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## **Plural mass nouns and the compositionality of number**

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## 1. INTRODUCTION<sup>1</sup>

The most intriguing thing about plural mass nouns is that, according to received wisdom, they should not exist. If a noun is plural, it refers to a plurality; a plurality by definition consists of individual elements; individual elements can be counted and distributed over; hence, a plural noun should be count as opposed to mass. This is what generally happens:

- |  |              |
|--|--------------|
| (1) <i>Three / (how) many / numerous / *(how) much</i>   | <i>books</i> |
| (2) <i>*Three / *(how) many / *numerous / (how) much</i> | <i>water</i> |

The trouble is, some plural nouns are not count:

- (3) *Three garments / \*clothes / coals / \*ashes / purchases / \*groceries*

It is true that, as is well known since Allan (1980), mass and count are best seen as preferences rather than absolute values for lexical items; for instance, *clothes* cannot be governed by a numeral, but it tolerates the count quantifier *a few*. Even so, the existence of plurals that, at the very least, share some properties with mass nouns, raises questions about the chain of reasoning I have sketched out above. In fact, the assumption that plural nouns must refer to collections of individuals is simply wrong, even in languages where the number category would appear to correlate straightforwardly with the contrast between one and more than one. My first goal here will be to substantiate this empirical claim (section 2). Secondly, I will address in section 3 a theoretical question that cannot even be posed, let alone answered, without realizing that plural nouns can be non-count: the relation between semantic and morphological structure in mass plurals, whose interpretation does not seem to accord with the interpretation of the plural affix. How can a noun modified by this affix fail to denote non-singleton sets and still retain a compositional interpretation?

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The answer is that mass plurals are indeed semantically plural, but they refer to manifold complexes of non-individual parts. The familiar one-many contrast of *book* vs. *books* is not a primitive, defining trait of plurality, but a consequence of the semantics of the noun and of the way plurality combines with it. Variation along either of these two dimensions can bring about different readings—which are the empirical concern of this paper.

## 2. TYPES OF MASS PLURALS

### 2.1. Evidence for non-count plurals

Let us first of all examine the characteristics of a plural like *books* in connection with the count-mass distinction. Semantically, *books* is true of non-singleton sets of individual entities, each of which is a book. Like all plurals, *books* shares with mass terms several interpretive properties, the most prominent being cumulative reference: if *books* is true of a set of books, it will also be true of a larger set of books, just like *water* preserves identity when applied to larger and larger amounts of water. The singular *book*, on the other hand, does not show cumulative reference, because it must refer to single entities and not to sets. The opposite of cumulativity is divisibility, or the property to preserve identity for smaller and smaller parts (Pelletier and Schubert 1989, Bunt 1985, Moltmann 1997, 16-19, 106). All mass terms have divisible reference, in the sense that if an amount of stuff is water, a smaller amount will still be water (by contrast, a part of a book is not a book). But they are not indefinitely divisible, in so far as the referent is conceptualized as having minimal parts. Terms denoting substances, like *water*, have been analysed either as atomless or as having a minimal part structure (see especially Chierchia 1998 for the latter position); but in any case mass terms also include nouns like *footwear* or *furniture*, which undoubtedly have minimal parts (a splinter or a table leg are not *furniture*). Reference to collections of discrete elements links plurals like *books* to this latter class of mass terms, which have been called collective masses (Link 1998, 214, Bunt 1985, 304); this is where the similarities of count plurals and mass terms end.

Syntactically, *books* is plural, unlike *footwear* or *furniture*; it can be governed by numerals above 1 and by plural determiners like *a few*, *several*, *many*, *numerous*, which describe the size of sets in non-cardinal terms; and the size of the set can be questioned by means of the interrogative determiner *how many*. Moreover, *books* can be the internal argument of predicates like *to count* and of prepositions like *between*, which apply to a

plurality by making reference to its individual members (Moltmann 1997, 61-91); contrast in this respect *between the books* or *he counted the books* with the ungrammatical *\*between the book collection* or *\*he counted the book collection*, even though *the books* and *the book collection* may well have the same denotation. Finally, plural nouns like *books* support reciprocal anaphora: *the books resemble each other* contrasts with *\*the book collection resembles each other*. In all these respects, a plural noun like *books* is count in the sense that it allows reference to the single discrete individuals that make up its denotation, as indication of set size, as arguments to predicates or as antecedents for the grammatically singular reciprocal *each other*.

The main indication that plurals like *clothes* are different is their ungrammaticality with numerals: see (3) above. For this reason alone such plurals must be kept distinct from the ‘pure’ count plurals exemplified by *books*. Several plural nouns are like *clothes*, *ashes* and *groceries* in disallowing numerical modification:

(4) *\*Three belongings / furnishings / arrears / cattle / suds*

Others are uncountable for most but not all speakers; from here on, I will use the diacritic % for constructions unacceptable for some but not all speakers:

(5) *%Three oats / embers*

As has been noted, *a few clothes* is acceptable but *\*three clothes* is not; more generally, some plurals that disallow numerical modification tolerate other count determiners, subject to strong lexical, dialectal and idiolectal variation:

(6) *A few cattle / clothes*  
*%belongings / %embers / %oats*  
*\*arrears / \*furnishings / \*suds*

(7) *I counted the cattle / clothes*

*%belongings / %embers / %oats*

*\*arrears / \*furnishings / \*suds*

(8) *These cattle / %clothes resemble each other*

*%belongings / %embers / %oats*

*\*arrears / \*furnishings / \*suds*

As Allan (1980) made clear for English, such variability is the rule rather than the exception for nouns that cannot be numerically modified. He also noted that plurals can be uncountable, an observation anticipated in the philosophical literature by Cartwright (1970, 25):

“Groceries are ...” is right; at any rate, “groceries is ...” is wrong. But “two groceries” is wrong too, and I at least am quite unsure about “many groceries”.

However, the subsequent semantic literature has largely ignored this empirical fact, treating plurality as a mark of countability. This is apparent in Chierchia’s (1998, 70) contention that mass nouns are inherently plural and for that reason cannot be pluralized, or in Moltmann’s (1997, 87) characterization of the selectional properties of predicates like *to distinguish* as “selection of plural as opposed to mass NPs”. As can be seen, a plural like *groceries* patterns with the singular mass *rice* rather than with the count plural *rice grains* (diacritics refer to the intended interpretation):

(9) *John cannot distinguish the rice grains*

*\*John cannot distinguish the rice*

(10) *\*John cannot distinguish the groceries*

To summarize, mass plurals exist. Dialectal variation and the variable acceptability of certain count determiners like *several* or *a few* are interesting properties that require explanation, but they cannot be used to claim that all plurals are count.

## 2.2. Mass plurals beyond *pluralia tantum*

All mass plurals considered so far are *pluralia tantum* (\**an arrear*, \**every arrear*), and part of the dialectal variation has to do with the availability of a singular for some speakers in sentences like *this is an oat*. The connection between lack of a singular and lack of countability is very tight; however, the mass interpretation does not depend on a noun lacking the singular.

Firstly, nouns like *scissors* and *trousers* have no singular but one would hesitate to call them mass terms. It is true that (in most dialects) these nouns resist direct modification by a numeral: contrast \**three scissors* / \**trousers* with *three pairs of scissors* / *trousers*. But their semantics is quite different from that of mass terms, both substance nouns like *water* and collectives like *furniture* or *cattle*. *Scissors* and *trousers* refer to complex wholes, not just to their parts: a heap of loose scissor-blades (notice the “singular” in compound) does not qualify as scissors. This means that morphosyntactic plurality in this case is compatible with a semantically singular reading; *scissors* is a collective predicate, true of a single entity (one pair) as well as of a plurality of such entities (many pairs), but not of loose parts not organized into such single entities (a heap of scissor-blades). By contrast, *cattle* refers to a plurality and not to a single collective entity. Both nouns are plural, and neither can be counted; however, a plural phrase like *my scissors* refers to a singular bounded referent just like the count *my car*, as opposed to the mass *my water* or *my cattle*. Hence, a noun may be a *plurale tantum* without being mass.

Secondly, the mass interpretation is available to many nouns that are not *pluralia tantum*. The following examples show that even count nouns with a semantically regular opposition of singular and plural can have an additional interpretation for the plural form:

- |      |                 |  |
|------|-----------------|--|
| (11) | <i>fund</i>     | ‘sum of money set aside for a purpose’ |
|      | <i>funds</i>    | ‘more than one fund’                   |
|      | <i>funds</i>    | ‘money set aside for a purpose’        |
| (12) | <i>holiday</i>  | ‘festive day or period of time’        |
|      | <i>holidays</i> | ‘more than one holiday’                |
|      | <i>holidays</i> | ‘festive time’                         |

- (13)
- |                  |                                       |
|------------------|---------------------------------------|
| <i>resource</i>  | ‘commodity available for use’         |
| <i>resources</i> | ‘more than one resource’              |
| <i>resources</i> | ‘complex of things available for use’ |

Other examples include *crops*, *plans*, *foundations*, *preparations*. The second plural sense emerges clearly in examples like *these funds were earmarked* (referring to a single amount of money), *the summer holidays* (seen as a single uninterrupted period), or *I used up my resources* (meaning I used up all my money). The plural in these cases does not describe multiple instances of the singular, but rather amounts to a recategorization of the singular as a mass term. One can say *I have plans for tonight*, but when the same plural appears in *I have a few plans for tonight* its sense is different, and the difference systematically involves the mass-count contrast.

*Rains* or *depths* exemplify the slightly different case of mass plurals whose singular is already mass. They too resist numerical and individualizing quantification: *the Autumn rains* is acceptable, but *\*a few Autumn rains* is not. Plural here does not have the packaging function it has in a cases like *wine / three wines*, but contributes the information that the referent is articulated in manifold parts, whose nature depends on the noun’s interpretation. *The Autumn rains* refers to multiple raining events during Autumn, making up a manifold mass entity whose parts, although possibly disjoint in time, are not individual enough to be autonomously referred to as *\*one rain*. In the case of *depths* or *heights*, plurality turns abstract properties into descriptions of mass entities: the reference of *depths* is vaguely characterized as “whatever” is deep, which is not the compositional plural of the abstract *depth*. The pair *intricacy* – *intricacies* is another example where the singular can only be abstract (*\*this bit is an intricacy*) while the plural denotes a manifold mass, in this case an intricate one.

If the mass reading for all these plurals is regarded as an additional way to interpret the same lexical entry, as I think it should be, then we must conclude that even plurals that have a singular can be mass. An alternative view consists in analyzing all these mass plurals as separate lexical items lacking a singular, an analysis for which I see no independent evidence apart from the wish to ensure that a count noun remains count when pluralized (see Corbett 2000, 176). In all these cases, the referent remains exactly the same; all that changes is the different conceptualization associated with the second reading available in the plural. Hence, mass plurals are not confined



to *pluralia tantum*, even though most *pluralia tantum* seem to be mass (in English; languages like Russian instead have many *pluralia tantum* referring to countable individuals, such as *troje saney* ‘three sledge.PL.GEN’ and indeed *odni sani* ‘one.PL sledge.PL.NOM’).

### 2.3. The typological context

The misperception that plurals must be count is largely due to the insufficient attention paid by the semantic literature on plurals to languages other than English. I have chosen to start with the English evidence, to avoid giving the impression that mass plurals are only possible in typologically different languages. But the strongest evidence that plurals can be mass comes from other languages.

*Pluralia tantum* provide a rich exemplification. Delbrück (1893, 147-172) and Wackernagel (1926, 86-88) discuss a wealth of examples from Indo-European languages of ancient attestation, grouped in various semantic categories: functionally defined aggregates of humans or deities; clustered celestial bodies; paired body parts; complex (but single) body parts; complex structures; substances; names of festivities; abstracts and reified event properties like Latin *tenebrae* ‘darkness.PL’. In modern languages, *pluralia tantum* are particularly numerous in Slavic, comprising mass terms like Russian *den’gi* ‘money’, *dukhi* ‘perfume’, *opilki* ‘sawdust’, *slivki* ‘cream’ and *khlopoty* ‘trouble’ (Wade 1992, 51). Outside Indo-European, consider class 6 nouns in Swahili, which groups together plurals like *ma-we* ‘stones’, paired to the singular (class 5) *ji-we* ‘stone’, with several plural-only mass terms, such as *ma-futa* ‘oil’, *ma-ji* ‘water’, or *ma-nyasi* ‘grass’ (Contini-Morava 1999; Swahili also has *singularia tantum* mass terms). For the Caucasian language Lezgian, Haspelmath (1993, 81) lists *c’axar* ‘groats’, *kálar* ‘roasted wheat with hemp’, *jarar* ‘measles’ and *p’ip’inar* ‘soot’. For Turkana, Dimmendaal (1983, 211, 224) explicitly says that some mass nouns are only singular and others only plural, the latter including substance names like ‘milk’, ‘water’, ‘blood’, ‘sweat’, ‘soil’, as well as abstracts like ‘shame’. Many more examples can be found; see Corbett (2000, 173-176).

Even more important than mass *pluralia tantum* are mass plurals of nouns that have a singular, like *funds*. Again, the evidence from old Indo-European languages is impressive (cf. Delbrück 1893, 147-172, Wackernagel 1926, 88-96, Meisterfeld 1998, 102-127), showing not only that the phenomenon can be much more extensive than in English, but also that the semantic differentiation between singular and plural does not have to

be confined to the count-mass distinction. A few Latin examples will suffice (see also the literature cited in Corbett 2000, 78-88):

- (14) *frumentum* (sg) ‘wheat as commodity’  
*frumenta* (pl) ‘wheat as crops’

*aqua* (sg) ‘water’  
*aquae* (pl) ‘springwater, water in multiple places’

*arena* (sg) ‘sand’  
*arenae* (pl) ‘sandy surfaces’

Sharifan and Lotfi (2003) have recently investigated the type of contexts favouring singular or plural in Modern Persian for substance nouns like *âb* ‘water’, *berenj* ‘rice’, *royan* ‘oil’ and *šekar* ‘sugar’. Their main result is that speakers favour the plural of these nouns when they are arguments of predicates like ‘to scatter’ or ‘to spill’, or in sentences like ‘wipe away the water from the kitchen floor’; in other words, when the referent must be conceptualized as having a part structure. In particular, notice that a *single* patch of water counts as “distributed” if water is scattered over the floor (Sharifan and Lotfi 2003, 235); plurality requires complexity, but it does not require countable individual parts.

In Syrian Arabic, several mass terms are either exclusively plural, like ‘information’ or ‘money’, or, like ‘oil’ or ‘water’, they admit pluralization “to indicate abundance, variety, or indefinite quantification” (Cowell 1964, 368). Among mass terms that can be pluralized are the “collective” bases for singulative derivation, which derives a count noun (Cowell 1964, 369):

- (15) *samak* ‘fish’, *m<sup>-</sup>o<sup>-</sup>z* ‘wave(s)’      “collective”, singular

*samake* ‘a fish’, *m<sup>-</sup>o<sup>-</sup>ze* ‘a wave’      singulative, singular  
*samak<sup>-</sup>at* ‘fish (pl)’, *m<sup>-</sup>o<sup>-</sup>z<sup>-</sup>at* ‘waves’      singulative, plural

When the base is pluralized, the result is another *mass* noun with a different conceptualization (typically approaching the sense ‘numberless multitude’):

- (16) ?*asmak* ‘many or various fish’                      “collective”, plural  
       ?*amw* <sup>̄</sup>*a* <sup>̄</sup>*z* ‘many or extensive waves’

This happens in Breton too, with a significant twist: the so-called “collective” bases are themselves grammatically plural, but that does not prevent further pluralization, so that the elements in the right column are double plurals (data and interpretations from Trépos 1957, 225):

- (17) *tud* ‘people’ (pl)        *tud-ou* ‘peoples, nations’  
       *dilhad* ‘clothes’ (pl) *dilhaj-ou* ‘suites of clothes; garments’

In the case of *dilhad*, the doubly plural *dilhajou* cancels the sense of cohesion present in ‘clothes’ as garments having a functional relation to each other, while *tudou* has a generalizing function with respect to the simple plural *tud* (only *tud*, for instance, can refer to a specific group of people of definite size). In other cases, the double plural has a clear massifying effect on a simple plural: the singular mass *dour* ‘water’ is pluralized as *dour-you*, which Trépos glosses as ‘streams’; further pluralization with the affix *-yer* (regularly combining with *-ou-* to give *-eyer* in this dialect) produces *dour-ey-er*, described as “des eaux de ruissellement, après les grosses pluies” (Trépos 1957, 232).

Over and above the particular characteristics of single constructions or languages, this typological overview has shown first of all that mass plurals cannot be brushed aside as exceptions. But more importantly, it has also shown that plurality on them is not just a pure grammatical marker void of semantic significance, as explicitly claimed, for example, by Ojeda (1993, 120):

Notice that this incompatibility [between plurality and uncountability PA] is not countered by nouns like *oats*, *clothes*, *news*, *molasses*. As it is readily accepted, these nouns are *pluralia tanta* [sic], their forced plurality thus pertaining only to form, not to content. As a consequence of this, the nouns in question thus do not exhibit true (or semantic) plurality.

This is simply not true. Plural number on mass terms displays a strong tendency to correlate with the conceptualization of the referent as a manifold complex, whether this reflects the internal structure of a referent, its lack of cohesion, its internal articulation imposed by distributive predicates or by spatiotemporal coordinates, or a mixture of all these factors. So, we don't want to say that plural is exclusively a property of atomistic domains and that it has no semantic function when applied to uncountables (Ojeda 1993, 147). But then we face the problem of accounting for the meaning of plurality when it does not denote sets of discrete, countable elements. Let us turn to this problem.

### 3. THE SEMANTICS OF NON-DISCRETE PLURALITY

#### 3.1. The role of plurality on mass nouns

The key observation about mass plurals like *groceries* or *funds* is that they do express plurality, but we don't know exactly what they are plurals of. As opposed to *books*, the interpretation of these nouns does not provide a criterion for deciding what counts as a "part" of their referent (although world knowledge can help considerably, for instance in deciding that a chair is an item of *furniture* but not of *groceries*). The interpretation as manifold complex thus correlates quite systematically with morphosyntactic plurality, but not in the sense that a plural operator "forms" or "selects" set-sized referents based on the referent of the singular. Somehow, the interpretation of these plurals does not proceed bottom-up from that of the singular, but top-down: instead of constructing the interpretation 'many Ns' from the meaning of N, speakers know that nouns like *groceries* and *foundations* refer to manifold entities, and the lexical predicates apply to these complexes rather than to their individual parts. In the case of mass plurals, such complexes are not conceptualized as *individual* entities, unlike truly collective *pluralia tantum* such as Russian *sani* 'sledge'. Note that terms like *finances* or *resources* in their mass reading may well refer to an amount of money small enough to consist of a single note; but even then, their interpretation is something like 'things that make up financial backing', or rather 'whatever makes up financial backing'. The plural 'things' in the paraphrase thus has the value of a general number (Corbett 2000).

This extends to more abstract cases like *rains*, *holidays* or *depths*, in English or in other languages. All of these terms refer more or less vaguely to concepts with an internal spatio-temporal articulation, without a specific indication of the parts involved. Even nouns of substances in languages like

Swahili or Modern Persian fall under this generalization, in so far as their referents lack internal cohesion (most typically liquids and non-cohesive aggregates like ‘sand’ or ‘rice’) but, existing in space and time, are typically experienced as taking on the part structure imposed by the environment. The English *fumes* exemplifies this class. In other words, what makes ‘water’ a more likely member of the plural mass class than, say, *uki* ‘honey’ (which belongs to the singular class 11 in Swahili) is that water is likelier to be perceived as lacking the internal cohesion which would qualify it as “an object”. In this sense, and in this sense alone, continuous substances can be viewed as manifold on a par with complexes of parts.

A clarification is in order: even the most homogeneous, infinitely divisible mass has a part structure, determined by its sub-quantities (but see Cartwright 1970 for discussion). Now, if the referent of every mass noun qualifies as a manifold complex just because it has subparts, we lose what is specific to *plural* mass nouns. But notice that this is where we must make room for variation, both crosslinguistically and within the same language; also, the difference between singular and plural does not in most cases reflect a difference in truth conditions. In order to distinguish ‘mass as a manifold complex’ from ‘mass as a homogeneous substance’, therefore, we need to appeal to a difference in conceptualization, not in ontological properties. The relevant distinction is readily available once we remind ourselves of the distinction between mass nouns like *water* and those like *furniture*. Whether or not substance terms like *water* have minimal parts, terms like *furniture* do. But the part structure of, say, *furniture* and *clothes* differs from that of substances like *gold* or *water*, because it is required by the lexical predicate itself. The sum of all black threads in a suit of clothes is a part of the substance making up the clothes, but it is not an *x* such that a structure of many *x* make up what we call *clothes*; a garment is. Notice that this holds regardless of whether *clothes* refers to one suite of clothes (an individual entity), to several such units, or to clothes as merchandise. In any case, the lexical predicate imposes a part structuring on the referent. Such parts are clearly identifiable individual entities like garments, for *clothes*, or cows, for *cattle*; unsurprisingly, these nouns allow reference to their atomic parts as in *he counted the clothes / cattle* (but they remain uncountable: *\*three clothes / cattle*). Other terms still impose a part structure, but one whose parts cannot be segmented in a non-arbitrary fashion. *Holidays* or *preparations*, for instance, may refer to sets of discrete events, but since events can nest and overlap, no unique definition is possible of what counts as one part in the manifold called *holidays*. For *clothes*, the individuality of each part is well defined but is backgrounded; for *holidays*, it is not unambiguously defined; for mass plurals like *waters* or *funds* (on the reading

‘fund’) there is simply no individuality to the parts. They differ from singular mass nouns like *water* or *money* in their conceptualization alone, which requires the referents to be articulated (in space, time, or function), and not merely to be divisible. Formally, the referents of both *water* and *waters* have a part structure; linguistically, the latter has a different conceptualization. I claim this is reflected in grammatical number.

### 3.2. Parts and individuality

The claim that mass plurals refer to a structure of non-individual parts may seem vague, especially if the lack of individuality is a matter of conceptualization and not of ontology. But the idea that language should reflect individuality as an objective property of referents is a myth anyway, so we shouldn’t be worried by the idea that mass plural impose a part structure without defining what counts as a part. It is well known that count nouns often fail to provide clear criteria for membership in the set denoted by their predicate, although this does not make them less count. Chierchia (1998, 68-71) makes this point using dummy sortals like *thing*, to show that the count-mass distinction does not reflect an opposition between atomistic and non-atomistic reference domains (see also Griffin 1977 for a perceptive discussion). So, the lack of descriptive content for X in a paraphrase like ‘complex of X that together forms clothing / financing / holidaying ...’ is not a problem. Count nouns like *thing*, but also *wave* or *adventure* show that nouns can encode formal properties like being true of discrete entities without making it clear what these entities are.

In fact, the lack of a clear specification for the constituent parts of a manifold structure is a strength, not a weakness. Contrasts like ‘water’ – ‘water all over the floor’ in Persian, or ‘sand’ – ‘sandy places’ in Latin (or *water* – *waters* in English) show that the part structure need not be a property of a lexical item, but can be contributed by the context. Being a matter of degree, being subject to variation, and being relative to a situation are precisely the characteristics that Moltmann (1997) associates with *whole-properties*, as she terms those properties by which what is perceived as a part differs from what is perceived as a whole. Imagine two undivided objects, one a chickpea and the other a half of a split chickpea; ontologically, they are both undivided individual objects, but the whole-properties carried by the noun *chickpea* provides a criterion according to which only the former is a whole. What we describe as a lump of coal, by contrast, does not involve such whole properties, so that there is no opposition between whole and non-whole lumps. We are clearly dealing with a very elusive notion, which cannot be defined too precisely because it ultimately encodes a subjective

way to structure reality (see Moltmann 1997, 24 for discussion and a working definition). What matters is that the independently motivated notions of integrated wholes and whole-properties allow for precisely the degree of fuzziness required by the semantics of plural mass nouns. The conceptualization as complexes of parts that are not individual wholes distinguishes mass plurals from count ones; and the conceptualization as manifold complexes distinguishes them from singular mass nouns.<sup>2</sup>

### 3.3. Compositionality

At this point, the interpretation of mass plurals is clear: they refer to complexes of non-individual parts, i.e. domains articulated in parts that do not have whole-properties. These parts range from individual entities *viewed* as constituting a mass (as in *clothes*), to parts of a continuous mass contextually characterized as having an internal articulation (in spatial, temporal or functional sense). However, it is not clear how this interpretation should come about. The problem is this: we may know that the elements in the denotation of *funds* are conceptualized as non-individual parts, but the singular *fund* does not mean ‘non-individual part of a sum of money’ (and *pluralia tantum* don’t even have a singular); yet these nouns are morphologically plural exactly like *books*; what does the plural morpheme operate on in *funds*, and why does it act differently on *funds* and *books*?

The assumption that the plural is the same morpheme must be made explicit, because it would be easy enough to stipulate two distinct operators in order to derive the semantic asymmetry. But there is no independent evidence that *oats* and *books* (or *funds* in its two readings) involve two distinct affixes. Notice that I am not denying the possibility of mass (or collective, cohesive, ...) plurals having a characteristic morphology; but all

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<sup>2</sup> Like Chierchia (1998), Moltmann (1997) does not consider mass plurals, treating instead all plurals as referring to discrete collections of individuals. She derives the lack of whole-properties for such discrete collections from the fact that their elements are themselves whole (1997, 23). I believe this analysis, although conceived for atomistic pluralities, makes exactly the right prediction for non-atomistic ones: the whole-properties of individual members of a collection *entail* that the collection is not a whole, so lack of whole-properties on parts of a complex *does not entail* this. As a consequence, a complex with non-individual parts may or may not be an integrated whole. This is just what we see: plurals that refer to complexes of non-whole parts include on the one hand cases like *scissors* or Russian *sani* ‘sledge’, which refer to objects conceptualized as integrated wholes, and on the other hand to mass plurals.

the cases we have considered are morphologically identical to count plurals, and positing systematic homophony should be avoided if there are alternatives.

The alternative I see consists in a different way to combine the interpretation of plurality with that of the lexical predicate. This is how Chierchia (1998, 59-60) represents the idea that plurality “must map a set of atoms into the set of pluralities constituted by those atoms”:

$$(18) \text{ For any } A \subseteq U, \text{ PL } (A) = *A - A$$

$U$  is the universe of discourse,  $A$  is a lexical predicate that denotes a set of atomic entities in  $U$  and  $*A$  is the closure of this set under sum formation, that is the set of all sets (or sums, on the rather different philosophical perspective defended by Link 1998) made up of elements of  $A$ . PL in (18) filters out atoms from the reference of a noun, and to do so it is defined as a function applying on the reference of the singular. As noted, this cannot apply to mass plurals, because either there is no singular at all or the singular exists but does not denote a set of atomic entities (in this sense *rains* is not the semantic plural of *rain*).

Note that (18) is not so much the semantics of *plurality*, as that of *pluralization*. But mass plurals appear to have the semantic properties of plurality without being built by a pluralization operation. In intuitive terms, the idea is to replace for them the plural-forming operation with a predicate “is a plurality”, and then conjoin this to the lexical predicate, without reference to singular atoms:

$$(19) [[ \text{clothes} ]] = \text{all } X \text{ such that } X \text{ is clothes and } X \text{ is a plurality}$$

In other words, plurality is part of the descriptive content of the lexical item. This brings out the intuition that we are dealing with *lexical plurals*, in which plurality is either an integral part of the lexical entry (for *pluralia tantum*) or an integral part of a lexical entry’s interpretation, specifically encoding its character as mass. When thus lexicalized, plurality is not a product of inflection, although it is spelled out through inflectional morphology. For doublets like *funds*, the difference is schematically as follows:



- (20) a *funds* [count]: PL (fund)  
 b *funds* [mass]: (fund & PL)

The interpretation as *conjunction* of two predicates, one of which is plurality, calls for some clarification of both constituent parts.

The lexical predicate poses the following problem: *pluralia tantum* like *clothes* cannot use a singular form of the predicate, yet using a plural in the paraphrase seems circular (*X is plural and is clothes*). But this is, I think, a pseudo-problem, caused by the practical need to use a form of the noun in the paraphrase. In fact, the lexical predicate is an abstract notion, which is neither singular nor plural but rather provides the base to be combined with number affixes. Languages like English may give the impression that the singular form of a noun invariably coincides with the unanalyzable base, morphologically and semantically primitive, but this is far from true. In fact, even in English the transnumeral interpretation of bare stem can be observed in compounds like *scissor-blade* or *trouser-leg*, or in the puzzling “singular” of the construction *%many a scissor, many a trouser* (which some, but not all speakers accept). So, the interpretation of mass plurals involves the lexical predicate as distinct from the singular or plural form, and this last notion is independently justified whether or not we can spell it out.

The definition of plurality as a predicate is instead a real issue. A definition of plurality as ranging over non-singleton sets, like (18), cannot apply to mass plurals, because they do not define singleton sets; for the same reason we cannot define as plural those entities that have more than one part, because that would presuppose that parts are countable. Consider now a predicate defining the property of having distinct parts, where  $a < x$  means that  $a$  is a part of  $x$  (cf. Simons 1987, 151, for a definition in a very different theoretical setting, but still referring to parts as individuals):

$$(21) [[ \text{plural} ]] = \lambda x \exists a \exists b [ a < x \wedge b < x \wedge a \neq b ]$$

The problem is that anything which is not an indivisible atom satisfies (21), singular or plural, mass or count. Notice that we should not restrict (21) to entities that are not integrated wholes, as in Moltmann’s (1997, 66) concept of entities with an accessible part structure, because some plurals like *scissors* or Russian *sani* ‘sledge’ refer to integrated wholes. Moreover, two

parts may be distinct if one is part of the other; then, a cat would be a plurality in so far as it is distinct from her tail; but this is clearly not the sense of plurality we are trying to capture. Finally, identity statements like  $a \neq b$  raise major problems if  $a$  and  $b$  are not discrete individuals with whole-properties; see Griffin (1977) for a thorough discussion of the view that  $a = b$  must be construed as *a is the same x as b*, where  $x$  is a sortal term—that is, a countable expression, as opposed to a mass term. It seems that (21) should be at least amended as in (22), where the distinctness requirement is replaced by the condition that neither of  $a$  and  $b$  is a part of the other (imposing that  $a$  and  $b$  have no parts in common is probably too strong):

$$(22) [[ \text{plural} ]] = \lambda x \exists a \exists b [ a < x \wedge b < x \wedge \neg(a < b \vee b < a) ]$$

Even so, neither (21) nor (22) can be the characteristic property of mass plurals, because either  $a$  and  $b$  are individuals, and then  $x$  is indistinguishable from a count plural, or they are not individuals, and then  $x$  is indistinguishable from a mass singular referring to a homogeneous substance.

Luckily, there is no need to encode the interpretation as manifold complex in a special predicate, different from both mass and discrete plurality. Recall that mass plurals denote complex entities whose parts span the whole range from individual wholes (*cattle*) to subquantities of a substance (*waters*), even including “parts” that are not defined at all (*depths*). Only a predicate like (22), which does not specify whether  $a$  and  $b$  are individuals (in the sense of integrated wholes) can subsume all these notions of parts, including the radically underspecified one illustrated by *depths*. The fact that this characterization also applies to count plurals and singular mass terms only goes to show that, as far as ontology is concerned, mass plurals may well have the denotation of count plurals or singular mass terms—and this is empirically the correct result, as I have shown in some detail. The conjoint “and  $X$  is a plurality” in (19) might as well read “and  $X$  is manifold”. The essential point is that this characterization is provided by a grammatical formative, namely plural number. This distinguishes mass plurals from nouns like *forest* or indeed *mass*, where the articulation of the denotation has no relation with grammatical number.<sup>3</sup>

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<sup>3</sup> This is the fundamental difference with respect to Chierchia’s (1998) approach, whose analysis of mass terms as inherent plurals in many ways underlies my proposal.

What, then, of the claim that plurality on mass plurals is not semantically irrelevant, but reflects a specific conceptualization? If the above reasoning is correct, and there is no special plurality predicate for mass plurals, there remains but one possible source for their distinctive interpretation: the manner of semantic composition. As I have argued above, plurality in mass nouns is built in the interpretation of the lexical predicate, either inherently to the stem itself (*pluralia tantum*) or as a property of a specific reading (as in *funds*). For this reason, plurality cannot be interpreted as a function taking the reference of the lexical predicate as domain—it is itself part of the lexical predicate. So, *funds* in its mass reading can be paraphrased as ‘manifold funding entity’ (where *entity* carries no commitment as to whole-properties). The plural inflection reflects a semantic property of the lexical predicate, and this distinguishes mass plurals both from regular plurals of count nouns and from mass nouns that do not linguistically encode the articulation of their referents. The characteristic interpretation of mass plurals ultimately results from the fact that plurality is part of the lexical predicate.

#### 4. CONCLUSION

The main concern of this paper has been empirical: to show that plural nouns cannot always be interpreted on the basis of the singular, that mass plurals exist and are well attested, and that morphosyntactic plurality on them has semantic significance. Specifically, they all have a reference domain articulated in parts conceptualized as non-wholes, but in such a way that the characterization of this domain as manifold does not proceed from a previous characterization of its single parts. In fact, some mass plurals (like *depths*) simply encode no information about the parts making up their reference; all they express is that the reference is manifold, and is characterized by the lexical predicate.

I have proposed that this intuitive characterization is reflected in the semantic composition of mass plurals: while *books* is schematically interpreted as [PL (book)], a mass plural like *depths* is [deep & PL]. This approach solves, in my view, the compositionality problem raised by nouns that are plural without being the plural of anything in particular. It does so by relating the interpretive properties of mass plurals to their status as lexical plurals, for which plurality is part of the noun’s descriptive content. Whether or not this approach is on the right track, it has the merit of highlighting the theoretical interest of mass plurals.

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