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Mass/count workshop
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Count-mass Nouns May Not Be Mass Nouns After All*

1. Introduction

In English and other languages (Dutch, Doetjes 1997, Purépecha, Vázquez-Rojas 2012), the count/mass distinction is not really a bipartite distinction, but rather tripartite. There are count nouns (1), mass nouns (2) and nouns that seem to fall in between (3). Following Doetjes (1997) I will call these count-mass nouns.

(1) a. There is **a duck** in the water. (count)
b. **The boxes** cluttered up the attic.

(2) a. There is **water** flooding through the ceiling. (mass)
b. **The mud** shifted, and we got bogged down.

(3) a. **The furniture** was delivered promptly to my home. (count-mass)
b. The handlers unloaded **the luggage** from the aircraft.

Mass nouns differ from count nouns in the familiar ways, lacking the ability to be counted (4), combine with plural morphology (5) and combine with mass quantifiers (6):

(4) a. There are three ducks in the pond.
b. *There are three muds on the ground.

(5) a. I saw tiles falling from the ceiling.
b. *I saw waters flooding through the ceiling.

(6) a. There are many/*much dogs in the park.
b. There is *many/much sand left to be moved.

Count-mass nouns in English uncontroversially pattern with mass nouns in this respect:

(7) a. *There are three furniture(s) left in the store.
b. *There are three luggage(s) left on the carousel.

(8) a. *I donated furnitures to the store.
b. *I got my mails from the post office.

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(9) a. There isn't much/*many furniture left at home.
b. There isn't much/*many luggage left to be accounted for.

2. Count-mass nouns form a separate class from mass nouns

On the basis of sentences (7-9), there doesn't seem to be much suggestion that we need to treat nouns like *furniture* any differently from mass nouns. But, under various tests, we find that they don't always pattern with mass nouns.

They differ from mass nouns on intuitions of divisiveness. Compare the intuitions about the mass noun in (10a) versus the count-mass noun in (10b) below (from Doetjes 1997):

(10) 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.

Also, they differ from mass nouns in that they do not undergo mass → count shifts (Bale & Barner 2009):

(11) John went to the bar and bought three beers. (mass)

(12) *John went to the store and bought three furnitures. (count-mass)

Not only do count-mass nouns not fully adhere to the properties of mass nouns, in many cases count-mass nouns explicitly pattern with count nouns and not mass nouns:

⇨ Schwarzschild (2009) shows that count-mass nouns combine happily with *stubbornly distributive predicates,* patterning with count nouns but crucially not mass nouns:

(13) a. The boxes are small and square.
b. The ducks are large.

(14) a. #The water is large.
b. #The sand is round.

(15) a. The furniture is large.
b. The mail is small and square.

⇨ We similarly see count-mass nouns patterning with count nouns and not mass nouns in comparative contexts (Bale & Barner 2009). Comparatives used with count nouns and count-mass nouns are based on number (16,17), but mass nouns require judgements based on some measurement (volume, length, etc), and do not allow for number (18):

(16) John has more ducks than I do.
✔ if John has three ducks and I have one.
✘ if John has two 6kg ducks and I have three 1kg ducks.

(17) John has more furniture than I do.
✔ if John has three pieces and I have one.
✘ if John has one grand piano and I have three small barstools.

(18) John has more water than I do.
✔ if John has six litres of water and I have two litres.
✘ if John has six 1 litre bottles of water and I have one 10 litre bottle.

In Dutch, we see morphological evidence too. Classifiers can replace a null count noun when answering a question, in which case the form is *stuks* (piece+GEN), and not *stukken* (piece+PL):

(19) A: Hoeveel boeken neem je mee? (Dutch)
how.many books take you with
'How many books are you taking?'

B: Twee stuks/*stukken.
two piece.GEN/piece.PL
'Two (books).'

If a mass noun is questioned, we get the opposite:

(20) A: Hoeveel kaas heb je gegeten?
how.much cheese have you eaten
'How much cheese did you eat?'

B: Twee stukken/*stuks
two piece.PL/piece.GEN
'Two pieces.'

When Dutch count-mass nouns combine with a classifier, they tend to use the genitive form, rather than the plural form:

(21) drie stuks/*stukken vee
three piece.GEN/piece.PL cattle
'Three head of cattle.'

If we compare all the properties of mass vs count vs count-mass nouns in English and Dutch[1], we see that with respect to grammatical properties (the top four rows in the table), count-mass nouns pattern with mass nouns. With respect to semantic properties (bottom four rows), count-mass nouns pattern with count nouns.

(22)

Property	Mass nouns	Count-mass nouns	Count-nouns
Combine with plural morphology?	✘	✘	✔
Countable?	✘	✘	✔
Count-quantifiers?	✘	✘	✔
Mass-quantifiers?	✔	✔	✘
Count-divisive?	✔	✘	✘
Stubbornly distributive predicates?	✘	✔	✔
Comparison by number?	✘	✔	✔
Comparison by measurement?	✔	✘	✘

⇨ It thus seems wrong to classify count-mass nouns as either mass nouns or count nouns, since they show variable properties depending on what domain we're looking at:

(23)

	Language	
	English	Dutch
Morphology	Mass	Mass
Semantics	Count	Count

3. Count-mass nouns in Purépecha

Vázquez-Rojas (2012) argues that there is a similar tripartite system in Purépecha, an isolate language of Central Western Mexico.

There is a clear count-mass distinction in Purépecha. Count nouns are able to be counted by numerals, whereas mass nouns are not:

(24) Taní-mu acháati-icha (count)
three-SUM man-PL
'Three men.'

(25) *eshe-s-ka=ni taní-mu yurhirhi (mass)
see-PFVE-1/2IND=1SG.SUBJ 3-SUM blood
Intended: 'I saw three stains of blood.'

[1] Ignoring for the time being the morphology on the Dutch *stuks* vs *stukken*.

Secondly, count nouns obligatorily occur with plural morphology, but mass nouns cannot:

(26) Taní-mu acháati*(-icha) (count)
three-SUM man-PL
'Three men.'

(27) *yurhíri-icha wichu-iri-i-s-ti (mass)
blood-PL dog-GEN-COP-PFVE-3IND
Intended: 'This blood (these stains of blood) is the dog's.'

Finally, there is a quantifier split in Purépecha between quantifiers that only occur with count nouns, and quantifiers that only occur with mass nouns. In the following, *wánikwa* (many) is shown to be a count quantifier (28) but *kánikwa* (much) a mass quantifier (29):

(28) Eróka-sha-p-ka wánikwa/*kánikwa k'wirípu-icha-ni. (count)
wait-IMPFVE-PST-1/2IND many/much person-PL-OBJ
'I was expecting a lot of people.'

(29) Churhipu kánikwa/*wánikwa juka-h-i itúkwa-(*icha). (mass)
soup much/many have-PFVE-3IND salt-PL
'The soup has a lot of salt.'

There is an identical mass/count contrast between *namúni-tu* (few) which quantifies over count nouns, and *sáni-titu* (little) which quantifies over mass nouns:

(30) Jam-sïn-di=ksï namúni-tu/*sáni-titu tíndi-cha cosina-rhu. (count)
be.around-IMPFVE-3IND=3P.SUBJ few-DIM/little-DIM fly-PL kitchen-LOC
'There are a few flies in the kitchen.'

(31) Jatsi-ku-∅ sáníti-tu/*namúni-tu itúkwa (churípu-ni). (mass)
have-APPL-IMP little-DIM/few-DIM salt soup-OBJ
'Put a little salt in the soup.'

⇨ So, Purépecha has a clear mass/count distinction.

It also has a group of count-mass nouns. These nouns are separate form the previous two classes in that plural marking is optional:

(32) Indé tatáka sapí juka-htsï-h-ti ambusï(-cha-ni). (count-mass)
DEM man little have-HEAD.LOC-PFVE-3IND louse/lice-PL-OBJ
'This child has lice on his head.'

(33) Shaníni(-icha) etsákurhi-sha-ti. (count-mass)
corncob-PL spread-PROGR-3IND
'The corncobs are spreading.'

The count-mass nouns can also be counted, but again plural marking is optional:

(34) a. Taní-mu tsúntsu(-icha) bárru-iri. (count-mass)
3-SUM cup-PL clay-GEN
'Three clay cups.'

b. Taní-mu kurhúcha(-icha). (count-mass)
3-SUM fish-PL
'Three fish.'

Again, however these are different from count nouns in the numeral constriction, they can optionally appear with classifier phrases, but count nouns cannot:[2]

(35) Paku-a-s-ka-ni=ya tanimu ichákwa chkari naná Camerí-ni. (count mass)
take-DIST-PFVE-1/2IND-1SG=ADV three CL.LONG wood HON Camerina-OBJ
'I already took three logs to Camerina.'

(36) *Jáma-sha-ti=ksï tanímu ichákwa/erhákwa tsïtsïsï-cha. (count)
be.around-PROGR-3IND=3PL three CL.LONG/CL.ROUND wasp-PL
intended: 'There are three wasps flying around.'

Interestingly, the count-mass nouns of Purépecha combine with the count quantifiers *wánikwa* and *namúni-tu*, and are unable to appear with the mass quantifiers *kánikwa* and *sáni-titu*:

(37) Wíchu wánikwa/*kanikwa jukarha-h-ti tsiri(-icha)
dog many/much have-PFVE-3IND flea(-PL)
'The dog has a lot of fleas.'

(38) Í wéshurin=ksï namúni-tu/*saní-titu p'iku-s-ka shaníni(-icha-ni)
DEM year few-DIM/little-DIM harvest-PFVE-1/2IND corn.cob(-PL-OBJ)
'This year I harvested few corncobs.'

So, if we take the grammatical properties of count-mass nouns of Purépecha into account, they pattern with count nouns.[3]

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[2] At least only rarely.

[3] Classifiers do not go with mass nouns in Purépecha, so are not a mass property.

Data to do with comparison judgements are not available. But, there is semantic evidence that count-mass nouns are interpreted like count plurals, with minimal parts in their domain.

⇨ Firstly, the classifier phrase in (35) (and the other two in Purépecha) are analyzed as stubbornly distributive predicates by Vázquez-Rojas, which show the presence of atomic subparts.

⇨ Secondly, count-mass nouns are well formed in collective predicates that require atomic members in the domain:

> **Context: A pile of corncobs is in the patio, drying under the sun. As children walk by it and mess with the pile, some of the corncobs scatter and spread over the patio.**

(39) Shaníni(-icha) estsákurhi-sha-ti.
corncob-PL scatter-PROGR-3IND
'The corncobs are scattering.'

Mass nouns (both substance and liquid) do not appear with *etsákurhini.*

So, we can see that in Purépecha, count-mass nouns are interpreted like count nouns as well, with atomic subparts.

(40) Grammatical properties of count-mass nouns in English and Purépecha.

	Count-mass nouns		Count nouns	Mass nouns
	English	Purépecha		
Combine with plural morphology?	✘	✔	✔	✘
Countable?	✘	✔	✔	✘
Count-quantifiers?	✘	✔	✔	✘
Mass-quantifiers?	✔	✘	✘	✔

4. Interim summary and back to Link (1983)

Link (1983) proposed that the difference between count nouns and mass nouns is that the former have atomic domains, whilst the latter have non-atomic domains. Were this correct, it provides a restrictive definition of what it means to be "mass".

The count-mass noun class of English has always been a problem for this approach and has spawned a variety of counter-proposals to Link's insight.

If Link was correct, the properties of *furniture* are a total surprise, since they clearly have identifiable minimal parts.

Chierchia (1998, 2010) proposes that all nouns, both count and mass have atomic parts as part of their denotation, but mass nouns are different from count in that their minimal parts are only vaguely specified.
⇨ But, it is hard to see how *furniture* would have a more vaguely specified minimal part than any count noun.

⇨ **The paradox is that Link's approach seems to miss count-mass nouns, and Chierchia's approach fails to predict a true difference.**

Non-lexicalist approaches (for instance Borer 2005 and related recent work) similarly struggle with how to account for the properties of count-mass nouns.
⇨ Borer does not deal with them, but they are a clear problem for her theory, since they are clearly divided, yet their incompatibility with count syntax suggests that they can't be.

⇨ Bale & Barner extend Borer's framework to provide an account of count-mass nouns. However, in their theory the count-mass distinction is only meaningful in a morphological sense. There is no united semantic criterion that unites mass nouns and count-mass nouns, since there are mass nouns with minimal parts and mass nouns without minimal parts. So, the count/mass distinction is only a real distinction on the surface.

Purépecha seems to provide an argument against this, since grammatically count-mass nouns appear to pattern with count-nouns, and clearly not with mass nouns.[4]

This leaves us with the following situation of count-mass nouns:

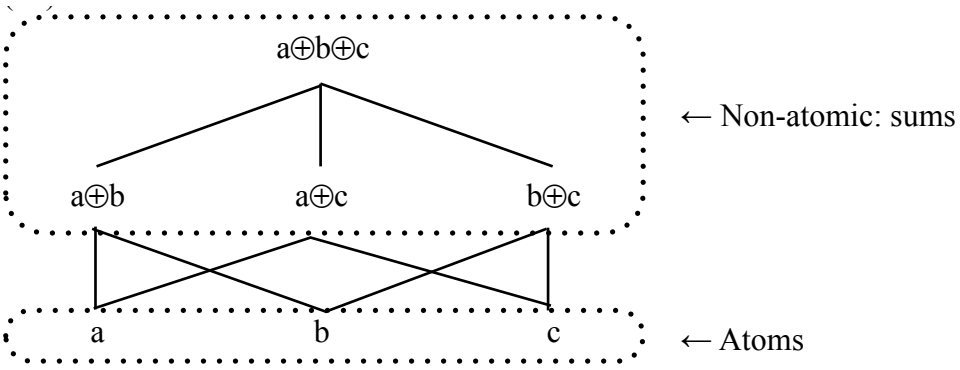
(41)

	Language		
	English	Dutch	Purépecha
Morphology	Mass	Mass	Count
Semantics	Count	Count	Count

⇨ I will propose that it is possible to save a restrictive notion of masshood, and argue that any noun that is interpreted as non-atomic is a mass noun.

[4] This is not to say that Bale & Barner's approach cannot be modified to account for the difference between Purépecha and English. One could play with function domains parametrically and get the required explanation. In English count-mass nouns are within the domain of the identity function (mass head), but not the individuating function (count head). It could be the case that inherently divided noun roots are within the domain of the individuating function (presumably trivially) in Purépecha, but not the identity function of the mass head. This still fails to explain the optionality of plural marking on count-mass nouns in Purépecha however.

(42)

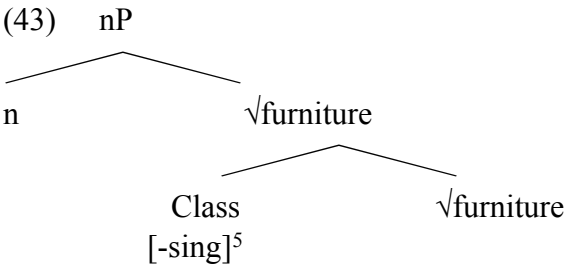


This argument relies on being able to show that the shaded region in the table in (41) is an illusion. The properties that make count-mass nouns in English and Dutch look grammatically mass must all arise independently, and not from some feature/head [mass].

⇨ I propose that an inherent specification for semantic number (plurality) for count-mass nouns (see Chierchia 1998) is responsible for this illusion. Inherent number prevents the merger of NumP to nP (it being vacuous, since number is already present).

I adopt the following structure, where inherent classificatory information is present on a class head (see Kihm 2005, Harbour 2007, 2011a)

(43)



5. The problem of inherent number

I propose that the reason that count-mass nouns in English are unable to be counted is that their inherent specification for semantic plurality prevents NumP (where numerals are located) from merging. This is motivated from the interaction of *pluralia tantum* with numerals.

[5] This feature will be revised to [-atomic] below.

If we look at *plurale tantum* nouns, we see that cross linguistically, it is not rare for them to be uneasy in combination with numerals.[6]

In English, in order to be counted they must appear with some kind of classifier phrase:

(44) a. *I went to the store and bought two trousers.
b. I went to the store and bought two *pairs of* trousers.

In Russian (and other Slavic languages), the paucal numerals 2-4 do not combine with *plurale tantum* nouns (Pesetsky 2012), instead their collective variants are used (glossed *quant*):

(45) èt-i posledn-ie dvo-e strašn-yx sutok (Russian)
these-NOM.PL last-NOM.PL two(QUANT)-NOM terrible-GEN.PL 24h-GEN.PL
'These last two terrible days.'
(*any variant with paucal *dv-a*)

Note that there isn't anything cognitively implausible against *pluralia tantum* being counted. In some languages e.g, French (E. Mathieu, p.c.) counting *pluralia tantum* is fine (if perhaps prescriptively bad in some cases). Even in languages which must employ a collective numeral to count *pluralia tantum,* counting is possible if another form is available.

⇨ For instance, Serbo-Croatian, like Russian, does not allow paucals to be counted. But, some Bosnian dialects have adjectival numerals, which combine felicitously to count them:[7]

(46) četvere hlače (Bosnian)
four.ADJ pants
'Four pairs of pants.'

⇨ There is thus nothing wrong with counting *pluralia tantum,* but it seems as though in some cases the presence of an inherent number specification prevents regular numerals from combining with the noun.

Suppose this is true for English, then we explain why count-mass nouns cannot be counted.
⇨ They already have a number specification, which prevents the head that introduces numerals to merge.
⇨ So, the lack of countability is not related to them not making available minimal parts like regular mass nouns, but arises independently.

[6] In addition to the English, Russian and (Bosnian)-Serbo-Croatian examples, a similar phenomenon happens in Finnish (Hurford 2003), Faroese (Thráinsson et al 2004) and Icelandic (Gísli Rúnar Harðarson p.c.) amongst other languages

[7] Thanks to Aida Talić (p.c.) for this data.

Similarly, we can explain why count-mass nouns cannot take plural morphology. They are only encoded for *semantic* plurality, and are deficient in a specification for *morphological* number. Therefore, they will get pronounced singular as default, since there is no way for the morphological specification to be introduced.

⇨ Again, count-mass nouns are not incompatible with plural morphology by virtue of being 'mass' but because their inherent number specification prevents an introduction of morphological plurality.

So what about Purépecha?

We can posit a minimal difference between languages like English and those like Purépecha. All that needs to be said is that an inherent number specification does not prevent NumP from projecting in Purépecha. Then we predict that numerals should be able to combine with count-mass nouns, and plural morphology should be optional.[8]

⇨ As shown above, both of these predictions are borne out.

6. Quantifiers

So far, two out of the three morphological properties of count-mass nouns that make them appear to be mass nouns have been independently explained away on the assumption that their having an inherent number specification prevents them from combining with a NumP.

The remaining question is how to explain how they combine with mass quantifiers.

Note that this is straightforwardly (and elegantly) explained on the assumption (see Bale & Barner 2009) that the mass/count distinction is created contextually by mass and count heads, and quantifiers are either sensitive to the count head, or the mass head.

⇨ But, this is too coarse for our purposes here. If count-mass nouns really are surface mass only by illusion, then we need a way for mass quantifiers to be compatible with mass nouns, and a subset of non-mass nouns (i.e. count-mass).

6.1. Harbour's (2007, 2011a,b) typology of number and the creation of mass/count

Work by Daniel Harbour proposes that the number features of universal grammar directly translate to lattice-like representations. That is, for all the attested number systems (singular/

[8] It also predicts that, all else equal, *pluralia tantum* (if it exists in the language) ought to be countable in Purépecha. This data is not available to me, but it is a clear prediction of the analysis.

plural/dual/trial/augmented/minimal...), they are derived from number features that encode notions like atomicity and so can be directly interpreted by the semantics and morphology.

The feature of interest here is [±atomic], which characterizes languages with a singular vs plural distinction, such as English and Purépecha.

(47) singular = [+atomic]
plural = [-atomic]

(48) [+atomic] = λP.λx.P(x) ∧ atom(x)
where atom = x is an atom if there is no y≠x, such that y < x and P(y) = 1.

Atoms of a predicate are therefore indivisible. If an atom is split into its component parts, they no longer satisfy the predicate.

Since number features are judged relative to a notion of atom, it must be the case that atomic parts are available to be judged. Suppose then that number features are the cue for the semantics to define a part of the undivided extension of the nominal root into what counts as an atom in context (see Rothstein 2010 on the importance of context).

⇨ Count nouns are then nominal roots that have combined with number features. In the usual case the features are introduced through NumP, but they are also able to be inherently specified on the noun.

⇨ Mass nouns result from the combination with a privative feature [mass], which is an explicit instruction to the semantics that an atom can't be picked in context, since whatever part of the extension is picked, there will always be a subpart of it that will still satisfy the predicate.

(49) [mass] = λP:∀x[P(x) → ∃y[P(y) ∧ y≠x ∧ y<x]]

6.2. Quantifiers and (non)predictable plurality

Harbour (2011a) also shows that universal grammar must be sensitive to a difference between a feature that is positively specified, negatively specified and that is absent.[9] For our purposes then, there is a discernible difference between [+atomic], [-atomic] and [0atomic].

[9] At least within the realm of number. Harbour motivates this claim against the backdrop of inverse agreement interactions with the noun classes of Kiowa and Jemez (Kiowa-Tanoan languages, spoken in Oklahoma and New Mexico respectively), which classify nouns by their number properties (like grammatical gender).

I propose that count-mass nouns in English and Purépecha are inherently [-atomic]. This translates in the semantics to a denotation with sums, but crucially also atomic subparts, just like regular plurals.

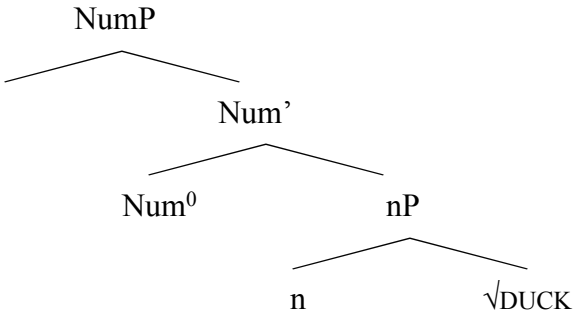
Semantic plurality in the regular sense is able to be left unspecified. Semantically, the plural is the unmarked form (see Sauerland 2004, 2008, Sauerland et al. 2005, Bale, Gagnon & Khanjian 2011). It is then predictable information, so if we assume underspecification, it can be omitted.[10]

Within the syntax, we have the following number specifications (*u*F = morphological, *i*F = semantic features, see Smith 2012):

(50) singular count: [# *u*F:__ , *i*F:+atomic]
plural count: [# *u*F:-atomic, *i*F:__]
count-mass: [# *u*F:__ , *i*F:-atomic]
mass: [mass]

These feature specifications are introduced by NumP[11], onto the nP, apart from the count-mass specification, which is introduced as in (43) above:

(51)



This now gives us flexibility to capture the different combinations of quantifiers vs nouns.

⇨ In Purépecha it is simple, mass quantifiers *kánikwa* and *sáni-titu* are only compatible with nouns that are specified for [mass].

Since count-mass nouns are not specified for [mass], they are never predicted to combine with mass quantifiers.

In English it is trickier. We cannot say the same as we did for Purépecha, since that would leave us with count mass nouns going with count quantifiers, contrary to fact.

[10] At least within the syntax. Whether or not this holds within other domains of the grammar I leave open.

[11] [mass] could well be a different head from NumP, since in the system I am assuming NumP most basically introduces atomicity. I don't see that anything important rests on this here.

(52) *Quantifiers to be accounted for in English*

singular count:	each, every	
plural count:	all, many, few	
plural + mass:	most, more	
"mass" only:	much, little	(includes mass and count-mass nouns)

However, if we assume the following combinatory restrictions of quantifiers in English, we can capture the distribution of quantifiers.

(53)

each, every	⇔	[+atomic]
all, many, few	⇔	[0atomic]
most, more	⇔	[0atomic ∨ -atomic ∨ mass]
much, little	⇔	[mass ∨ -atomic]

For now I'm leaving the theoretical explanation of this somewhat speculative, but simply point out here that this is what we're looking for: it's a way of grouping count-mass nouns with mass, but without them having come from the same feature.

⇨ One possibility is that upon merging into the structure, the quantifier must enter into an Agree relation (Chomsky 2000, 2001) with the noun that it is quantifying over. The quantifiers above look for the relevant features and if they find them, the derivation is able to converge, and crashes otherwise.

7. Conclusions

⇨ In this talk I have shown that count-mass nouns are not mass nouns semantically, they pattern with count nouns with respect to minimal parts.

⇨ Further, I have show that in Purépecha, the class count-mass patterns grammatically with count nouns.

⇨ The moral of the story is that we should be careful drawing any deep conclusions on the notion of 'mass' when considering count-mass nouns. More research needs to be done of course, but whether they fall into the category of mass nouns looks to be arbitrary, suggesting those that do, do so by coincidence.

⇨ I have also shown that even whilst predicting the semantics of count-mass nouns, it is possible to have a contextually created mass/count distinction, characterized in terms of atomicity/ minimal parts (Borer 2005, Wilhelm 2008, Bale & Barner 2009).

⇨ Using independently motivated features of UG ([±atomic]), we may be able to return to Link's insight that mass/count is characterized in terms of atomic vs non-atomic interpretations.

Appendix - [+F vs -F vs 0F]

Class	[±singular]	[±augmented]	[±group]	Language
SII	+	-	0	Kiowa / Jemez
	+	0	0	
SIS	+	0	+	Jemez
SIP	+	0	-	Jemez
SSS	-	+	+	Kiowa / Jemez
PPP	-	+	-	Kiowa / Jemez
	0	+	-	
IIP	-	+	0	Jemez
	0	+	0	
IDI	-	-	0	Kiowa
IDS	-	0	+	Kiowa
IDP	-	0	-	Kiowa
	-	0	0	
SDI	0	-	0	Kiowa
SDS	0	0	+	Kiowa
SDP	0	0	-	Kiowa
	0	0	0	
IIS	-	0	+	Jemez
III	-	-	0	Jemez

The above table, taken from Harbour (2011a) shows that a negatively specified feature is distinct from the absence of a feature. The data represent how the 14 possible noun classes of Kiowa and Jemez are created. If '-F' and '0F' were the same, then the top two shaded boxes would create the same agreement class and so would the bottom 5 boxes. However, with the +F, -F and 0F distinction we are able to predict all (and crucially only) the nouns classes that arise.

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http://homepages.uconn.edu/~pws10003

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