

Decomposing the Mass/Count Distinction
Evidence from languages that lack it
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1. Introduction

In this paper I wish to establish the claims summarized in (1).

- (1) Goals
 - a. I demonstrate that not all languages classify their nominals into mass and count nouns.
 - b. I argue that the grammaticized mass/count distinction is tied to a functional category which I identify as *nominal inner aspect*. A grammaticized mass/count distinction arises if nominal inner aspect is associated with the feature [\pm bounded].
 - c. I argue that in this domain, languages vary along two dimensions:
 - i) whether or not nominal inner aspect is available;
 - ii) which feature associates with nominal inner aspect

I make the case for each of these points as follows. I first establish in section 1 that the mass/count distinction is not universally grammaticized. In particular, I show that neither Blackfoot nor Halkomelem classify their nominals as either mass or count. This does however not mean that speakers of these two languages cannot distinguish between substances and individuals, respectively. Rather, it is the grammar that does not care about this distinction. To capture this source of language variation, I propose that we need to distinguish between ontological properties of nominals (whether they denote substances or individuals) and categorial properties of nominals (whether they are categorized as mass or count nouns).

I further argue that the categorial properties of the mass/count distinction may vary. Given the assumption that parametric variation is tied to functional categories (Borer 1983) it follows that the categorial aspect of the mass/count distinction must be linked to a specific functional category. This defines the second goal of this paper addressed in section 2. What is the identity of the functional category responsible for the categorial mass/count distinction. I adopt Rijkhoff's 1991 proposal according to which the relevant category is the nominal counterpart to Aktionsart, namely *Seinsart*. In line with recent ideas regarding the proper implementation of inner Aspect (Travis 2005, in prep), I propose that there is a functional category above n but below number which hosts a binary feature [\pm bounded] responsible for the grammaticized mass/count distinction in languages like English.

Finally, in section 3 I address the third goal of this paper, which is to determine the range of variation associated with the mass/count distinction. I argue that there are two dimensions of variation: i) whether or not inner aspect is available; and ii) whether or not [\pm bounded] is available to substantiate nominal inner Aspect (Asp). While in English it is, in Halkomelem and Blackfoot it is not. I further show that in Blackfoot inner aspect is associated with a different feature that serves to classify nominals, namely [\pm animate]. This supports the view of language variation argued for in Ritter & Wiltschko (2009) according to which languages can differ in the substantive content that serves to substantiate a given functional category.

2. The mass/count distinction is not universally grammaticized.

The main purpose of this section is to establish that the mass/count distinction comes in two different guises, i.e. there are two distinct sources for this distinction (Bosweld de Smet 1997, Joosten 2003). On the one hand the distinction appears to be based on the ontological property of a nominal root (henceforth (\sqrt{R} -property)). That is, nouns may denote substances or individuals. But this distinction is not categorical: there are things that cannot be uniquely classified as one or the other. On the other hand, however, the mass/count distinction appears to be based on the grammatical properties of a nominal phrase (henceforth f-property). This distinction is categorical in that there are a number of morpho-syntactic diagnostics that clearly divide nominal phrases as belonging to one or the other. I assume that grammatical properties are always tied to functional structure (see Borer 2004, Marantz 1997) and accordingly, we can represent the difference between \sqrt{R} -properties and f-properties as in (1).

- (1) $\begin{array}{c} \text{F} \\ \diagdown \quad \diagup \end{array}$ \rightarrow mass/count distinction as a property of grammatical structure (*f-property*)
- | | | |
|------------|------------------------------|--|
| F | $\sqrt{\text{nominal root}}$ | \rightarrow mass/count as an ontological/conceptual property (\sqrt{R} -properties) |
| [-bounded] | /substance/ | |
| [+bounded] | /individual/ | |

In this paper I am not concerned with the relation between \sqrt{R} -properties and f-properties (see Wierzbicka 1985). Suffice it to say that typically substance nouns are realized as mass nouns and individual denoting nouns are realized as count nouns. But this mapping does not proceed in a 1:1 fashion – a crucial argument for the division of labor between \sqrt{R} -properties and f-properties. What I'm concerned with here is to demonstrate on the basis of language variation the necessity to distinguish between \sqrt{R} -properties and f-properties and to develop an analysis that adequately captures the observed variation. In particular, I will show that in Blackfoot and Halkomelem the mass/count distinction is not associated with any categorical f-properties, but only with \sqrt{R} -properties

2.1 The mass/count distinction in English (a quick and simplified review)

To establish a baseline for the kinds of f-properties we may expect from a grammaticized mass/count distinction I start with a brief overview of the ones identified for English. The first cluster of properties has to do with *selectability*. Some determiners and quantifiers are sensitive to the mass/count distinction as illustrated in (2-3).

- (2) a. *the/a/this/that/one/every/each/no/ tree*
 b. *these/those/two/several/some/many/no/all trees*
 c. **much/*little tree(s)*
- (3) a. *?the/*a/this/that/*one/*every/no wood*
 b. **these/*those/*two/*several/*some/*many woods*
 c. *some/no/all/much/little wood*

Second, mass nouns but not (singular) count nouns can function as bare arguments.

- (4) a. *I saw snow.*
 b. *I saw snowflakes.*
 c. **I saw snowflake.*

Third, only count nouns, but not mass nouns can be pluralized.

- (5) a. *There is a **snowflake** in my garden.*
b. *There are **snowflakes** in my garden.*
- (6) a. *There is **snow** in my garden.*
b. * *There are **snows** in my garden.*

Fourth, only count nouns, but not mass nouns can be counted.

- (7) a. *There is **a snowflake** in my garden.*
b. *There are **five snowflakes** in my garden.*
- (8) a. * *There is **a snow** in my garden.*
b. * *There are **five snows** in my garden.*
c. * *There is **five snow** in my garden.*

Fifth, if a language has a grammaticized mass/count distinction for nouns it has **strategies for reclassification**. For example, English has classifiers naming the unit of natural occurrence of a substance and such classifiers turn mass nouns into count phrases.

- (9) a. *I didn't see many **drops** of water. (I didn't see much water.)*
b. *I didn't see many **grains** of sand. (I didn't see much sand.)*

Crucial evidence for decomposing the mass/count distinction into f- and \sqrt{R} -properties comes from the fact that the value of the grammaticized mass/count distinction is not always predictable from \sqrt{R} properties. If it were, one distinction would suffice. That is, the existence of form-meaning mismatches such as the ones listed in (10) supports the dual source of the mass/count distinction.

- (10) *furniture, silverware, grass, homework, luggage...*

Even though the classification of such nouns as mass or count is arbitrary, once they are classified as mass, grammar blindly treats them as mass nouns, despite the fact that they denote individuals. Consequently, such nouns cannot be counted (11), cannot be pluralized (12), can combine with determiners selecting for mass (13), and can function as bare arguments (14).

- (11) a. **There is **a furniture/silverware/grass/luggage** in my garden.*
b. **There are **five furnitures/silverwares/grasses/luggages** in my garden.*
c. **There is **five furniture/silverware/grass/luggage** in my garden.*
- (12) a. *There is **furniture/silverware/grass/luggage/homework** in my garden.*
b. **There are **furnitures/silverwares/grasses/luggages** in my garden.*
- (13) a. *?the/*a/this/that/*one/*every/no **furniture/silverware/grass/luggage***
b. * *these/*those/*two/*several/*some/*many **furnitures/silverwares/grasses/luggages***
c. *some/no/all/much/little **furniture/silverware/grass/luggage***
- (14) *I saw **furniture/silverware/grass/luggage/homework***

Thus, while ontologically these nouns would be classified as individual denoting (rather than substance denoting) nouns, for the purpose of the grammar they nevertheless behave like count nouns. This supports that decomposition proposed in (1).

Further evidence for the independence of ontological distinctions from grammatically relevant ones comes from the fact that ontological properties can be available even when the grammatical ones are not. For example, in the context of root compounds, which by hypothesis lack any type of functional structure, the difference between substance and individual roots is still available as shown in (15). Since only substances can be poured only substance denoting roots can function as the non-head part of the compound headed by *pourer*. In contrast, since only individuals can be picked, only individual denoting roots can function as the non-head part of the compound headed by *picker*.

- (15) a. *water pourer* #*water picker* b. #*berry pourer* *berry picker*
 wine pourer #*wine picker* #*flower pourer* *flower picker*

Moreover, Harley 2003 shows that in the context of denominal verbs the mass/count distinction plays a role in determining the aspectual properties of the VP. Denominal verbs based on mass nouns yield atelic events (16), while denominal verbs based on count nouns yield telic events (17).

- (16) a. *The mare foaled* #*for 2 hours/ in 2 hours.*
 b. *The dog whelped* #*for 2 hours/ in 2 hours.*
 c. *The cow calved* #*for 2 hours/ in 2 hours.*
- (17) a. *The baby drooled* *for 2 hours/# in 2 hours.*
 b. *The athlete sweat* *for 2 hours/# in 2 hours.*
 c. *The wound bled* *for 2 hours/# in 2 hours.*

Assuming that such word formation is derived via root incorporation, it follows that the functional structure responsible for the grammaticized properties cannot be available. If so, this implies that even at the root level, there is a sense in which the mass/count distinction plays a role. In our terms, it is the \sqrt{R} -properties rather than the f-properties which are available.

Having established that the mass/count distinction familiar from languages like English has two independent sources, one ontological and one grammatical, we can now turn to the two lesser studied languages that form the empirical basis of our investigation.

2.2 The mass/count distinction in Halkomelem and Blackfoot

In this subsection, I demonstrate that the mass/count distinction is not universally grammaticized. In particular, I show that the relevant f-properties that categorize mass/count nouns as such are not available in Halkomelem (Central Coast Salish) or in Blackfoot (Algonquian). First, we observe that unlike in English, the mass/count distinction is not subject to selectability. To the best of my knowledge, there are no determiners or quantifiers that are sensitive to this distinction. This is illustrated in (18)-(19) for Halkomelem and in (20)-(21) for Blackfoot.

- (18) a. *tseł kw'êts-lexw qex (te) syíts'em/siyólh/qó/mélk*
 1sg.s see-trans Q det sand/wood/water/milk
 'I saw lots of sand/wood/water/milk.'
- b. *tseł kw'êts-lexw qex (te) theqát/sth'im/swíweles*
 1sg.s see-trans Q det tree/berry/boy
 'I saw lots of trees/berries/boys.'

- (19) a. *tsel kw'éts-lexw mekw' (te) siyíts'em/ sqélep/ siyólh*
 1sg.s see-trans Q det sand/dirt/wood
 'I seen all the sand/dirt/wood.'
- b. *tsel kw'éts-lexw mekw' (te) theqát/sth'im/swíweles*
 1sg.s see-trans Q det.pl tree/berry/boy
 'I seen all the trees/berries/boys.'
- (20) a. *nitohkanaissimatoop'p annihkayi aohkíi*
 nit-**ohkan**-a-simatoovti-'p anni-hka-yi aohkíi
 1-all-dur-drink.vti-2/1>in det-invis-in.sg water
 'I drank (up) all of that water.'
- b. *nitohkannainowayi anniksisk pookaiks*
 nit-**ohkan**-a-ino-aa-yi ann-iksi pooka-iks
 1-all-dur-see.vta-dir-pl det-pl. child-pl
 'I saw all the children.'
- (21) a. i. *i'náksikoo'nksko* ii. *i'nákaohki* iii. *i'nákónnikis*
 i'nák- kóónssko i'nák-aohki i'nák-ónnikis
 small-snow small-water small-milk/breast
 'a little bit of snow' 'a little bit of water' 'a little bit of milk'
- b. i. *i'náksipokaa* ii. *i'nakánao'kssi* iii. *i'nákónnikis*
 i'nák-pokaa i'nák-ánao'kssi i'nák-ónnikis
 small child small-halfdollar small-milk/breast
 'baby' 'quarter of a dollar' 'small breast'

Secondly, in neither one of the two languages, the mass/count distinction has an effect on the syntax of arguments. That is, all nouns must be preceded by a determiner, independent of whether they denote a substance or an individual. This is shown for Halkomelem in (22) and for Blackfoot in (23).

- (22) a. *tsel kw'éts-lexw *(te) syíts'em/ sqélep/ siyólh*
 1sg.s see-trans det sand/dirt/wood
 'I seen sand/dirt/wood.'
- b. *í:mex *(te) swíyeqe*
 walking det man
 'The man is walking.'
- (23) a. *nitaissimatoop *(omi) aohkíi*
 nit-a-simatoovti-'p omi aohkíi
 1-dur-drink.vti-2/1>in dem water
 'I'm drinking that water.'
- b. *nitsinoaa *(oma) piita*
 nit-ino-aa oma piita
 1-see.vta-dir det eagle
 'I saw the eagle.'

Next, pluralization is not sensitive to a mass/count distinction: all nouns no matter whether they denote substances or individuals can be pluralized in both Halkomelem (24) and Blackfoot (25)

| | | | |
|------|-------------------------|---|-----------------------|
| (24) | Singular | Plural | |
| a. | th'exet gravel | th'exth'éxet gravel.pl | |
| b. | syiq snow | syiqyiq snow.pl | |
| c. | spiw ice | spepíw ice.pl | |
| d. | shwathetel fog | shweláthetel fog.pl | |
| e. | speháls wind | spelháls wind.pl | |
| (25) | Singular | Plural | |
| a. | sopo 'wind' | ikkináisopoistsi 'soft winds' | |
| b. | aaapan 'blood' | aaapaistsi 'bloods' | |
| c. | aiksinoosak 'bacon' | aiksinoosakiksi 'bacon' (slabs or slices of) | |
| d. | isstsskáán 'dust' | isstsskáistsi 'dust' (pl.) | |
| e. | isttsiksípoko 'salt' | isttsiksípokoistsi 'salts' | |
| f. | kaatsi 'driftwood' | káatsiistsi 'pieces of driftwood' | |
| g. | kokóto 'ice' | kokótoistsi 'ice' (plural) | Frantz & Russell 1991 |

Finally, it is a striking fact about both Halkomelem and Blackfoot that there does not seem to be a dedicated strategy for reclassification. In Halkomelem, for example, there are no classifiers that name the unit of natural occurrence of a substance such as *grain* or *drop*. Instead, there are other strategies to express those meanings. For example, there is a specialized form with the meaning 'drop of water' which is not transparently related to the form for 'water'.

- (26) a. th'q'ém/th'eq'ém
'drop of water'
b. qo
'water'

Moreover, regular modifiers can be used in contexts where in English we would use a classifier. Consider the examples in (27). The modifiers *i'axwíl* ('small') and *emémel* ('small') can be used with substance nouns to refer to individual grains. This simply reflects the ontological fact that a grain is a small amount of sand. Consequently, the same form can also be used to refer to any small amount of sand, not necessarily just a grain. We thus observe that there are two possible translations for this sentence.

- (27) tsel kw'éts-l-exw i'axwíl syíts'em
1sg.s see-trans-3o small sand
i) 'I seen a grain of sand.'
ii) 'I seen a little bit of sand.'

Crucially, the same two modifiers can also be combined with /substance/ nouns that do not have a natural form of occurrence. In this case the result can be individuated (the ‘small piece’ reading) but it need not be (the ‘small amount’ reading).

- (28) *tseł kw'éts-l-exw (te) i'axwíl siyólh*
 1sg.s see-trans-3o det small wood
 i) ‘I saw a piece of wood.’
 ii) ‘I saw a little bit of wood.’

And finally, the same modifier can also co-occur with nouns denoting individuals and in this case the smallness refers to the size of the individual.

- (29) *tseł kw'éts-l-exw i'axwíl theqát/theqtheqát*
 1sg.s see-trans-3o small tree/tree.pl
 ‘I saw a small little tree/small little trees.’

This clearly establishes that these modifiers do not serve the function to turn a mass noun into a count phrase.

The same holds true for Blackfoot as well. We have already seen one such example involving the modifier *i'nák* in (21)a/b(iii) above. Here the same noun can be used to refer to a bounded or an unbounded individual (*breast* vs. *milk*, respectively) and in both cases it can be modified by *i'nák*. The same phenomenon can also be observed in the examples in (30).

- (30) a *iikakayi amostsi mistists*
 iik-aka-i amo-istsi mistis-istsi
 int-many-be dem-pl.inanim wood-pl.inanim
 ‘There is a lot of wood.’
 b. *iikakayimi amoksi mistiks*
 iik-aka-imi amo-iksi mistis-iksi
 int-many-be.anim dem-pl.anim wood-pl.anim
 ‘There are a lot of trees.’

On several occasions I have asked my consultant how to say things like ‘several pieces of wood’ or ‘snowflake’ and she would consistently use nouns with a modifier that is also compatible with both substance and individual nouns. In fact she told me that “We don’t get into this kind of stuff.”

This much establishes that Halkomelem and Blackfoot do not formally classify their nouns along a distinction in boundedness. This does however not mean that nouns cannot refer to either substances or individuals, just that this ontological distinction does not map onto a formal classification system. There is however one property of substance nouns in both languages which may suggest that something like the mass/count distinction is nevertheless active. Sometimes, but crucially not always, /substance/ nouns can be counted. As shown in (31), in Halkomelem sand and wood can be counted but snow and wind cannot. And as shown in (32), in Blackfoot wood and blood can be counted, but snow cannot (32).

- (31) a. *tseł kw'éts-l-exw isále siyítsem/siyólh*
 1sg.s see-trans-3o two sand.pl/wood/
 ‘I seen two {pieces of,kinds of} sand/wood.’
 b. **tseł kw'éts-l-exw isále syiqyiq/pehals*
 1sg.s see-trans-3o two snow.pl/wind
 ‘I seen two snow/wind.’

- (32) a. *nitoohkoonimhniisitoyi mistsis*
 nit-ohkooni-m-hp-yi niisitoyi mistsis
 1-find.vti-1>i-indep-sg five wood
 I found five pieces of wood
- b. *natokayi a'apann-ists iihstokina*
 nááto'k-ayi aáápan-ists iihst-sokin-aa
 two blood-pl -treat.vta-dir
 'There were 2 blood (bags) used to treat him.'
 Consultant's comments: you can say this in the hospital
- c. **nitohkoonimh niisitoyi poota*
 nit-ohkooni-m-hp-yi nisitoyi poota
 1-find.vti-1>i-indep-sg five snow
 I found five snow

I conclude that countability is sensitive to ontological \sqrt{R} -properties rather than grammatical f-properties and consequently it does not behave in any systematic way. This is consistent with the fact that my Blackfoot consultant has given different grammaticality judgments for counting water on different occasions as shown in (33).

- (33) a. **nitohkanaisimatoo'p niisitoyi aohkii*
 nit-ohkan-a-simatoo-'p niisitoyi aohkii
 1-all-dur-drink.vti-2/1>i five water
 I drank five water
- b. *nááto'kayi aohkiists*
 nááto'k-ayi aohkii-istsi
 two water-pl
 'two water'
 Consultant's comments: you can use this for two containers of water

2.3 Summary

In this section we have seen that the mass/count distinction manifests itself in different ways across different languages. This is summarized in table 1.

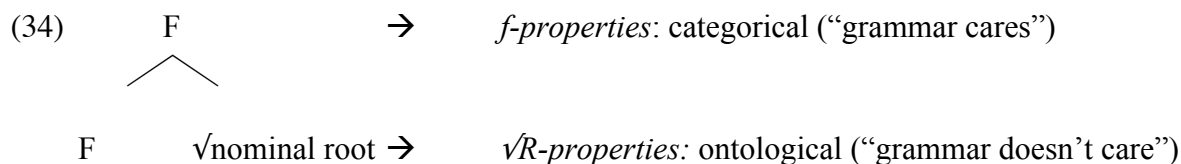
| Properties of the mass/count distinction | English | Halkomelem/Blackfoot | |
|--|---------|----------------------|---------------------------------|
| can be selected by determiners/quantifiers | Yes | no | f-properties |
| can function as bare arguments | yes | no | |
| can be pluralized | no | yes ¹ | |
| can be counted | No | sometimes | $\sqrt{\text{root}}$ properties |

Table 1: Cross-linguistic differences in the manifestation of the mass/count distinction

Assuming two distinct sources for the mass/count distinction, one ontological and one grammatical, we can understand the differences in behavior. Specifically, where English differs from Halkomelem and Blackfoot categorically I assume that the source of variation lies in the f-properties. These are the properties that grammar cares about. In contrast, where judgments are not categorical but unstable, I

¹ The majority of /substance/ nouns are listed with a pluralized forms in the dictionary. There are however some for which no such form is found. The non-existence of plural forms in both Halkomelem and Blackfoot cuts across the mass/count distinction however. In particular, there are /individual/ and /substance/ nouns that don't have plural form.

assume that it is the \sqrt{R} -properties that are responsible. In this case grammar does not seem to care. This is illustrated in (34).



If this approach is on the right track, we have to conclude that countability is not among the set of f -properties. But if this is the case, then there is an important lesson to learn here. Since \sqrt{R} roots in Halkomelem and Blackfoot can be counted without the presence of a grammaticized mass/count distinction we can conclude that \sqrt{R} roots do not require individuation or partitioning in order to interact with the count system (contra Borer 2004, Chierchia 1998). If this is so, we predict that in English as well, roots should be countable even if the functional layer responsible for the mass/count distinction is absent. This prediction is indeed borne out. In the context of compounds, which lack the functional layer responsible for the mass/count distinction, counting is possible independent of whether the nominal root denotes an individual as in (35) or a substance as in (36).

- (35) a. **three** card trick, **three** colour process, **three** piece, **three** point turn
 b. **four** leaf clover, **four** letter word, **four** wheel drive, **four** stroke, **four** star
 c. **five** finger exercise, **five** year plan
 d. **six** day war²

- (36) a. **five** spice, **five** spice powder
 b. **five** grain cereal

Since countability is not dependent on the presence of a grammaticized mass/count distinction, it follows that it is not a reliable diagnostics for a categorical grammaticized mass/count distinction.

3. The categorical identity of F

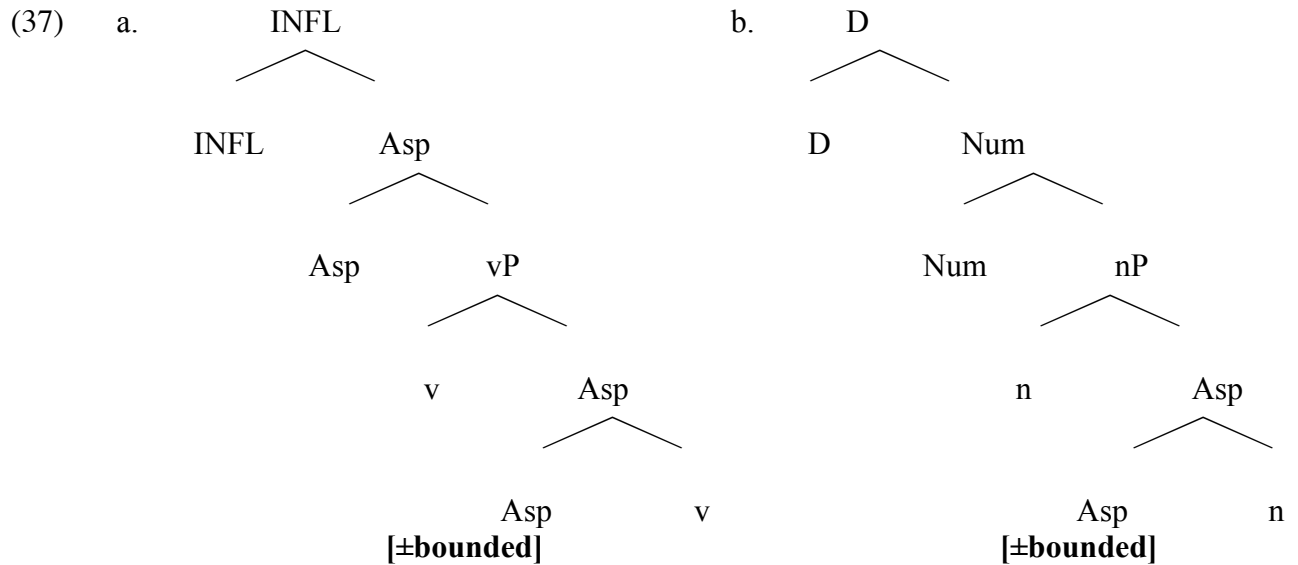
We have now established that not all languages categorically classify their nouns as mass or count. We have further argued that the source of variance is tied to a functional layer above the nominal root and not the root itself. This is consistent with the assumption that parametric variation is tied to functional categories (Borer 1983). The purpose of this section is to argue that the functional category responsible for formally classifying nominals as either mass or count is *nominal inner aspect*.

3.1 What is the categorical identity of F?

Thus far we have remained agnostic about the categorical identity of the functional layer that is responsible for the f -properties associated with the mass/count distinction. We have simply labeled it as F in (34). So the question we are facing now concerns the identity of the functional category that hosts the features responsible for the mass/count distinction. Following Jackendoff 1991, I assume that the relevant feature is [\pm bounded]. In the verbal domain, this feature is associated with a functional category known as *inner Aspect* (Travis 2005) found inside the argument-structure defining verbal

² Sometimes numerals are also found inside a phrasal compound, in which case we find plural marking on the counted noun: i) *seven years war*

categories (v), as shown in (37)a. Given the well-established parallel between verbal and nominal functional structure, I propose that *inner Aspect* is a category also found in the nominal domain as illustrated in (37)b. In English, verbal and nominal inner aspect, both host the same feature, namely [\pm bounded].

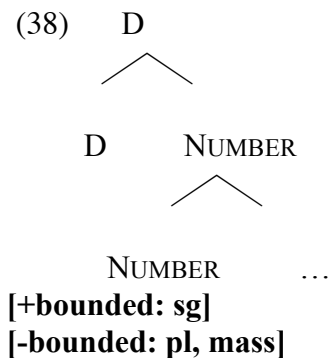


This proposal is a formal implementation of Rijkhoff's 1991 proposal according to which the mass/count distinction reflects the nominal counterpart of verbal Aktionsart, namely *Seinsart* (see also Muramatso 1998).

In what follows I eliminate two alternative analyses. Specifically, I show that neither the functional category NUMBER nor the semi-functional category *n* can be assumed to host the boundedness feature.

3.2 Is it NUMBER?

It has been argued that the functional category responsible for the mass/count distinction is the very same category that hosts number marking in languages like English and classifiers in languages like Chinese (Borer 2005, Chierchia 1998, Ghomeshi 2003, inter alia). According to this view, roots are neither count nor mass. The addition of number marking in English yields a count noun, and according to Borer 2005, the absence of such marking yields a mass noun by default. This view is sketched in (38) below.



The hypothesis that the relevant functional category responsible for number marking is also responsible for the grammaticized mass/count distinction appears to be supported by the Halkomelem facts. The absence of the grammaticized mass/count distinction correlates with the absence of grammaticized number in this language (Wiltschko 2005, 2008). While in Halkomelem reduplication functions as a pluralizer, it is not associated with f-properties. As a consequence it is optional in the context of numerals and quantifiers (39). Moreover, plural marking does not trigger obligatory concord, as shown in (40).

- (39) a. *te lhíxw swíweles/ swóweles*
DET three boy/ boy.PL
 ‘the three boys’
 b. *qex te s-th’ím/ s-th’eth’ím*
many DET NOM-berry/NOM-berry.pl
 ‘many berries’
- (40) a. *t’ílém ye s-í:wí:qe* b. *t’ílém te s-í:wí:qe*
sing DET.PL man.PL *sing DET man.PL*
 ‘The men are singing.’ ‘The men are singing.’
 c. *t’ílém ye swíyeqe* d. *t’ílém te swíyeqe*
sing DET.PL man *sing DET man*
 ‘The men are singing.’ ‘The man is singing.’

On the view that the same functional category is responsible for the f-properties of number marking and for the f-properties of the mass/count distinction the differences between English and Halkomelem can be straightforwardly accounted for in terms of variation in the availability of NUMBER. In a language where NUMBER is available, we expect to find f-properties to be associated with both the mass/count distinction and number marking. This is the case for English. In a language where NUMBER is not available, we do not expect to find f-properties associated with either the mass/count distinction or plural marking. This is the case in Halkomelem.

Unfortunately, however, the correlation between f-properties associated with number marking and the mass/count distinction breaks down in Blackfoot. In this language, the mass/count distinction is not associated with f-properties, but number marking is. This is summarized in table 2.

| | Engl | Halkomelem | Blackfoot |
|---|------|------------|-----------|
| Mass/count distinction has f-properties | ✓ | ✗ | ✗ |
| Number marking has f-properties | ✓ | ✗ | ✓ |

Table 2. Grammaticized mass/count vs. number marking

Evidence that plural marking in Blackfoot displays f-properties comes from the fact that it triggers obligatory concord, and it is obligatory in the context of numerals.

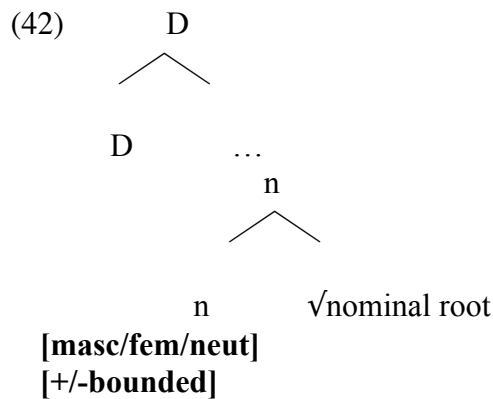
- (41) a. *oma ponoká-wa*
D_{SG} elk-SG
 ‘the elk’
 b. *om-iksi ponoká-íksi*
D-PL elk-PL
 ‘these elks’
 c. **oma ponoká-iksi*
D_{SG} elk-PL
 ‘the elk’
 d. **om-iksi ponoká*
D-PL elk
 ‘these elks’

However, as we have seen in section 1.2, plural marking is not sensitive to the mass/count distinction. All nouns in Blackfoot can be pluralized independent of whether they denote individuals or substances (see (25)).

The existence of the Blackfoot pattern thus establishes that we cannot tie the presence or absence of a grammaticized mass/count distinction to the presence or absence of grammaticized number marking. This undermines the hypothesis that the functional category relevant for the f-properties of the mass/count distinction is NUMBER.

3.3 Is it GENDER?

Another potential hypothesis regarding the locus of the mass/count distinction in the nominal domain would be to associate it with *n*. This would amount to saying that the count/mass distinction essentially functions as a nominal classification device akin to gender in German. This possibility is sketched in (42).



Initial evidence for this possibility comes from the behaviour of diminutive suffixes. They are associated with neuter gender and they appear to turn mass/nouns into count nouns (van Riemsdijk, p.c. reported in Borer 2005: p. 92, Fn.6). This is illustrated in (43). The diminutivized form of the mass nouns *Brot* and *Schnaps* function as count nouns. This can be seen on the basis of the fact that the preceding quantifier shows plural agreement.

- | | | |
|------|--|---|
| (43) | a. <i>viel Brot</i> much bread 'much bread' | a'. <i>viele Bröt-chen</i> many.pl bread-dim 'many little sandwiches' |
| | b. <i>viel Schnaps</i> much Schnaps 'much Schnaps' | b'. <i>viele Schnaps-erl</i> many.pl Schnaps-dim 'many little (good) Schnaps' |

The mass/count distinction however co-exists with the gender distinction and crucially cuts across the values for GENDER. In particular, there are mass nouns of all three genders (44) just like there are count nouns of all three genders (45).

- (44)
- | | |
|----|--|
| a. | <i>Ich habe den Wein getrunken</i> I aux det.masc wine drunk 'I have drunk (the) wine.' |
| b. | <i>Ich habe das Wasser getrunken</i> I aux det.neut water drunk 'I have drunk (the) water.' |

c. *Ich habe die Suppe getrunken*
 I aux **det.fem** soup drunk
 ‘I have drunk (the) water.’

(45) a. *Ich habe den Apfel gegessen*
 I aux **det.masc** apple eaten
 ‘I have eaten the apple.’

b. *Ich habe das Semmerl gegessen*
 I aux **det.neut** water eaten
 ‘I have eaten the roll.’

c. *Ich habe die Karotte gegessen*
 I aux **det.fem** carrot eaten
 ‘I have eaten the carrot.’

In sum, the patterns of variation we observe in the occurrence of nominal classification devices suggests that a grammaticized mass/count distinction does not correlate with the presence of grammaticized NUMBER or GENDER as summarized in table 3.

| | Engl | Halkomelem | Blackfoot | German |
|---|------|------------|-----------|--------|
| Mass count distinction has f-properties | ✓ | ✗ | ✗ | ✓ |
| NUMBER has f-properties | ✓ | ✗ | ✓ | ✓ |
| GENDER has f-properties | ✗ | ✗ | ✗ | ✓ |

Table 3. Typology of nominal classification devices

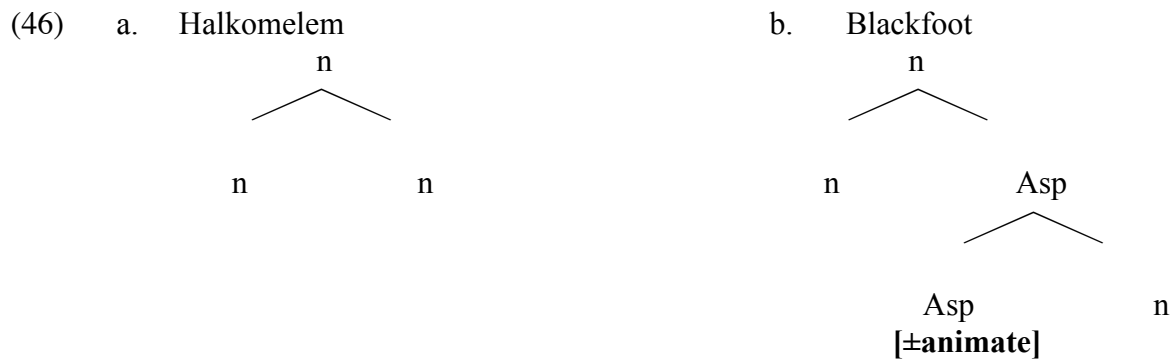
We conclude that the mass/count distinction is neither associated with NUMBER nor with *n*. It follows that it must be associated with another functional category. This indirectly supports Rijkhoff’s proposal according to which the mass/count distinction instantiates nominal inner Aspect.

4. Variation in the content of inner Aspect: [±bounded] versus [±animate]

Thus far, we have established that the mass/count distinction is not universally grammaticized. Neither Halkomelem nor Blackfoot makes use of such a distinction. We take this to mean that in these languages the [±bounded] feature is not associated with inner Aspect. There is however another question that arises in light of this analysis. Is it possible to have inner Aspect in the absence of [±bounded]? Or does the lack of the feature [±bounded] necessarily imply the lack of the functional category that hosts it?

In this section I argue that both these options are attested. Halkomelem lacks the functional category inner aspect, as in (46)a.³ Blackfoot has inner Aspect, but it serves as the host for a different feature, namely [+/-animate], as in (46)b.

³ That this is an option made available by UG is argued for in MacDonald (2008), who analyzes Russian as lacking inner Aspect in the verbal domain..



The assumption that Halkomelem lacks inner Aspect captures the fact that there is no nominal classification device akin to the mass/count distinction. Consequently, no classificatory properties are listed in Galloway’s dictionary of the language. This contrasts with English, where dictionary entries for nouns list their classification as either mass or count. I have nothing else to add to the Halkomelem pattern. Instead I focus on Blackfoot and I argue that instead of the [±bounded] feature, inner Aspect hosts [±animate]. This captures the fact that the dictionary entries of all Blackfoot nouns list the value of this feature (Frantz & Russell 1995). I develop the argument as follows. I first argue that Blackfoot animacy is formally different from gender marking of the German type (4.1). I then show that it behaves formally similar to the mass/count distinction in English (4.2).

4.1 Blackfoot animacy is not a form of gender

According to the traditional Algonquianist view, animacy is a form of gender marking (Dahlstrom 1995, Darnell & Vanek 1976, Goddard 2002, Greenberg 1954, Hockett 1966, Joseph 1979). A contrastive examination of German gender and Blackfoot animacy, however, reveals that the two classification devices differ in formal and functional properties. For example Kilarski 2007: 334 points out that “*the principal differences between Algonquian and Indo-European gender, apart from the different number of genders — usually two or three in Indo-European — involve the type of assignment criteria: in contrast to Algonquian, semantic criteria in Indo-European are usually weaker, being combined with formal ones (morphological or phonological). Furthermore, sex, rather than animacy, is the primary distinction [...].*”

Here I am mainly concerned with the formal differences suggesting that we are dealing with two distinct nominal classification devices. I present two pieces of evidence. First, in German, all nominalizing suffixes are classified for gender; this is not true for Blackfoot animacy (4.1.1) Second, in German all nouns are associated with a unique value for gender; in contrast, there are numerous Blackfoot nouns that are associated with different values for animacy (4.1.2).

4.1.1 Classification of nominalizing suffixes

Nominalizing suffixes in German are all associated with a unique value for gender. The suffix *-ik* attaches to roots, which do not exist as independent words, and derives feminine nouns(47). The suffix *-er* attaches to roots and derives masculine nouns (48).

- (47) *-ik* → [fem]
- | | | |
|---------------------------------|------------------------------|-----------------------------|
| a. <i>die</i> <i>Grammat-ik</i> | b. <i>die</i> <i>Graf-ik</i> | c. <i>die</i> <i>Mus-ik</i> |
| det.f grammar | det.f graphic | det.f music |
| ‘the grammar’ | ‘the graphic’ | ‘the music’ |

- (48) *-er* → [masc]
- | | | |
|-----------------------|-----------------------|-----------------------|
| a. <i>der Lehr-er</i> | b. <i>der Fahr-er</i> | c. <i>der Gärt-er</i> |
| det.m teach-er | det.m driv-er | det.m garden-er |
| ‘the teacher’ | ‘the driver’ | ‘the gardener’ |

There is evidence that the gender of the resulting noun is in fact dependent on the suffix rather than being determined by the root. There are some nominalizing suffixes that attach to existing nouns (as apposed to roots) which are already associated with gender. When suffixed with the nominalizer *-in* the resulting noun is of a different gender as shown in (49). This suggests that it is the suffix itself, which determines the gender of the newly derived noun.

- (49) *-in* [masc] → [fem]
- | | |
|-------------------------|-------------------------|
| a. <i>der Architekt</i> | <i>die Architekt-in</i> |
| det.m architect | det.f architect-f |
| ‘the architect’ | ‘the female architect’ |
| b. <i>der Lehrer</i> | <i>die Lehrer-in</i> |
| det.m teacher | det.f teacher-f |
| ‘the teacher’ | ‘the female teacher’ |
| c. <i>der Student</i> | <i>die Student-in</i> |
| det.m student | det.f student-f |
| ‘the student’ | ‘the female student’ |

The pattern in (47)-(49) suggests that nominal suffixes are associated with gender, and to the best of my knowledge, this is the case for all such suffixes. Note that this pattern also suggests that gender is associated with the lowest layer of nominal classification, as in (50).

- (50) [_{nP} n₂[±bounded]] [_{nP} n₁[gender]] [√root]]

If gender was associated with the higher position, we may expect nouns and nominalizing suffixes that do not uniquely determine the gender of a noun. This is precisely the pattern we observe in Blackfoot, as I will now show.

The Blackfoot nominalizing suffix *a'tsis* can derive [+animate] nouns as in (51) as well as [-animate] nouns as in (52). Since in Blackfoot, plural marking varies with the value for animacy I use it as a diagnostic throughout this paper.

- (51) *a'tsis* → [+animate]
- | | |
|---------------------------------|-------------------------------------|
| a. <i>saa'kssoyaa'tsis</i> | <i>saa'kssóyaa'tsiiksi</i> |
| <i>saa'kssoya-a'tsis</i> | <i>saa'kssóya-a'tsis-iksi</i> |
| ‘poison ivy’ | ‘poison ivy plants’ |
| b. <i>aawápsspiinao'sa'tsis</i> | <i>sikawapsspiina'sa'tsiiksi</i> |
| <i>aawápsspiinao's-a'tsis</i> | <i>sikawapsspiina's-a'tsis-iksi</i> |
| ‘eye-glasses’ | ‘black eye-glasses’ |
| c. <i>ippotsísoohsa'tsis</i> | <i>ippotsísoohsa'tsiiksi</i> |
| <i>ippotsísoohs-a'tsis</i> | <i>ippotsísoohs-a'tsis-iksi</i> |
| ‘pants, overalls’ | ‘pants, overalls’ |

- (52) *a'tsis* → [-animate]
- | | |
|---------------------------|------------------------------------|
| a. <i>isoohkamaa'tsis</i> | <i>poksisoohkamaa'tsiistsi</i> |
| <i>isoohkama-a'tsis</i> | <i>poks-isoohkama-a'tsis-istsi</i> |
| ‘container’ | ‘little storage bags’ |

| | |
|-----------------------------|----------------------------------|
| b. <i>issáana'kima'tsis</i> | <i>issáana'kima'tsiistsi</i> |
| issáana'kim- a'tsis | issáana'kim- a'tsis-istsi |
| candle, lit: fat lamp; | 'candles' |

For completeness note that it is not the underlying form which determines the gender of the derived form. The suffixation of *a'tsis* to a [+animate] nouns results in a [-animate] noun, as shown in (53).

(53) *a'tsis* [+anim] → [-anim]

| | |
|---------------------------|------------------------------------|
| a. <i>issitsimaan</i> | <i>issitsimaaniksi</i> |
| issitsímaan | issitsímaan- iksi |
| baby | babies |
| b. <i>issitsímaa'tsis</i> | <i>nitssitsímaa'tsiistsi</i> |
| issitsíma- a'tsis | nits-issitsíma- a'tsi-istsi |
| 'baby thing' | 'my baby things' |

We can understand the lack of animacy specification of *a'tsis* if we assume that this nominalizer is associated with the lower nominal layer and that animacy is a higher nominal classification device as shown in (54).

(54) [_{NP} n₂[±animate] [_{NP} n₁[-*a'tsis*] [...]]]

4.1.2. Classification of nouns

The second argument that animacy in Blackfoot is formally distinct from German gender stems from the fact that some nouns are associated with two values, with a different albeit related meaning. Consider the example in (55). The same form *miistsis* can be used as a [-animate] noun to mean *stick* or *branch* or as a [+animate] noun to mean *tree*.

(55) a. [-animate] *miistsis* *miistsíistsi*

| | |
|-----------------|------------------------|
| <i>miistsis</i> | <i>miistsíis-istsi</i> |
| branch | branch-pl.inanim |
| 'stick, branch' | 'branches' |

b. [+animate] *miistsis* *miistsíiksi*

| | |
|-----------------|-----------------------|
| <i>miistsis</i> | <i>miistsíis-iksi</i> |
| tree | tree-pl.anim |
| 'tree' | 'trees' |

This particular example is famous for it shows that animacy is not a notion that necessarily depends on the ontological properties of the referent. However, the general pattern appears to be moderately productive. That is, in Frantz & Russell's 1995 dictionary there are several such examples.

What is of interest in the present context is that the Blackfoot animacy specification differs from the German gender specification in precisely this respect. There are no nouns that are associated with two distinct genders and still related in meaning.⁴ If a given form has two possible genders associated with it, is for one of the following two reasons. We are either dealing with accidental homophony or else gender is in free variation and does not correlate with a meaning difference.

⁴ The so called common gender of Russian differs in this respect (see Steriopolo 2008, Steriopolo & Wiltschko, in press for discussion).

I conclude that Blackfoot animacy is not a form of gender. It displays formal properties different from those associated with German gender: not all nominal suffixes are classified for animacy, and some nouns can be associated with two values. This is summarized in table 4 below.

| | German Gender | Blackfoot Animacy |
|-------------------------------------|---------------|-------------------|
| All nominal suffixes are classified | ✓ | ✗ |
| some nouns can have two values | ✗ | ✓ |

Table 4: Differences between German Gender and Blackfoot animacy

4.2 Blackfoot animacy is like the boundedness distinction

In this section I show that Blackfoot animacy formally behaves like the boundedness distinction, which gives rise to a formal mass/count distinction in Indo-European languages.

In contrast to gender, the mass/count distinction is not always uniquely determined for a given noun. Consider the German nouns in (56)-(57). They can all be used as mass nouns, in which case they denote an unbounded substance, as in (56). When pluralized, these nouns must be interpreted as denoting bounded individuals, as in (57). In all these cases the bounded form is the special form in that its meaning is not completely compositional: the bounded form of water for example can be used to denote the little liquids used in a salon or spa (which may not even contain water). The bounded form of bread is used for sandwiches and the bounded form of light can be used for Christmas lights.

(56) [-bounded]

- a. *viel Wasser* ‘much water’
- b. *viel Brot* ‘much bread’
- c. *viel Licht* ‘much light’

(57) [+bounded]

- a. *viele Wässer* ‘many waters’ (i.e., in a hairsalon)
- b. *viele Brote* ‘many breads’ (i.e., sandwiches)
- c. *viele Lichter* ‘many lights’ (i.e., christmas lights)

This pattern is reminiscent of a pattern we find associated with Blackfoot animacy marking on nouns. There are many cases where the [-animate] form denotes the general referent, while the [+animate] is the special form. In this case it is often a culturally newer item.

- (58) a. [-animate] *iihtáísínaakio'p* *iihtáísínaakio'pistsi*
pencil, pen pencils/pens
- b. [+animate] *iihtáísínaakio'p* *iihtáísínaakio'piksi*
camera cameras
- (59) a. [-animate] *ko's* *kó'sistsi*
dish (earthenware) dishes
- b. [+animate] *ko's* *kó'siksi*
dish (tin/ metal) dishes
- (60) a. [-animate] *ksisáiki'taan* *ómahksiksisáiki'taanistsi*
arrowhead arrowheads
- b. [+animate] *ksisaiki'taan* *ksisaiki'taaniksi*
cartridge cartridges

While I have nothing to say about the mechanism that underlies this pattern, it is of interest in the present context that animacy marking behaves like the boundedness distinction in German and not like its gender distinction. In this context, an example from Fox cited in Goddard 2002 is of interest.

- (61) a. [-animate] owi·ya·si “meat, flesh”
 b. [+animate] owi·ya·sa “a piece or cut of meat”
 (Goddard 2002: 213)

In (61), the [-animate] form refers to a substance, while the [+animate] form refers to the bounded version of the substance. As such animacy marking seems to play the role of individuation. This is consistent with the claim that it occupies the same position as the boundedness distinction in Indo-European languages.

A second piece of evidence for animacy patterning with the boundedness distinction stems from the fact that animacy marking is subject to selectability. As mentioned above, Blackfoot singular and plural marking is sensitive to animacy marking. As illustrated in Table 5, *-wa* and *-iksi* are singular and plural markings associated with [+animate] nouns while *-yi* and *-istsi* are associated with [-animate] nouns.

| | Singular | plural |
|------------|------------------------|---------------------------|
| [+animate] | ponoká-wa ‘elk-sg’ | ponoká-iksi ‘elk-pl’ |
| [-animate] | í’ksisako-yi ‘meat-sg’ | í’ksisako-istsi ‘meat-pl’ |

Table 5: number marking is sensitive to animacy

I interpret the sensitivity of number marking to animacy as an indication of selectability, one of the formal diagnostics for the boundedness distinction.

Another diagnostic we have identified in section 2, concerned mismatches between the meaning of the root and the nominal classification associated with it. That is, we have seen that the value of the boundedness distinction is not always predictable from ontological properties. The same holds for the animacy distinction in Blackfoot. It cannot always be predicted on the basis of the ontological properties of the root.⁵ We have already seen instances of this in (55) and (58)-(60). But such mismatches between ontological and grammatical properties are not restricted to nouns associated with both values. There are also ontologically inanimate nouns that are grammatically classified as [+animate] as in (62). These nouns do not have a corresponding [-animate] noun.

- (62) a. pokón ‘ball’ d. moápssp ‘eye’
 b. issk ‘pail’ e. naató’si ‘sun’
 c. istoán ‘knife’ f. ksisíís ‘thorn’

A final way in which animacy behaves formally like the boundedness distinction in Indo-European concerns its interaction with verbal aspect. It is well known that in English the boundedness distinction interacts with the verb to determine the telicity of the resulting VP. While an unbounded object (either mass or bare plural) derives an atelic VP, a bounded one derives a telic VP.

- (63) a. Yesterday’s sun melted **a snowflake** (#but there is still some left)
 b. Yesterday’s sun melted **snow** (but there is still some left).

⁵ This is a pervasive property of animacy marking across the Algonquian language family and has attracted much attention in the literature. In particular, it has served as a major argument in the claim that animacy is a formal property (Bloomfield 1933, Black 1969, Dahlstrom 1995, Darnell & Vanek 1976, Goddard 2002, Greenberg 1954, Lehmann 1958) though attempts have been made to at least account for (if not predict) these apparent mismatches in semantic terms (Hallowell 1960, Black-Rogers 1982).

c. Yesterday's sun melted **snowflakes** (but there are still some left).

On the present view, the interaction between the mass/count distinction and verbal telicity reflects the fact that the same feature ([±bounded]) is associated with inner aspect in the verbal and in the nominal domain. The correlate of the former is telicity, the correlate of the latter is the mass/count distinction.

In contrast, in Blackfoot, it is the animacy distinction that interacts with the classification of verbal phrases. Like other Algonquian languages, Blackfoot verb stems are sensitive to the animacy of the object (in case of transitive verbs) or to the animacy of the subject (in case of intransitive verbs). This is summarized in table 6.

| | | |
|----------------------------|-----------------------|---------------------|
| Participants | participant inanimate | participant animate |
| final participant unmarked | II | AI |
| final participant marked | TI | TA |

Table 6. Interaction of animacy with verbal classification

This suggests that in Blackfoot [±animate] substantiates not only nominal inner aspect but also verbal inner aspect. On independent grounds, Ritter & Rosen (in press) have argued that this is in fact the case.

I am not aware of any such interaction between gender and verbal classification. Again, this makes Blackfoot animacy formally more similar to the boundedness distinction than to a gender distinction. I thus conclude that Blackfoot animacy marking is the formal equivalent of the mass/count distinction and as such is associated with inner Aspect. This concludes our investigation of the range of variation associated with nominal inner aspect. Our findings are summarized in table 7.

| | English | Blackfoot | Halkomelem |
|------------------------------------|--------------|--------------|------------|
| UG category | inner Aspect | | |
| lg. specific morphological feature | [+/-bounded] | [+/-animate] | -- |
| lg. specific syntactic category | MASS/COUNT | ANIMACY | -- |

Table 7. Range of variation associated with nominal inner aspect

5 Conclusion

In this paper, I have argued that languages display differences in the manifestation of the mass/count distinction. In particular, I have shown that neither in Halkomelem, nor in Blackfoot the mass/count distinction is associated with grammatical f-properties. This contrasts with English where this distinction is in fact categorical. Speakers of Halkomelem and Blackfoot can nevertheless distinguish between substance and individual denoting nouns. I have argued that this reflects the ontological properties of the nominal roots, and that this is also available in English. But in order to detect it in English one has to investigate structures that lack the functional layer responsible for the mass/count distinction. Such structures are available in root compounds as well as in denominal verbs. In all other environments the grammatical classification of nominals as mass or count is obligatory. The diagnostics we have used to establish whether or not there is such a grammaticized mass/count distinction are summarized in table 8.

| | English | Halkomelem | Blackfoot | |
|--|---------|------------|-----------|------------------|
| can be selected by determiners/quantifiers | yes | no | no | f-properties |
| can function as bare arguments | yes | no | no | |
| can be pluralized | no | yes | yes | |
| can be counted | no | sometimes | sometimes | √root properties |

Table 8: Diagnosing the grammaticized mass/count distinction.

Importantly, our study suggests that countability does not serve to diagnose the mass/count distinction. Instead it is only sensitive to the ontological properties of the nominal root. An important implication of this finding is that nominal roots do not require functional structure to be individuated in order to interact with the count system.

The empirical observation that the mass/count distinction is not a universal nominal classification device has led us to investigate its source as well as the range of variation associated with it. In particular, I have argued that the mass/count distinction is best analyzed as resulting from the feature [\pm bounded] associated with nominal inner aspect. Neither Halkomelem nor Blackfoot make use of this feature to classify their nouns. However, there is more to language variation than simply the absence or presence of a specific feature, such as [\pm bounded]. In particular, I have argued that in Halkomelem the absence of this feature reflects the absence of the functional category it associates with in English. In contrast, in Blackfoot, inner aspect is available, but it is associated with a different feature, namely [\pm animate]. Consequently, in Blackfoot all nominals are classified as either animate or inanimate, and this classification is not fully determined by the ontological properties of the nominal root. In this respect animacy in Blackfoot is the formal and functional equivalent of the mass/count distinction in English. This supports the view advocated in Ritter & Wiltschko (2009) according to which language variation may result from different features substantiating the same functional category (i.e, the parametric substantiation hypothesis). It also suggests that functional categories are not merely defined by the features that comprise them, but instead that there is a universal functional hierarchy of functional categories available, independent of the features that associate with them.

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