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Lexical nouns are both +MASS and +COUNT, but they are neither +MASS nor +COUNT

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2.1 Introduction: Informal accounts of +MASS and +COUNT

Many of the writings on the mass/count distinction, whether they are from the ESL literature, the descriptive grammar literature, or the more theoretical linguistics literature, explain this distinction by mentioning some paradigm examples. It will be said that the lexical words:

(1) [+MASS] water, blood, air, sand...

are +MASS, whereas:

(2) [+COUNT] person, dog, tree, house...

are +COUNT. Sometimes, although not always, it is also pointed out that some 'abstract' nouns are +mass and others are +count:

(3) [+ABST, +MASS] advice, knowledge, curiosity, software...

(4) [+ABST, +COUNT] suggestion, belief, apology, program...

And sometimes it is mentioned that complex noun phrases are also to be categorized mass/count:

(5) [+MASS] dirty water, red blood that is on the floor, too much justification...

(6) [+COUNT] tall person, big dog that is sleeping in the corner, each house on the street...

although the majority of the literature discusses mass/count only as it occurs with lexical nouns.¹

Works on the distinction as it occurs in English typically add a few syntactic conditions that distinguish +*MASS* from +*COUNT*:

- (7) a. Count nouns, but not mass nouns, have plural forms and thus can agree with plural verbs.
 b. Count nouns, but not mass nouns, can occur with numerals and counting phrases.
 c. Singular count nouns, but not mass nouns, employ the quantifiers *each*, *every*, (stressed quantifier) *some*, and indefinite *a(n)*.
 d. Plural count nouns, but not mass nouns, employ the quantifiers *few*, *several*, *many*.
- (8) a. Mass nouns, but not count nouns, do not have plural forms and thus all verb agreement is singular.
 b. Mass nouns, but not singular count nouns, can occur with measure phrases like *liters of*, *amount of*.
 c. Mass nouns, but not count nouns, employ the quantifiers *much*, *little*.
 d. Mass nouns, but not singular count nouns, employ the unstressed *some* and the quantifier *most*.

And finally, there are a number of semantic features about +*MASS* vs. +*COUNT* nouns that should hold in any language. They should hold cross-linguistically because these features are taken to characterize either the reality that the nouns denote (externalism) or the mental item that is occasioned by the term (internalism), depending on the semantic theory under consideration. In either case they not seen as describing aspects of a language. For example,

- (9) a. Count nouns, but not mass nouns, designate a set of (countable) *entities*.
 b. Mass nouns, but not count nouns, designate *stuff*.

There are two basic approaches to theories of +*MASS* nouns: one takes the syntactic criteria as basic while the other takes the semantic criteria as basic, in their way of making the mass/count distinction. Of course, each thinks that the other criterion will naturally follow from the one they choose as basic. But as we will see, this just does not happen.²

¹ There is also a literature on extending the distinction to lexical verbs and to verb phrases, but we will not follow that up here. See works on 'eventology', e.g. Mourelatos (1978), Bach (1986a,b), for this extension.

² There are also some who think these two rationales for calling some lexical noun +*MASS* or +*COUNT* somehow reach a *détente*. For instance, a theory might declare the semantic criteria 'really' to be syntactic,

2.2 +MASS and +COUNT as syntax

Many descriptive grammars of English, e.g. Quirk et al. (1985), give a syntactic characterization of the mass/count distinction within the category of noun. That is, they view the fact that some noun (e.g. *water*) is a mass term as giving an explanation for why some combinations with other words are ungrammatical. For example, they might put forward the criteria in (7) and (8) as the rationale for classifying the paradigm examples cited above in (1–6).

The +COUNT/+MASS features are viewed by Quirk et al. and others of this syntactic persuasion to be a part of the lexical characterization of the nouns. These features are to be inherited from the lexical items into the larger and larger syntactic units that are present in extended phrases. So, *blood* as a lexical entry contains the syntactic feature +MASS, and this is inherited by the common noun phrases (CNPs) *bright red blood* and *bright red blood that is on the floor* and the full determined phrase *the bright red blood that is on the floor*. The fact that this longer phrase is also +MASS is what ultimately explains why

- (10) a. *The bright red blood that is on the floor are slippery.
 b. *Each bright red blood that is on the floor is slippery.

are ungrammatical. ((10a) is ungrammatical because the subject phrase being +MASS prohibits it from being plural, as (8a) says, and hence the agreement with the verb phrase fails. (10b) is ungrammatical because the determiner *each* is not allowed to combine with the +MASS common noun phrase *bright red blood*, as (7c) says.) Violations of the constraints involving +MASS and +COUNT yield ungrammatical results that have the same status as other syntactic violations; (10a) and (10b) are no more a part of English than are

- (11) a. *Person now rash.
 b. *That fact the because.

2.3 +MASS and +COUNT as semantics

Some descriptive grammars of English, e.g. Huddleston and Pullum (2002), think of the mass/count distinction as a description of the semantic properties of the denotation of the terms. In this type of view, mass meanings contrast with count meanings because of (9). In turn, this general semantic categorization has some more particular manifestations in the meanings of lexical items:

and that some nouns will be treated as (syntactically) +MASS or +COUNT on account of the original syntactic reasons while others will be treated as (syntactically) +MASS or +COUNT on account of these new reasons. See Wiltschko (this volume) for treating \pm BOUNDED in this manner.

- (12) a. Mass meanings are *divisive in their reference*; count meanings are *true of a unit as a whole*.
 b. Mass meanings are *cumulative in their reference*; (singular) count meanings are *not true of groups of that which they are true of*.
 c. Stuff that mass meanings are true of *cannot be counted*; count meanings are true of *individuated items that can be counted*.
 d. Stuff that mass meanings are true of *can be measured*; (singular) count meanings are *not measurable*.

Some theorists take the divisiveness and the cumulativeness conditions together to be called the *homogeneous in reference* condition.

The fundamental difference between mass and count terms is that count terms are true of *objects*—entities that are distinct from each other even while being of the same type, and thus one can distinguish and count them—while mass terms are true of *stuff* that is undifferentiated with respect to the term being used to describe it. This in turn explains why mass terms, unlike count terms, are *divisive* in their reference: they permit something that the mass term is true of to be arbitrarily subdivided and the term to be true of these parts as well. Taking the water in the glass to be something that *is water* is true of, it can be divided into parts and *is water* will be true of both parts. And again, mass terms, unlike count terms, are also *cumulative* in their reference: putting the water contained in two glasses into a bowl yields something of which *is water* is true. But the same is not the case with a count term like *dog*. Chopping up a dog does not yield more things of which *is a dog* is true, nor do two dogs make a thing of which *is a dog* is true.³

In a semantic approach, the features +MASS/+COUNT are descriptions of the semantic value of lexical nouns and the larger CNPs and the still larger determiner phrases (DPs) and noun phrases (NPs), etc. Thus, they do not figure in the syntactic well-formedness constraints of a grammar, but would emerge as a description of what the semantic values of the embedded nouns are, and how these semantic values get altered by the syntactic combination of those nouns with other words. In such a picture, these features do not syntactically rule anything out; the most that can be said is that certain combinations are ‘semantically anomalous’, and hence can’t be interpreted. According to the semantic theory, the violations alleged by the syntactic theory are ‘really’ a consequence of the fact that ‘it wouldn’t make any sense’ to try to interpret the violations. For example, trying to interpret ‘each mud’ is impossible because ‘each’ requires a domain of entities but ‘mud’ doesn’t provide such a domain.

³ Other than in a Frankenstein-like scenario.

As with the syntactic version of +MASS/+COUNT, in the present semantic theories, the lexicon supplies individual words with a set of syntactic features and also a set of semantic values. Larger and larger phrases that contain the noun also contain the semantic information mentioned in the lexical items, modified in accordance with rules that describe the semantic effect of being syntactically combined in the manner that is employed. In this type of theory, sentences that violate the ‘appropriateness’ of the semantic features of +MASS and +COUNT are seen as grammatical but not interpretable. So the sentence (10b) would not be ungrammatical for using an ‘individuating quantifier’ with a mass noun phrase—it would only be ‘uninterpretable.’ (10a), on the other hand, would be marked as syntactically ill-formed, this time on the grounds that the singular subject has a number mismatch with the verb phrase.

The difference between +MASS/+COUNT as syntax and +MASS/+COUNT as semantics thus is whether these features are seen as syntactic well-formedness constraints that yield ungrammaticality when violated or as semantic interpretability constraints upon syntactically correct sentences that yield semantic anomaly when violated.

2.4 Problems with the syntactic approach

The syntactic approach is, well, syntax-driven. The lexical items are assigned either a +MASS or +COUNT feature, and this feature controls the syntactic admissibility or inadmissibility of larger phrases. But there are many words that have both mass and count meanings, for instance:

- (13) a. Concrete terms
- (i) a lot of chocolate / many more chocolates
 - (ii) more discipline / an academic discipline
 - (iii) too much paper / write a paper
 - (iv) drink beer / drink a beer
- b. Abstract terms
- (i) much discussion / three different discussions
 - (ii) much justification / many justifications
 - (iii) a lot of difference / two differences
 - (iv) much more data / many more data

The examples in (13) are just the tip of the iceberg. There are many more of the ‘dual life’ terms which have been illustrated in (13) above, sometimes forming regular patterns, but sometimes not:

- (14) Mass terms used ‘countily’:
- a. Pinot Noir is *wine* / Pinot Noir is *a wine*
 - b. Kim produces *sculpture* / Kim is producing *a sculpture*
 - c. Sandy likes *lamb* / Sandy likes *every lamb*
 - d. *Beer* on the table / Three *beers* on the table / Eight *beers* on tap
- (15) Count terms used ‘massily’:
- a. Leslie has more *car* than *garage*
 - b. Chis Pronger, 6’6” worth of *ice-hockey defenseman*...
 - c. He’s got *woman* on his mind
 - d. What a hunk of *man*!
 - e. Some people like *data* better than *theory*

As Huddleston and Pullum (2002: p.335) remark ‘the dual use of chocolate is not remotely exceptional but is representative of an extremely widespread phenomenon’, and they follow this with a list of 25 examples chosen over a wide variety of types of nouns that illustrate just how wide-spread is the phenomenon of a noun having two equally-salient meanings where one is +MASS but the other +COUNT.

And then there’s the ‘universal grinder’ of Pelletier (1975), which is like a meat grinder except that it can accommodate any object, no matter how large, and its teeth are so powerful and fine that it can grind anything, no matter how strong. One inserts an object that falls under any (concrete) count noun into one side... for example, a hat. Push the button, and the result is that there is hat all over the floor.⁴ Another push of the button and we can have book all over the floor. An unfortunate accident might generate curious cat all over the floor.

One might also think of ‘universal packagers’ in this regard, that take any item of which a mass term is true and convert it into an object. Any time there is a use for a particular type of some mass then there can be a count term that describes it—for example, *a finely-silted mud*, which can be a name for a type of mud and also a predicate that is true of all individual exemplars of this type. And if there is a standardized amount of *M* that is employed in some use, then there will be a count term that describes this amount, such as *a beer* or *an ice cream*. Furthermore, there seems always to be a count use for any alleged mass term *M*, meaning (roughly) *a kind of M*. Putting all these together, a term like *a scotch* could be true of individual servings (thus being independently true of each piece of the actual matter in the various glasses), or true of the different standardized amounts (so that two instances of the same standard one-ounce serving count as only one such standardized amount), or true of the different kinds of scotch on the table or available at the bar. Thus any of ‘one’, ‘three’, ‘five’ could be true answers to the question ‘How many

⁴ This is true despite the fact that we might have some other term, e.g. *felt*, that also describes what is on the floor.

scotches are on the table?', when the table contains five glasses poured from three different kinds of scotch, each glass containing the standard double shot.

These considerations show that the appropriate theory needs to talk about *meanings* of terms, or *uses* of the terms, or maybe *occurrences* thereof (some occurrences are +MASS, others of the same word are +COUNT). But then this is no longer a syntactic account. And the syntactic approach just doesn't work. For, it will turn out that since *any* noun can be either mass or count, a +MASS/+COUNT syntactic distinction does not work; *nothing* is ruled out purely by the syntactic rules involving +MASS and +COUNT.

2.5 Problems with the semantic approach

As we have seen above, many or most or almost all nouns have both a natural mass and a natural count sense. So the basic lexical item that gets entered into a phrase structure description of a sentence will be one of these senses. It is never very clear how this is supposed to be effected in a grammar, but we will not pause over that here, and simply assume that there is some way that this can be done. But even if we can assume this, there nonetheless seem to be some serious difficulties that are semantic mirrors of the difficulties found in the syntactic approach.

Many formal semanticists (e.g. Link 1983, Chierchia 1998a,b, Pelletier and Schubert 1989/2003) take the characteristics in (12) to be best accounted for in terms of a semi-lattice theory. A semi-lattice has no lowest elements and is atomless. The idea is that anything that *water* might be true of has subparts—things in the lattice that are its parts—of which *water* is also true; and any two elements in the *water*-lattice find a joined element also in the lattice that represents the merge of those two elements.

But it should be noted that many mass terms obviously are not atomless in the sense required by this theory. Consider:

- (16) *furniture, cutlery, clothing, equipment, jewelry, crockery, silverware, footwear, bedding, toast, stemware, gravel...*

Clearly there are atomic parts of these, and yet they are considered mass terms by any of the traditional grammars. So it cannot be an atomless mereology that accounts for the mass nature of these words; and by extension, since it doesn't account for the mass nature of these particular words, there seems to be no reason to think it is responsible for the mass nature of *any* words.

Some theorists, e.g. Huddleston and Pullum (2002), take this as evidence that terms like those in (16) are of a different nature than what we have been calling 'mass terms', and are to be treated differently. Huddleston and Pullum call them 'aggregate terms' and semantically distinguish them from other mass terms by virtue of their being true of 'very different sorts of things'. The idea is that *furniture*, for example, is

true of sofas, chairs, tables, carpets, and so on, and that these are ‘very different’ from one another. But a true mass term, for example *blood*, is really true only of one kind of thing.

But one might still wonder: are there *any* words at all that obey the condition on divisiveness? Or put another way, are there really any words that are atomless—whose referent has no smallest parts? Doesn’t *water*, for example, have smallest parts: H₂O molecules perhaps? Certainly *coffee* and *blood* have smallest parts,⁵ as do other mixtures. A standard defense of the divisiveness condition in the face of these facts is to distinguish between ‘empirical facts’ and ‘facts of language’. It is an empirical fact that water has smallest parts, it is said, but English does not recognize this in its semantics: the word *water* presupposes infinite divisibility.

It is not clear that this is true, but if it is, the viewpoint suggests interesting questions about the notion of semantics. If *water* is divisive but water isn’t, then water can’t be the semantic value of *water* (can it?). In turn this suggests a notion of semantics that is divorced from ‘the world’, and so semantics would not be a theory of the relation between language and the world. But it also would seem not to be a relation between language and what a speaker’s mental understanding is, since pretty much everyone nowadays *believes* that water has smallest parts. Thus, the mental construct that in some way corresponds to the word *water* can’t be the meaning of *water* either. This illustrates a kind of tension within ‘natural language metaphysics’.⁶

Further problems with the semantic approach to the mass-count distinction come from the fact that there are pairs of words where one is mass and the other is count and yet the items in the world that they describe—or in the minds of speakers using the terms—seem to have no obvious difference that would account for this. On the intuitive level, it seems that postulating a *semantic* difference should have some reflection in the items of reality that the terms designate (or in the mental life of speakers using the terms). But this is just not true. There seems to be nothing in the *referent* (or speaker-beliefs/intentions) of the following mass vs. count terms that would explain how they should be distinguished, as they intuitively are (see McCawley 1975 for further examples).

- (17) a. Concrete terms
- (i) baklava vs. brownies
 - (ii) spaghetti vs. noodles
 - (iii) garlic vs. onions
 - (iv) rice vs. beans

⁵ At least, there are volumes that contain coffee, and there are subvolumes of such a volume which are so small that they do not contain coffee. And so some sort of ‘continuity principle’ suggests that there is a cut-off line or interval that yields smallest parts of coffee.

⁶ For a description of, and defense of approaching metaphysics this way, see Bach (1986a,b).

- b. Abstract terms
 - (i) success vs. failures
 - (ii) knowledge vs. beliefs
 - (iii) flu vs. colds

To many, these examples and their surrounding facts have seemed to prove that the linguistic features of +COUNT and +MASS do not have any backing in reality. Nor any backing in people's intuitive understanding of *when* a word will be +MASS or +COUNT nor *what it is* for a word to be +MASS or +COUNT.

2.6 Evaluation, and a flaw in common

Sections 2.4 and 2.5 have presented a litany of problems with the two general approaches. I wish to point the direction to the kind of theory that can avoid the listed difficulties. In particular, I want to avoid the syntactic approach's use of syntactic features that don't ever make any construction be ungrammatical. And I want to avoid the semantic approach's view that the (alleged) violations are not syntactic claims, for example its claim that *three water* is just 'semantically anomalous' and not syntactically ill-formed. I also would like to challenge the semantic approach's claim that there is some deep ontological backing to the distinction between +MASS and +COUNT, and challenge the internalist view that there is some deep conceptual backing to the distinction.

What the syntactic and semantic views have in common is that they make +COUNT/+MASS be features of lexical nouns. It could instead be a 'constructional feature' introduced when CNPs are formed into DPs and NPs. My goal is to have syntactic features that give rise to ill-formedness when violated, and to have semantic consequences follow from these constructions. These semantic consequences could be described in terms of some semantic features that somehow mirror the syntactic ones.

2.7 A different approach

In this section I'll lay out an approach that honors what I think is right about the syntactic approach and what I think is right about the semantic approach, but which avoids the flaws of both. The overall view is that lexical nouns are neither mass nor count, but that they are both mass and count. The next two subsections explain how this can happen.

2.7.1 *Lexical nouns are neither +MASS nor +COUNT*

Syntactically speaking, the proposal is that lexical nouns do not have any syntactic marker for +MASS or +COUNT, but the phrases they occur in can become marked

either +MASS or +COUNT. An example, simplified and not containing any other factors than mass/count, goes like this:⁷

- (i) *beer* lexically lacks any syntactic feature of +MASS/+COUNT.
- (ii) *dark beer*, *beer on the table* (CNPs) lack any syntactic feature of +MASS/+COUNT.
- (iii) *beers* (a CNP) has the syntactic feature +COUNT.
- (iv) *is beer* (PRED) has the syntactic feature +MASS.
- (v) *a beer*, *many beers* (NPs) have the syntactic feature +COUNT.
- (vi) *sm beer*, *a lot of beer*, *beer* (DPs/NPs) have the syntactic feature +MASS.

+MASS and +COUNT are not lexical features: no lexical item has them. An alternative way of putting this is that lexical nouns are *unspecified* for the syntactic features +MASS/+COUNT. In this way the existence of ‘dual life’ nouns is no problem—there aren’t any, really. Instead, sometimes the noun syntactically composes to form a larger phrase that is +MASS, sometimes it forms one that is +COUNT. *Chocolate*, for example, is neither +MASS nor +COUNT, but composed with *a* to form *a chocolate*, the resulting NP is marked as +COUNT; when composed with *much* to form *much chocolate*, the resulting NP is marked +MASS.

As well, the observed syntactic violations that are attributed to violations of the restrictions on +MASS and +COUNT are honored: they do in fact occur, and the violations are just as described—except that the violations are caused by these features as they occur on longer phrases, not in the lexical items. Thus

- (18) *much honeys

is bad because *honeys* has been marked +COUNT à la (iii) and (as the syntactic approach had already alleged in (8) above), *much* cannot be combined with +COUNT on syntactic grounds. This can hold even though

- (19) a. most honeys
 b. most honey
 c. much honey
 d. most honey that comes from clover

are perfectly fine NPs. These examples show that in this theory, determiners like *much* and *most* can combine with a lexical noun (unspecified for +MASS/+COUNT) to generate an NP that does have one of the features, as in (19a),⁸ (19b), and (19c);

⁷ One aspect I will skip over here is whether +MASS and +COUNT exclude one another. The suggestion being made here assumes they do, but it could easily be modified to allow that some complex phrases could be syntactically marked with both +MASS and +COUNT.

⁸ Actually, in (19a), the unspecified-for-mass/count lexical noun *honey* is pluralized, yielding *honeys*—which is marked +COUNT. As remarked in (8d), *most* can combine with singulars to produce +MASS, but can also combine with plural +COUNT (and the result will be +COUNT).

and they can also combine with CNPs, where they will inherit the feature of the CNP, as in (19d). Of course, when the feature of the CNP violates the agreement feature of the determiner, as in (18), this generates syntactic ill-formedness. It is difficult to see how this could be accommodated in a theory of syntactic +MASS/+COUNT lexical features, except by having a stable of syntactic coercion rules that changed +MASS to +COUNT and conversely. But that's just a bad syntactic idea. I think the examples of section 2.4, as well as the apparent viability of the present approach, show that the syntactic +MASS/+COUNT features just shouldn't be associated with the lexical nouns, but rather ought to be 'constructional' in nature—introduced in the construction of larger phrases.

2.7.2 *Lexical nouns are both +MASS and +COUNT*

As discussed in section 2.3, semantic theories take the point of view that +MASS and +COUNT are ways of describing the semantic values of terms. If a term's semantic value exhibits the properties identified in the first clauses of the criteria listed in (12) above, then we say that the term is +MASS; if it exhibits the features identified in the second clauses of those criteria, then we say the term is +COUNT. These semantic categorizations do not themselves feature into well-formedness considerations; rather, it is just a matter of brute semantic fact that certain semantic properties cannot be combined with other semantic properties. The attempt to do so results in a 'semantic anomaly'.

The theory being developed here holds that the semantic value of every lexical noun contains *all* the values of which the noun is true. Thus, since a noun such as *chocolate* is true of some individual candies as well as of the stuff of which they are made, both of these meanings will be identified as parts of the semantic value of the lexical noun *chocolate*. For concreteness, I'll employ the usual semantic value of terms identified as +COUNT—namely, the set of things of which it is true (or a function on possible worlds that picks out the set of chocolate candies in that world). And for a mass meaning, I'll adopt the view that it is a semi-lattice structure (atomic or non-atomic, depending on the noun) or an 'ensemble' or a mereology (atomic or non-atomic). There is no necessary commitment to these for semantic values in either the +COUNT or the +MASS case, although I do think they are plausible. So the semantic value of the lexical noun *chocolate* would be the union of the set of individual chocolate candies and the semi-lattice of chocolate.

Of course, we wish to preserve semantic compositionality. When the lexical noun *chocolate* is syntactically combined with the determiner *a* to form the NP *a chocolate*—and recall that this entails adding the syntactic feature +COUNT to the NP—the semantic rule that corresponds to this syntactic combination has the effect of *deleting* the mass part of the meaning of the lexical *chocolate*. That is, the resulting semantic value of *a chocolate* now contains only the set of individual pieces of

chocolate candies, and not the semi-lattice of chocolate. In turn, this means that the description of the semantic value of *a chocolate* obeys the semantic characteristics of +COUNT.

This strategy is different than semantic ones prevalent in the literature. Standard views take one or another of the +COUNT or +MASS meanings as basic, and then expect the semantic rule to construct the other one upon demand. For example, if the +MASS notion of *chocolate* were taken as basic, then the semantic rule we have been discussing would have to construct the correct meaning of ‘set of individual pieces of chocolate candies’ out of the semi-lattice of chocolate. However, in the strategy being advocated here, rather than trying to perform some sort of type-shift or a coercion or a construction of a related meaning, all these values already are part of the lexical meaning of *chocolate*. And the effect of the semantic rule—indeed, the semantic rules for all the different syntactic combinations—is to delete some aspects of the lexical item’s semantic value from consideration in the current syntactic context. In this way, the meanings of lexical items are both +MASS and +COUNT.

I have already remarked that a great number (the vast majority?) of nouns have both a ‘natural’ count meaning and a ‘natural’ mass meaning. These are the nouns that I was calling ‘dual nouns’ (and their paired meanings ‘dualities’). Furthermore, the universal grinders and packagers show that at least the non-abstract nouns have these sorts of mass and count meanings already embedded within their semantic values, needing only some appropriate context to become highly salient. We discussed the example of *beer*, in whose extension we find not only the semi-lattice of beer, but also individual servings of beer, standardized types of individual servings of beer, kinds of beer, and perhaps other types of values as well. In the present proposal, all these will be part of the semantic value of the lexical item *beer*.

In more general terminology, the proposal for lexical semantic value is this. Given a [−ABST] lexical noun *N*, its (extensional) semantic value, $\mu(N)$, would be (something like):

$$(20) \quad \mu(N) = \{N^o \cup N^m \cup N^s \cup N^{ss} \cup N^k \cup \dots\}$$

that is, the union of all the things of which it is true. (N^o represents the objects that are *N*; N^m is the material that *N* is true of; N^s are the standard servings of *N*; N^{ss} are the standard sizes of servings of *N*; N^k are the kinds of *N*; etc.)

The present proposal is a step of taking away some information from the lexicon: all syntactic count/mass information appears only in more complex phrases, and thus lexical nouns are neither +MASS nor +COUNT in the present proposal. But the proposal is also a step towards adding more information in the lexicon: the semantic values of *all* the different uses of a noun become part of the lexical semantic value. The characterization of the semantic values of nouns can be said to be both +MASS and +COUNT because typical nouns have both semantic notions true of (different) parts of the semantic value.

It may be the case that there are some lexical nouns that have no +MASS meaning—*piece* or *hole* are perhaps examples. And there may be some that have no +COUNT meaning—perhaps *stuff* is such a noun. The semantic value of these lexical nouns then would correctly be described as being just one of +COUNT or +MASS, and not both. But they would still be classified as neither +MASS nor +COUNT in the syntactic sense, because those syntactic features are introduced at the level of the CNP or NP.

Of course, it is not really true that lexical nouns are neither +MASS nor +COUNT in the same sense in which they are both +MASS and +COUNT. The former sense is syntactic, the latter sense is semantic. For clarity we should subscript or otherwise indicate which sense we are discussing, whenever the topic of whether some piece of language is or isn't +MASS/+COUNT (we might use +MASS_{syn} vs. +COUNT_{syn} and +MASS_{sem} vs. +COUNT_{sem}, for example).

2.8 Related proposals

The approach most closely related to the present one is in Allan (1980), especially his main motivation of 'countability is a subcategory of the NP, not of nouns'. However, the general framework within which Allan is working is influenced heavily by generative semantics, and the syntactic features of complex phrases are sometimes generated from semantic features of its parts. For example, Allan thinks that there are 'eight levels of countability' that attach to bare nouns, and that these levels of countability 'can be incorporated into well-formedness conditions on English grammar'. So this general picture does not have a separation of the syntactic and semantic notions of +MASS/+COUNT in the way that the present proposal does, and its concept of a semantics seems much more 'impressionistic' than is common in today's semantic theories.

The theory of +MASS/+COUNT in Borer (2005) is a purely syntactic theory without any semantic aspect at all (although it does seem possible to graft a semantic theory onto the proposal). Like the present theory, Borer's theory also has lexical items be marked as unspecified for +MASS or +COUNT, meaning of course that they do not have +MASS_{syn} or +COUNT_{syn}. But unlike the syntactic aspect of the present theory—where these features are added to the syntactic description of a more complex phrase when it is constructed from the simpler parts—Borer's theory has the addition of one or another of these syntactic features occur as part of the morphology of words, and not as part of the syntactic composition of syntactically larger phrases from smaller ones within the syntax of a sentence.

The theory offered in the seminal articles Chierchia (1998a,b) is at heart a semantic proposal. ('The mass/count distinction concerns the *extension* of predicates', Chierchia 1998b: p.355.) He offers a characterization of the languages of the world in terms of two 'semantic parameters': \pm ARG and \pm PRED, depending on whether the language allows its nouns (and NPs) to have the semantic value of an argument

(for common nouns, this means to take the semantic value, Kind) or to be interpreted as a predicate (with the semantic value of a property). These interacting parameters classify the world's language into three types; the possibility of $-ARG/-PRED$ is not seen as possible because this 'would prevent NPs from having any interpretation at all' (Chierchia 1998b: p. 353). In Chierchia's hands, this outlook on the interpretation of nouns in semantically different types of languages has implications for the way the nouns have to be represented in the lexicon. In $+ARG/-PRED$ languages, 'all nouns are going to be, in some sense, mass'. He also reasons that there will be no singular/plural distinction in such languages, and that numerals will be unable to modify nouns directly but will require a classifier. Mandarin is cited as such a language. Languages that are $-ARG/+PRED$ 'should disallow bare nominal arguments altogether. Moreover... some nouns will have a count extension, while others will have a mass one', and French is cited as an example. In $+ARG/+PRED$ languages, 'lexical entries can either denote kinds or predicates... and their phrasal projections can be freely shifted back and forth'. (Much of the relevant difference between $-ARG/+PRED$ and $+ARG/+PRED$ languages concerns the type of bare nouns that are allowed, and the way they are to be interpreted.) $+ARG$ lexical nouns will have mass denotations; $+PRED$ lexical nouns will have a set of atoms as its extension, and hence be count.

The present proposal differs from this in three ways: first, it does not attempt to derive mass and count interpretations of nouns from more general semantic properties; second, it finds a place for $+COUNT_{syn}$ and $+MASS_{syn}$, and does not consider all $+MASS/+COUNT$ interactions to be semantic; and third, it does not employ the tactic of assigning one or another of a $+MASS_{sem}$ or $+COUNT_{sem}$ to the lexical nouns and then deriving the other meaning by means of some type-shifting operator when the linguistic context calls for it.

Bale and Barner (2009a) propose that the semantic values of lexical items are 'underspecified' with respect to count/mass, by which they mean that lexical items do not have either the syntactic $+MASS/+COUNT$ features nor can their semantic values be characterized by the semantic properties of $+MASS/+COUNT$. But their rule that interprets such an underspecified lexical item as it occurs in 'a mass noun syntactic frame' is the identity function. So: in reality their lexical items are not underspecified: they have mass meanings, and all count meanings are constructed in the relevant syntactic frames. So, like the present proposal, Bale and Barner's proposal removes the syntactic $+MASS_{syn}/+COUNT_{syn}$ features from the lexicon, and introduces them 'in construction'. But the semantic side of their proposal has all lexical meanings be $+MASS_{sem}$, and the $+COUNT_{sem}$ feature be coerced from them in the appropriate syntactic constructions. As I have remarked earlier, I think this type of coercion is quite difficult to describe with any accuracy, given the numerous different ways that $+MASS$ and $+COUNT$ meanings are related.

Chierchia (2010) is a development, or perhaps an alteration, of the views in Chierchia (1998a,b). In this work, the treatment of $+MASS/+COUNT$ in the world's

languages is again divided into three types. But now the divisions classify the languages differently, and the emphasis on \pm ARG/ \pm PRED is dropped. (We look at his classification a bit more in section 2.9 below.) The emphasis in his 2010 article is on the *vagueness* of the interpretation of atomic parts of mass terms. Chierchia's general proposal is that all nouns have atomic parts, instances of the extension of the noun such that its subparts are not in the noun's extension. But for a number of nouns, it is vague as to what the atomic parts actually are. In light of this vagueness, Chierchia opts for the semantic technique of supervaluation to give the appropriate interpretation of certain types of sentences involving these mass nouns. Although this view concerning the vagueness of what are atomic parts of some mass nouns could be added to the 'mass part' of the semantic value of some nouns in my proposal, other aspects of Chierchia's proposal—such as the classification of some nouns as +MASS and others as +COUNT, and the extensive use of type-shifting to account for dual uses of almost every noun—are not a part of the present theory.

2.9 Cross-linguistic comments

Chierchia (2010) gives a very helpful three-way division of how various languages deal with the +MASS/+COUNT (syntactic) distinction. According to this division, the world's languages fall into one of the following three groups with regards to +MASS/+COUNT. First, there are number marking languages, which have overt number features that obligatorily appear on nouns. Here the +MASS/+COUNT distinction applies to the nouns directly. (Most?) Indo-European languages, e.g. English, are such languages. Next, there are classifier languages, which do not have obligatory number marking on nouns (and arguably do not have a singular/plural contrast at all on nouns). Lexical nouns in such languages have been viewed as +MASS in some influential works,⁹ but there is a +MASS/+COUNT distinction in these languages that is active more generally, and for this reason it might be better to view the lexical nouns as unspecified for +MASS/+COUNT). The classifiers in these languages enforce the +MASS/+COUNT distinction, but at the level of an entire 'classified noun phrase'.¹⁰ (Most?) Asian languages (whether related or not), e.g. Mandarin, Japanese, and Korean, are such languages. Finally, there are languages that lack both obligatory number marking and obligatory classifier systems. Various Amerindian languages, e.g. the Canadian Dene Słliné, various South American languages, e.g. the Brazilian Karitinan and Yudja, and perhaps some Austronesian languages are such languages. Some of these languages can plausibly be seen as having a +MASS/+COUNT distinction, albeit on somewhat different bases than the foregoing languages. For others, it seems that there simply is no such distinction reflected in the language—whether the distinction is seen as semantic or syntactic.

⁹ E.g. Krifka (1995), Chierchia (1998a,b), and others.

¹⁰ See Cheng and Sybesma (1999) for an influential article arguing this viewpoint.

The present proposal is aimed at number-marking languages. But it might be noted that the proposal has the effect of bringing number-marking languages more into line with classifier languages, in that the +MASS/+COUNT distinction happens at a level of syntactic complexity that is larger than lexical nouns: e.g. at the level of CNP and NP, in the present proposal. Thus, under the current proposal, lexical nouns are unspecified for +MASS_{syn} and +COUNT_{syn}, just as in the classifier languages, and instead these features are introduced ‘in construction’. The difference between number-marking languages and classifier languages thus lies simply in the differing syntactic constructions that introduce the syntactic features. Number-marking languages introduce the feature +COUNT_{syn} in pluralization and in combination with certain determiners, and they introduce +MASS_{syn} in combination with other determiners. Classifier languages, on the other hand, introduce +MASS_{syn} or +COUNT_{syn} in construction with the different classifier phrases. But the result is the same: it is the syntactically more-complex constructs that are +MASS or +COUNT, and not the lexical nouns.

This manner of looking at the ways that number-marking and classifier languages treat the +MASS_{syn}/+COUNT_{syn} features brings the two categories of languages very much closer together than Chierchia’s initial description would suggest. And indeed, much closer than most descriptions of the +MASS/+COUNT phenomena of the two language families has ever suggested. The languages that are neither number-marking nor classifier form a diverse group. In many of these languages it seems that there is no syntactic clue as to whether a sentence involving a noun should be understood as +MASS or as +COUNT. And either semantic understanding is plausible when looking at just the sentence out of context. It is then up to ‘the context’ to determine which it is. But in such a case, it is not right to say that the *language* is employing such a distinction. Whatever the distinction among such language users, it is to be on a different basis than the way it works in number-marking and classifier languages (see Lima 2010a, Müller et al. 2006, Wilhelm 2008).

2.10 Further advantages

Section 2.8 outlined various proposals in the literature that have some similarities to the present scheme. But although there are these similar proposals, I think there are some advantages of the present idea over them.

For one thing, my view acknowledges the extensiveness of ‘dual meanings’: although there may be a few lexical items that can’t be used ‘massily’ — *piece* or *hole* (?) — and a few that can’t be used ‘countily’ — *stuff* (?) — almost all can be used in both ways. Not only can they be in fact used in both ways, in a very, very large number of cases both meanings are equally ‘natural’. These dual-use nouns form a primary reason to adopt the current proposal. Syntactically speaking, the only two alternatives to saying that such nouns are neither +MASS nor +COUNT are either to

proliferate entries in the lexicon (noun *X* with the syntactic feature +COUNT and a duplicate entry for *X* with the syntactic feature +MASS) or else to engage in syntactic type-shifting (where some syntactic rule changes the +COUNT_{syn} feature to +MASS_{syn}, and conversely). Neither of these alternatives seems very appealing, especially when one emphasizes the naturalness of both meanings of the dual-use nouns. In the theory as presented, the +MASS_{syn} and +COUNT_{syn} features that are introduced in construction actually do some syntactic work: certain constructions are deemed syntactically ill-formed because of violations of the restrictions that these features enforce. This is in contrast to the theories of syntactic features that can *always* be converted from +MASS to +COUNT, and conversely. It is also in contrast to those semantic theories that locate the ‘oddness’ of certain constructions as a kind of semantic clash between +MASS_{sem} and +COUNT_{sem}.

And against theories that have a unified lexical entry but mark ‘different senses’ of the noun as +MASS vs. +COUNT, there is no need in the present approach for any fancy semantic operations such as ‘grinding’, ‘packaging’, semantic type-shifting, or other ‘coercions’. Nor need there be any ‘magic’ in choosing or describing which of the different senses will be employed in some particular sentence. (Note that, in theories employing ‘different senses of the same word’, if one is describing a sentence that employs a dual-use noun, then to accurately state which of the different meanings is being utilized one needs to look to larger parts of the sentence that contain the noun. That is, it becomes necessary to look *beyond* the word itself and to the larger context in which it occurs. But that is a violation of semantic compositionality, and should be avoided if there is an alternative available.)

As against the approach of Allan (1980), there is no attempt to make ‘levels of countability’ be a syntactic phenomenon (which even Allan admitted were individual matters of taste). And as against Chierchia (1998a,b), the present theory does not claim that basic lexical meanings are +MASS, not even in the classifier languages. And so there is no need to have ‘coercions’ that will generate +COUNT meanings from them. And more globally, the theory I am offering does not make any use of Chierchia’s ±ARG/±PRED background theory. As against Chierchia (2010), there is no necessity of saying that the notion of object vs. mass (what are the atomic parts of mass terms) is ‘vague’—although one could; and so there is no need for unusual semantic techniques like supervaluations.

As opposed to Bale and Barner (2009a), lexical values *really* are underspecified (and also, of course, overspecified) in my theory: they are not ‘really’ mass-meanings that are to be ‘coerced’ into count-meanings in certain environments. In general, and as opposed to Chierchia and to Bale and Barner, my approach is not a semantic approach—violating the +COUNT or +MASS agreement features is a *syntactic* error. In general, and as opposed to Allan and to Borer, there is (or can be) a legitimate semantics for the lexicon which works compositionally with the syntax, and one need not buy into any of the other parts of their theories.

Finally, it should also be emphasized that, on the semantic side, the present theory's view that lexical nouns are both +MASS and +COUNT allows it to avoid the semantic coercion operations that convert one to the other. And there is no need to try to determine which of the meanings is 'really' basic and which one is 'really' a secondary coercion. Rather, associated with certain of the syntactic rules is a semantic rule that has the effect of *deleting* some of the semantic values of the lexical items. So, instead of trying to *generate* or *create* new senses out of old ones using semantic coercion rules, we have all the possible meanings stored in the lexicon and simply carve out the ones that are relevant in some syntactic case or other. This seems a much cleaner way to accommodate the set of semantic facts that surround the facts of the near universality of the +MASS/+COUNT alternations.

2.11 A final philosophical remark

In philosophy, much has been made about the difference between stuff and things, substance and substances, gunk and atoms. The relationship between these ontological distinctions and the linguistic distinction of +MASS and +COUNT was initially brought to philosophers' attention in Strawson (1959), using the terminology of 'sortal predicates' and 'feature placing terms' for (some) +COUNT and (some) +MASS nouns, respectively. (Sortal terms are 'terms that provide a principle for distinguishing and counting individual particulars' while feature-placing terms 'provide a fundamental basis that is presupposed even by sortal predications.' Strawson's examples of feature placing predications are *There is water here*; *Snow is falling* and the like, which makes it clear that he has some subset of mass terms in mind for this.)

I'm not opposed to such metaphysical distinctions, and indeed think they mark an important difference. But I am a skeptic about whether there is any useful information to be gained about the distinction by looking at the +MASS/+COUNT distinction in language—*any* language, even English, which apparently is Strawson's idea of a logically and ontologically perfect language.¹¹

At the very least, philosophical writers who wish to employ this sort of feature to bolster the philosophical conclusions ought to take a much wider group of languages into account than just English and its 'number marking' relatives.

¹¹ Mei (1961) challenged Strawson's account of 'the description of "our" conceptual scheme' by pointing to Chinese as a case where the sortal/feature-placing distinction doesn't work as Strawson claimed. 'Strawson exploits facts peculiar to languages like English... In Chinese, Strawson's criteria are inapplicable', Mei said. 'Strawson's silence [about other languages] must either mean he thinks that all other languages conform to English in these ways or that English is the paradigm of all languages... What justification can Strawson offer for this act of linguistic imperialism?' Furthermore, '[Strawson employs] Aristotelian arguments based upon the peculiarities of English and its relatives... [Strawson's notion of] "assertive ties", and subject-predicate "congruence" only works for languages with sufficient inflection.'