that they understand the more basic notion of what counts as one single instantiation of an object, i.e. what constitutes a unit. This shows that the notion of a unit is also understood by animals. It therefore cannot be a purely linguistic notion. Instead, it has to be part of our broader cognition. I suggest that our linguistic competence does not make the distinction between stuff that come in units and things that do not.

Having established that the notion of the unit resides in our broader cognitive capacities, the assumption that the unit also resides in the lexicon now seems superfluous, if not undesirable. The view that encyclopedic knowledge on this issue suffices and should not be complemented by lexical features fares better than the traditional view that the mass count distinction is mostly a lexical notion. More specifically, it seems to be a fundamental property of encyclopedia that it copes better with flexible uses of nouns than linguistic features do.

Under traditional assumptions mass nouns can be distinguished from count nouns; nouns carry the feature +/- count. This view has the disadvantage of being

---

(100) as for (101).

all or nothing; a noun is either mass or count. The binary distinction does not allow for intermediate positions. The idea that knowledge on boundedness resides in encyclopedia accounts for the fact that encyclopedic boundedness seems to be ordered on a scale (Rothstein 2008 on a mass-count scale). Let us take a look at this scale. At the upper end of the scale we find animates and inedible things. For these concepts we have got a clear knowledge on which portion realizes one instance. We are surprised when we ignore the notion of the individual when talking about animates, as the mass reading in example (103) shows. Conversely, we lack this knowledge for most materials. They have a very low degree of encyclopedic boundedness. As such, they can be found at the lower end of the scale. Food and animals we consume are often in the middle; we talk as easily about 'cake' and 'chicken' as masses as about 'a cake' and 'a chicken'.

Assigning boundedness to encyclopedia and not to the lexicon also predicts correctly that nouns can be used flexibly. More specifically, it seems to be a fundamental property of encyclopedic knowledge that it is far more flexible than the interpretation of linguistic features. Take for example 'sugar'. We know it is a granulary substance, that it is sold in packs and that we add spoonfuls of it to a batter. Based on this knowledge, we predict that sugar is a mass noun under the traditional view. Indeed, it gets mass readings, as is illustrated in (106).

106) There is a lot of sugar in the ice cream. [mass]

Nevertheless, in the context of drinking coffee, we know that the conventional unit of sugar is a cube. This predicts that 'sugar' can also be used in count unit contexts. This is equally borne out.

107) coffee with milk and two sugars [unit]

Furthermore, we know that there exist certain varieties of sugar, such as fructose and glucose. Indeed, 'sugars' can also refer to kinds of sugar. Under the view of encyclopedical boundedness, we do not need to characterize sugar as mass or countable. We can insert sugar freely in both syntactic mass and count contexts. We can trust that when we use it in a count reading, encyclopedia will provide the necessary information on what constitutes the conventional unit for the concept under discussion. Conversely, encyclopedia will be silent about this knowledge in

mass and kind contexts, i.e. when it is irrelevant. When ‘sugar’ is used in a mass reading, we can ignore our knowledge on sugar cubes. Similarly, when ‘dog’ is used in a kind reading, we can ignore our knowledge on what constitutes an individual dog. Ignoring linguistic features, on the other hand, is more complex. One needs to assume multiple lexical items or an extra apparatus to override the features or to change their values. No such approach is needed on the account advocated here.

I have discussed the fact that encyclopedic knowledge can be ignored. As a result, items with a high degree of enyclopedic boundedness can occur in kind and mass readings. Note that the reverse does not hold necessarily. In order for a concept with a low degree of encyclopedic boundedness to occur as a unit, we need knowledge on what constitutes such a unit. It is not obvious that such knowledge can be provided. Whereas encyclopedic knowledge on natural or conventional untis can be ignored straightforwardly, it is not clear if it can be created. For example, in order to talk about a unit of sweat, we need to know what a natural or conventional unit of sweat is. However, if neither nature nor convention provides this knowledge, how should we interpret or refer to such a unit? Therefore, we do not expect concepts with a low degree of encyclopedic boundedness in unit readings, unless the problem of interpretation is in some way circumvented. An example of this has been discussed in this paper. We have seen that the diminutive can come at the rescue in Germanic languages to assign a default unit interpretation to concepts with a low degree of enyclopedic boundedness. The default interpretation for the diminutive is ‘a unit of some square or cubic centimeters consisting of the stuff the noun refers to’. As such, the diminutive helps assigning a unit interpretation to concepts with a low degree of enyclopedic boundedness. It now follows that concepts with a high degree of encyclopedic boundedness may occur more easily as a unit reading without the diminutive than concepts with a low degree of encyclopedic boundedness. The former concepts do not rely on the diminutive to be interpretable as a unit.

Note that the availability of knowledge on what constitutes a unit may vary. Recall that the encyclopedic notion of a unit depends on knowledge provided by nature or convention. We expect that the conception of natural units is more or less universal; it is unlikely that in some languages two cats are considered as one

unit[36]. It is not surprising, however, that there exists some variation in the conception of conventional units. In Dutch, for example, one cannot use *een chocolade* 'a chocolate' as a unit reading. I believe this is due to the fact that there is no clear convention on which portion of chocolate would constitute a prototypical unit of chocolate. In Norwegian, however, such a convention does exist. As a result, *en sjokolade* 'a chocolate' refers to a bar of chocolate in this language. Note that under this approach *een chocolade* would not be an ungrammatical unit reading in Dutch, it is simply not used and therefore uninterpretable. It has been noted before that languages do not use all structures which are in fact grammatical options. Barbiers (2006) calls such structures unrealized variants. These are structures which are grammatical in a given language, but which are not used or used only in certain dialects or registers. Such structures will disappear from a child's language. In other words, convention determines language use.

Summing up, our cognitive capacities are able to discriminate units. Moreover, it is reasonable to suppose that we have a fair knowledge on which concepts normally come in the shape of a unit; a dog is more likely to show up as an individual than as mass stuff. The reverse holds for blood. I called this piece of knowledge encyclopedical and I argued that it gives rise to the oddness of the example 'There is dog on the wall'. One is surprised that the dog is treated as mass stuff in this example. It is important to note that we can now account for the markedness of this example without relying on a lexical feature [count] for 'dog'. I further argued that our capacity to discriminate units in our cognition does not stem from our language faculty. The consequence is that linguistics is probably not the appropriate science to account for the salience of the unit for certain concepts and the oddness of the 'There is dog on the wall' example which results from it.

[36] There is some variation, though. In Hungarian, for example, one pair of eyes is considered as one unit, whereas one eye is only half a unit: *fél szem* 'an eye' (Literally: half eye).

7 Conclusion

In this article I have proposed a fine-grained morphosyntactic analysis of countability phenomena in Dutch, Afrikaans and German. I have shown that countability does not only rely on a distinction between mass and count readings. Instead, I have shown that within the count readings a further distinction should be made between kind and unit readings. We have seen that these semantic differences go hand in hand with morphological properties: mass readings allow for neither number marking nor size marking, kind readings allow for number marking, but not for size marking and for unit readings both number and size marking are licit. I proposed that the Dutch, Afrikaans and German diminutive and the Dutch, Afrikaans and German nouns *stuk/Stück* 'specimen' are overt realizations of [Size].

I further showed that Dutch and Afrikaans have a split structure, whereas German has an unsplit Div/Size projection. This structural difference allows us to understand the various data and sheds light on linguistic variation. All three languages have the same featural blueprint, but they differ in the number of heads which get realized.

References

Barbiers, Sjef (2006) Er zijn grenzen aan wat je kunt zeggen. Oratio, June 1, 2006, Utrecht.

Bobaljik, Jonathan, and Höskuldur Thráinsson. 1998. Two heads aren't always better than one. *Syntax* 1: 37-71

Booij, Geert. 2002. *The morphology of Dutch*. Oxford: OUP.

Borer, Hagit. 2005. *In Name Only*. Oxford: OUP.

Brannon E.M., and H.S. Terrace. 2000. Representation of the numerosities 1-9 by rhesus macaques (Macaca Mulatta). *Journal of Experimental Psychology. Animal Behavior Processes.* 26: 31-49.

Carlson, Gregory. 1977. *Reference to kinds in English.* PhD Diss., University of Massachusetts.

De Belder, Marijke. To appear. On the distribution of pre-determiner universal quantifiers in Dutch. *Proceedings of the 39th Meeting of the North East Linguistic Society.*

De Belder, Marijke. 2009. On the features, heads and morphemes of Dutch nominal inflection. Paper presented at Atoms and Laws of the Noun Phrase, July 2-3, 2009, Utrecht.

De Belder, Marijke et al. 2009. On derivational and inflectional diminutives. Paper presented at the 40th North East Linguistics Society 40 (NELS 40), November 13-15, 2009, Cambridge (MIT).

Delsing, Lars-Olof. 1993. *The internal structure of noun phrases.* PhD Diss., University of Lund.

Doetjes, Jenny. 1997. *Quantifiers and selection: On the distribution of quantifying expressions in French, Dutch and English.* PhD Diss., Leiden University.

Giorgi, Alessandra, and Fabio Pianesi. 1997. *Tense and aspect: From semantics to morphosyntax*. Oxford: OUP.

Gleason, H.A. 1965. *Linguistics and English Grammar*. Toronto, Canada: Holt Reinhard Winston of Canada.

Halle, Morris, and Alec Marantz (1993) Distributed Morphology and the pieces of inflection. In *The view from Building 20*, eds. Kenneth Hale, and Samuel Jay Keyser, 111-176. Cambridge (MA): MIT Press.

Harley, Heidi, and Ralph Noyer (1999) State-of-the-Article: Distributed Morphology. *GLOT* 4.4: 3-9.

Hirai, Shin, and Masako Jitsumori. 2009. Counting absolute numbers of items, from 1 to 8, in pigeons. *Learning & Behavior* 37: 365-379.

Irie-Sugimoto, Naoko et al. 2009. Relative quantity judgment by Asian elephants (Elephas maximus). *Animal cognition* 12(1): 193-199.

Jackendoff, Ray, and Barbara Landau. 1992. Spatial language and spatial cognition. In *Languages of the mind*, author Jackendoff, Ray. Cambridge (MA): MIT Press.

Landau, Barbara et al. 1988. The importance of shape in early lexical learning. *Cognitive Development* 3: 299-321.

Llombart-Huesca, Amàlia. 2002. Anaphoric one and NP-ellipsis. *Studia Linguistica* 56(1): 59-89.

Lobeck, Anne. 1995. *Ellipsis: Functional heads, licensing and identification*. New York: OUP.

Marantz, Alec. 1995. Cat as a phrasal idiom: Consequences of late insertion in Distributed Morphology. MIT: Ms.

Marantz, Alec. 2009. Phases and Words. NYU: Ms.

Olthof, Anneke, and William A. Roberts. 2000. Summation of symbols by pigeons (Columba livia): The importance of number and mass of reward items. *Journal of Comparative Psychology* 114(2): 158-166.

Pelletier, Francis Jeffry. 1979. Non-singular reference: some preliminaries. In *Mass terms: some philosophical problems*, ed. Francis Jeffry Pelletier. Dordrecht: D. Reidel Publishing Company.

Pepperberg, Irene M. 2006. Grey Parrot (Psittacus erithacus) Numerical Abilities: Addition and Further Experiments on a Zero-Like Concept. *Journal of Comparative Psychology* 120 (1): 1-11.

Rothstein, Susan. 2006. Counting and the mass-count distinction. Paper presented at the Leiden Utrecht Semantic Happenings, December 4, 2008, Leiden.

Sigurdsson, Halldor Armann. 2006. Remarks on features. *WPSS* 77.

Steriopolo, Olga. 2008. Form and function of expressive morphology: A case study of Russian. PhD Diss., University of British Columbia.

Thráinsson, Höskuldur. 1996. On the (Non-)Universality of Functional Categories. In *Minimal Ideas. Syntactic Studies in the Minimalist Framework*, eds. Abraham Werner et al. Amsterdam: John Benjamins.

Vangsnes, Øystein Alexander. 2008. What kind of Scandinavian? On interrogative noun phrases across North-Germanic. *Nordic Journal of Linguistics* 31: 227-251.

Van Riemsdijk, Henk. 1998. Categorial feature magnetism: The endocentricity and distribution of projections. *Journal of Comparative Germanic Linguistics* 2: 1-48.

Van Riemsdijk, Henk. 2005. Silent nouns and the spurious indefinite article in Dutch. In *Grammar and beyond. Essays in honour of Lars Hellan*, eds. Mila Vulchanova et al. Oslo: Novus Press.

Vos, Riet. 1999. *The grammar of direct and indirect partitive constructions.* PhD Diss., Katholieke Universiteit Brabant.

Wiltschko, Martina. 2006. Why should diminutives count? In: *Organizing Grammar. Linguistic Studies in Honor of Henk van Riemsdijk*, ed. Hans Broekhuis. Berlin: Walter de Gruyter.

Zemach. 1970. Four ontologies. *Journal of Philosophy* 67(8): 231-247.