

# Count-mass nouns, inherent number and the unmasking of an imposter\*

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To appear in *The Proceedings of CLS 50*

## 1 Introduction

The mass/count distinction is often characterized by oppositions of certain properties. Count nouns are thought to show one set of properties, that are different, or lacking, from the set of properties that mass nouns have. Mass nouns are most commonly seen to contrast with count nouns in that they are not countable; that is, they do not combine directly with numerals, as in (1). Count nouns differ from mass nouns in that they combine with plural morphology, but mass nouns do not, (2). And finally, there are some quantifiers like *many* which go with count nouns, and some quantifiers like *much* that only go with mass nouns (3):

- (1) a. There are three ducks in the pond.  
b. \* There are three muds on the ground.
- (2) a. There are ducks in the pond.  
b. \* There are muds in the river.
- (3) a. There are many/\*much ducks in the pond.  
b. There is \*many/much sand left to be moved.

These three properties are classic markers of the mass/count distinction,<sup>1</sup> and they are all obvious from the surface properties of each class of noun. There are

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\*Thanks to Jonathan Bobaljik, Andrea Calabrese, Jon Gajewski, Magdalena Kaufmann, Beata Moskal and Susi Wurmbrand for help and input. All mistakes are mine alone.

<sup>1</sup>Though not all languages show all of these oppositions. Dutch, for instance, has no difference between count quantifiers and mass quantifiers.

also differences between the two classes which seem to relate to the way that the two classes of nouns are interpreted. Count nouns have been argued to be interpreted as if they are individuated, in the sense that we have a clear intuition as to what counts as a minimal unit of a count noun. Mass nouns on the other hand have been claimed to lack this interpretation, and be interpreted as unindividuated ‘stuff’ (Bale & Barner 2009). One test is with *stubbornly distributive predicates* which have been shown to combine with count nouns, but not mass nouns (Schwarzschild 2011). These are predicates like *large*, *small* and *round*, which must be true of each individual unit in a group. For instance, in the sentence *the boxes are large*, this sentence is only judged as felicitous if each individual box is large, and not if there are many small boxes that make up one large pile. In (4), we see that there is a difference between mass nouns and count nouns in how they combine with stubbornly distributive predicates.

- (4) a. The boxes are large/round/square.
- b. # The water is large/round/square.

Another test which shows this interpretation difference is to do with comparison sentences. Bale & Barner (2009) show that when count nouns are compared, comparison is done by the number of individual entities under discussion. Thus, (5a) is true if the number of individual owls that Chris saw is larger than the number of individual owls that Mark saw, irrespective of how big each owl was. For mass nouns on the other hand, comparison is done by overall volume of the noun, and not by number. Therefore in (5b), this sentence is only true if the overall volume of milk that Chris drank is larger than the volume that Mark drank. Here, individual entities do not play a role, so the sentence is false even if Mark drank three single liter bottles of milk, but Chris drank one 5 liter bottle of milk, since the overall volume of milk stands at five liters for Chris, but only three for Mark; the number of individual portions of milk plays no role in the interpretation.

- (5) a. Chris saw more owls than Mark.
- b. Chris drank more milk than Mark.

The above properties are a brief overview of the mass/count distinction, and is not intended to be exhaustive. For more in depth discussion, I refer the reader to Chierchia (1998) and references therein.

The topic of this paper is a class of nouns called count-mass nouns that are present in English. As will be shown, these nouns are some way between count nouns and mass nouns, showing properties of each. I will argue that they are

not, contrary to regular assumption, mass nouns, but in fact they are only made to appear to be mass nouns due to idiosyncratic factors of English.

## 2 Count-mass nouns are atypical mass nouns

In this section I show that count-mass nouns, whilst they seem to be mass nouns since they have the classic surface characteristics of mass nouns, in fact have a semantic interpretation more in line with count nouns as they seem to show a divided individuated interpretation.

### 2.1 The properties of count-mass nouns

Count-mass nouns seem at first glance to be uncontroversially mass nouns. They do not combine with numerals (6), do not take plural morphology (7), and they combine with the mass, but not the count quantifiers (8).

- (6) \* I bought three furniture(s)/mail(s)/luggage(s).
- (7) \* There are furnitures/mails/luggages left to be delivered.
- (8) a. There isn't \*many/much furniture/mail/luggage left to be delivered.  
b. There is \*few/little furniture/mail/luggage left.

However, despite the fact that these nouns seem to have all the surface properties of being mass, when looking at the interpretation of these nouns, they seem to be interpreted as if they are individuated. Doetjes (1997) notes that we seem to have an idea of what a minimal part of a noun like *furniture*, *mail* and *luggage* is. She gives the following pair of sentences, which show that a true mass noun like *cheese* can be continuously divided, and still be considered *cheese*, yet the same is not true of a count-mass noun like *furniture*:

- (9) a. A piece of a piece of cheese is a piece of cheese.  
b. A piece of a piece of furniture is NOT a piece of furniture.

Schwarzschild (2011) shows that count-mass nouns do not pattern with true mass nouns in terms of their ability to combine with stubbornly distributive predicates. Recall from the discussion of (4) above that these predicates are such that they must obligatorily distribute to individual entities, and not be true of an overall collection. Mass nouns do not felicitously combine with these nouns, ostensibly because they are interpreted without the minimal parts necessary for these

predicates to distribute. However, as can be seen below, count-mass nouns quite happily combine with stubbornly distributive predicates, patterning in this respect with count nouns, but crucially not with true mass nouns:

- (10) a. The furniture is large.
- b. The mail is round.
- c. The luggage is small.

Finally, with respect to the semantics, Bale & Barner (2009) show that these nouns are interpreted in comparison contexts in the same way as count nouns, but not in the way that mass nouns are; they are compared by number of entities and not size or volume etc. Therefore, in (11), the sentence is felicitous if it is the case that Chris bought three small barstools and Mark one grand piano, but not vice versa. Therefore, it is the number of individual pieces of furniture that are relevant for comparison, not the overall volume of furniture that was bought, since grand pianos are far larger than barstools.

- (11) Chris bought more furniture than Mark.

## **2.2 How count-mass nouns have been incorporated into the theory of mass versus count**

As shown in the subsection above, count-mass nouns are problematic for giving a uniform theory of what it means to be mass since the fact that these nouns show variable properties between being count (individuated) and mass (surface properties) naturally causes problems for any theory which bases the distinction between count nouns and mass nouns on (lack of) individuation, e.g. Link (1983). Borer (2005) recently proposes that the mass/count distinction is syntactically created; all roots are underspecified for mass or count and that count nouns are created through merger with the root of functional structure that creates individuation. Mass nouns are in essence, the default interpretation of a nominal root, since mass nouns differ from count nouns structurally only in that they miss the dividing head. However, count-mass nouns clearly cause a problem for this, because if there is a strict correlation between surface properties and lack of individuation, count-mass nouns are unexplained.

In response to this problem, Bale & Barner (2009) propose that the mass/count distinction is not characterized by the presence or absence of structure, but simply the presence of absence of division. Roots are still taken to be underspecified

for being mass or count, but when merged into the structure, they combine with a MASS functional head or a COUNT functional head. COUNT creates division, since the interpretation of the head is that it takes something that is unindividuated (like a root for instance) and its output is individuated. MASS on the other hand is an identity function, and it simply maps the input to the output. Thus, since roots are unindividuated when they combine with MASS, they are unindividuated in the output. Count-mass nouns, claim Bale & Barner can only combine with MASS, but crucially not COUNT, since they are inherently individuated, thus they are not able to be the input to COUNT, which can only take unindividuated structures as its input. Since count-mass nouns are individuated as a lexical property, they show the same interpretation as a count noun, even though they have mass structure.

### 3 The effect of inherent number

If, as claimed by the approaches of Bale & Barner (see also de Belder to appear), that count-mass nouns are really underlyingly the same as true mass nouns, differing only in that they have divisibility as an inherent property, then we would expect them to have the same properties as mass nouns with respect to their surface behavior. This, however, is not the case. Bale & Barner note that count-mass nouns are far more resistant with respect to mass to count shifts than mass nouns. In English, it is fairly easy to make a true mass noun like *water* and *beer* into a count noun, such as in (12a) and (12b) below. However, count-mass nouns rigidly refuse to undergo such shifts, (12c):

- (12) a. Mike was so thirsty he drank three waters one after another.  
b. Mike drank so many beers at the party, I didn't think he'd see the end.  
c. \* Mike didn't know what to do with so many furnitures.

Bale & Barner say that the reason that mass to count shifts are not possible with count-mass nouns, is simply because they lie outside the domain of the function. Their interpretation is already one of being individuated, and since COUNT is a function from unindividuated structures to individuated ones, then count-mass nouns are unable to combine with it, and hence are restricted to only appearing with MASS.

The differences however seem to lie deeper than which syntactic head certain roots can combine with. The observation which I wish to note here is that count-mass nouns appear to share a more local relation with their measure phrases than

true mass nouns do. Bhatt (2012) shows that in English, when making comparisons, there are three positions in the sentence that *more* can occupy. *More* can appear between the numeral and the measure phrase (13a), between the measure phrase and the noun (13b) and between the noun and the standard of comparison (13c). These positions are represented schematically in (14):

- (13) a. Mike bought three *more* gallons of oil than Sam.  
b. Mike bought three gallons *more* oil than Sam.  
c. Mike bought three gallons of oil *more* than Sam.
- (14) Mike bought three (❶ *more*) gallons (❷ *more*) (of) oil (❸ *more*) than Sam.

However, when we look at count-mass nouns, we see that position ❷ is unavailable, and *more* is unable to interrupt between the measure phrase and the noun. The other positions for *more* are fine, as shown:

- (15) a. Mike bought three *more* pieces of furniture than Sam.  
b. \* Mike bought three pieces *more* furniture than Sam.  
c. Mike bought three pieces of furniture *more* than Sam.

The fact that position ❷ is unavailable with count-mass nouns hints that they may have a different syntax than true mass nouns, since they clearly seem to hold a more local relationship with the measure phrase than true mass nouns do. Interestingly, in this respect, count-mass nouns behave in much the same way as pluralia tantum nouns, which in many dialects of English require the use of a measure phrase in order for them to combine with numerals (16). In comparison contexts, we find again that position ❷ is unavailable (17):

- (16) Mike packed three \*(pairs of) trousers to take on holiday.
- (17) a. Mike bought three *more* pairs of trousers than Sam.  
b. \* Mike bought three pairs *more* trousers than Sam.  
c. Mike bought three pairs of trousers *more* than Sam.

As it happens, the similarities between count-mass nouns and pluralia tantum nouns do not stop there. As mentioned above, both count-mass nouns and pluralia tantum nouns require some form of measure phrase in order for them to properly combine with numerals. This is also of course true of true mass nouns; however, an important difference that sets apart true mass nouns from the other two classes

is that the measure phrases used for true mass nouns are semantically meaningful, whereas with count-mass nouns and pluralia tantum nouns the measure phrases seem to be semantically vacuous. Count-mass measure phrases are general terms like *bit*, *piece* and *item*, and, as pointed out in Doetjes (1997), these measure phrases “[...] such as *piece* are so general that we can assume that they give us no clue as to how to make a partitioning.” Pluralia tantum measure phrases are items like *pair*, as in *a pair of trousers*, *a pair of scissors*, and *set - a set of wheels*. One could of course claim that these are semantically meaningful in that pluralia tantum can be argued to be things that are pairs. For instance, *trousers* have two legs, *glasses* have two lenses, *scissors* have two blades. Yet it is notable that we are not talking about literal pairs here, *scissors* are not made up of two separate scissor components, nor does one trouser plus one trouser make trousers. Therefore, the semantics of *pair* seems to play little to no role.

Measure phrases for true mass nouns however do have a genuine semantic import. Measure phrases of true mass nouns contribute information about the size and the shape of the quantity of the mass noun that is being described. To see that they have a genuine semantic import, there are notable differences between *a splash of milk* and *a drop of milk*. Similarly, there is a true difference between *a mound of sand* and *a grain of sand*. These differences of shape and size are not present with the measure phrases of count-mass nouns - *a piece of furniture* is the same as *an item of furniture*.

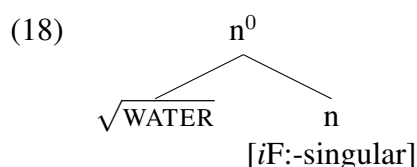
## **4 Count-mass nouns are imposters, masquerading as mass nouns**

The similarities between count-mass nouns and pluralia tantum seem worthy of being taken seriously, and here I propose that the reason that they act the same way is that these properties are the result of each noun having an inherent number specification. I will show how having an inherent number specification in English prevents a noun from combining with non-inherent number. The result of this is that certain nouns can be made to look like mass nouns, even though they are not really. Throughout this section, I will show that all the properties that make count-mass nouns look as though they are mass on the surface are misleading. The fact that they cannot combine with numerals without measure phrases, do not take plural morphology and go with apparently mass quantifiers, all arise independently, from the effect of inherent number.

## 4.1 Background assumptions

I make two key assumptions. Firstly, I assume that count-mass nouns in English are not mass nouns, but rather that they are roots that are inherently specified to be semantically plural. That is, they have an individuated interpretation consisting of individuals and groups of individuals.<sup>2</sup> This is in line with Chierchia (1998), who notes the clear similarities between count-mass nouns and plural count nouns.<sup>3</sup> It is important that they are individuated, since it is with this that they are able to combine with stubbornly distributive predicates and have comparison done by number. The inherent specification is crucially only semantic in nature, and in encoding this I adopt the feature approach that I proposed in Smith (2013), where a single phi-feature has both a semantic value (referred to here as  $[iF]$ ) and a morphological value ( $[uF]$ ). I showed that although in the majority of cases the morphological and semantic value of a feature match, they can diverge, and it is this that I make use of here, assuming that the number feature that is inherent to count-mass nouns is *only* semantic, and has no morphological value.

The second assumption that I make is that the inherent plurality of count-mass nouns is encoded on  $n^0$ , following Kramer (2014), who proposes that inherent features are stored on category defining nodes. Count-mass nouns thus have the following structure when they combine with  $n$ :



This structure I propose inhibits a noun from combining with a non-inherent number specification. I assume that all number features that are not inherent are introduced in NumP (see for instance Ritter 1991, Harbour 2007), and that for them to be realized on roots post-syntactically, they must combine with the root either by head-movement upwards of the root, or post-syntactic lowering. However, in English having an inherent number specification interferes with the root combining with NumP.<sup>4</sup> For now I leave open exactly why this should be the case

<sup>2</sup>I leave open the question of what creates the individuation.

<sup>3</sup>Though Chierchia claims that this is the case for all mass nouns. In short, the proposal is that mass and count nouns have the same interpretation in that they are both interpreted with respect to groups and individuals, but with mass nouns (and count-mass nouns, with Chierchia not claiming that they are a different class) the identification of individuals is semantically vague.

<sup>4</sup>Currently this only applies to English, but perhaps it is also the case in other languages, a question which deserves a fuller investigation that I leave for future work.



in English, and give the following generalization:<sup>5</sup>

- (19) Num<sup>0</sup> cannot be realized on a lexical item that has an inherent number specification.

With it being the case in English that NumP cannot combine with a root that has inherent number, this leaves count-mass roots and pluralia tantum roots unable to combine with NumP. With non-inherent number being introduced in NumP, this means that the only number specification that count-mass nouns and pluralia tantum nouns can receive is that which is inherent. With respect to count-mass nouns, this means that they will always be semantically plural but morphological number will not be able to be realized on the root. In this case, I assume that they are spelled out as singular, with this being the default for a noun without a number specification (Preminger 2011). Putting all of this together, this means that nouns with inherent number in general do not co-occur with NumP. This provides an account of why count-mass nouns rigidly refuse to take plural morphology.

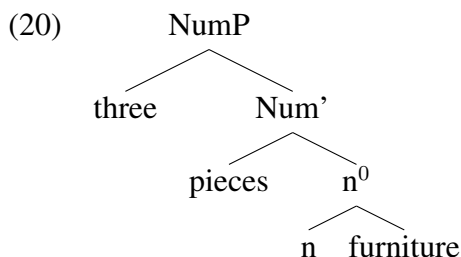
## 4.2 When NumP is present

Though count-mass nouns do not combine with NumP on the same lexical item, there are configurations when they do combine with NumP. One of those instances is when they combine with a numeral, following Watanabe (2010) who proposes that numerals are introduced in the specifier of NumP. Count nouns, when they combine with a numeral, provide a host for the number features that are located on Num<sup>0</sup>. Count-mass nouns however, are not able to do so due to their inherent number, and in order to provide the number features of Num<sup>0</sup> with a host, I propose that a dummy lexical element is inserted. This is akin to dummy-do insertion in English, where *do* is inserted to host the tense features of the auxiliary when it is unable to combine with the verb.

Therefore, in the count-mass structure that undergoes vocabulary insertion below, *piece* is inserted to provide a placeholder for the features on Num<sup>0</sup>, that otherwise could not be hosted:

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<sup>5</sup>A potential explanation is that head movement of the root upwards in the structure is driven by the need to combine with certain features, with roots being deficient in some manner (see Moskal to appear). Having a semantic number feature already there removes the necessity of the root to move, and hence Num<sup>0</sup> is left stranded.



The dummy lexical element I assume to be the measure phrases of count-mass nouns like *bit*, *piece* etc. Since they are dummy elements, this explains why they do not contribute much in the way of semantics, being only placeholders to support features, not inserted to give extra information. Therefore, they are made to look like true mass nouns since they must combine with an apparent measure phrase in order to be counted, however unlike true measure phrases the ones that go with count-mass nouns are not there to provide division, but are only there to host number features. Finally, we can explain why position ② is unavailable with count-mass nouns. If we assume that in the configurations in (13), *more* can either right attach to the numeral, the measure phrase or the noun, then we get three positions. However, since there is no measure phrase in (15), then position ② is never a possibility to begin with. Note that this also explains why position ② is unavailable with pluralia tantum; there is no measure phrase for *more* to attach to in the first place rather *pair* and *set* etc are dummy elements there to host Num<sup>0</sup>.

### 4.3 What about quantifiers?

The final thing which makes count-mass nouns look like mass nouns is the quantifiers which they combine with. It is undeniable that they combine with apparent mass quantifiers like *much* and *little* and not with count quantifiers like *many* and *few*. If count-mass nouns are to be analyzed as only looking like mass nouns, and not really mass nouns at all, as is the claim here, then the fact that these nouns go with mass quantifiers remains to be explained.

Here I propose that apparent mass versus count quantifier selection is in fact allomorphy that is sensitive to the morphological number status of a noun. What we are dealing with is allomorphy: both mass and count quantifiers are allomorphs of the same underlying quantifiers, with the count variant conditioned by morphological plurality and the mass variant being the elsewhere case. Specifically, I propose the following. In English, there are two (relevant) underlying quantifiers MUCH and LITTLE which merge with the noun. In the syntax they undergo agreement with the noun that they quantify over and agree with the noun's number

feature.<sup>6</sup> If this agreement ends up with the quantifier having a plural number feature, MUCH is spelt out as *many* and LITTLE is spelt out as *few*. However, if the noun that is agreed with is not morphologically plural, then the elsewhere rules contained within (21) below are used, and MUCH is spelt out as *much*, and LITTLE as *little*.

- (21)  $\sqrt{\text{MUCH}}, [\text{uF}:\text{-singular}] \Leftrightarrow \text{many}$   
 $\sqrt{\text{LITTLE}}, [\text{uF}:\text{-singular}] \Leftrightarrow \text{few}$   
 $\sqrt{\text{MUCH}} \Leftrightarrow \text{much}$   
 $\sqrt{\text{LITTLE}} \Leftrightarrow \text{little}$

This approach has been followed before in unpublished work by Chierchia, cited (and criticized) by Solt (2009). That this approach is correct is suggested by the fact that quantifiers do undergo agreement in various languages (e.g. Romance languages), and also by data from Telugu (Dravidian), where the behavior of a class of nouns that display all the semantic properties of being mass nouns (not being countable, not combining with stubbornly distributive predicates and doing comparison by volume but not number), behave like count nouns in that they are morphologically plural, and go with the count variant of a quantifier *konni* ‘few’ but crucially not with the mass variant *končam* ‘little’.

- (22) aa abbaaji konni nii-LLu taag-ees-tun-aa-Du  
the boy few water-PL drink-EMPH-PROG-PRES-3.MASC.PL  
‘The boy is drinking some water.’

For a full discussion of these facts, I refer the reader to Smith (2014), but the rules that are given there are as follows. The important point is that the choice between quantifiers is determined by the morphological number, as opposed to the (semantic) mass or count status of the noun:

- (23)  $\sqrt{\text{KONČAM}}, [\text{uF}:\text{-singular}] \Leftrightarrow \text{konni}$   
 $\sqrt{\text{KONČAM}} \Leftrightarrow \text{končam}$

## 5 Conclusions

In this paper I have presented evidence to show that the masshood status of count-mass nouns, at least in English, results from idiosyncratic properties of a lan-

<sup>6</sup>Or agreement is post-syntactic, see Bobaljik (2008). The choice is irrelevant here.

guage and does not reflect an underlying status of the noun being mass. Rather, the thing that makes these nouns look as though they are mass is the fact that they have an inherent number specification: they are semantically plural but without morphological number. In English, this has been shown to prevent the noun from combining with NumP, and, as such, these nouns are not able to receive any plural morphology, nor combine with numerals. Finally, the rules of vocabulary insertion that govern mass/count quantifier allomorphy are sensitive not to the mass/count status of the noun, as has been assumed in most previous work, but rather morphological plurality of the noun. Since count-mass nouns happen to lack morphological plurality, they pattern with mass nouns instead of count nouns.

The findings here show that contrary to a spate of recent papers that specifically focus on what count-mass nouns reveal about the nature of masshood (see Bale & Barner 2009, de Belder to appear), count-mass nouns are not altogether relevant to the theory of what it means to be a true mass noun, since they are mass only by association, and not in any deep manner. There remains a question of whether the surface properties of true mass nouns also all come from an inability to combine with NumP and the vocabulary insertion rules of quantifier allomorphy given above. In sum, with respect to the question of the semantics of masshood, i.e. where (non-)individuation comes from, then count-mass nouns seem not to bear on the issue after all, contrary to these recent claims.

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