

On the Grammar of Number and Mass Terms in Greek*

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This paper examines the status of mass terms in Greek, focusing specifically on the fact that they seem to pluralise quite freely, unlike what happens in most languages. I examine the distribution of pluralised mass nouns and suggest an account that is based on the interaction of number *qua* syntactic head and the lexical specifications of mass nouns, which, following Harbour (2007), I characterise as [+ augmented]. It is also suggested that the [+ augmented] feature on mass nouns carries a quantity implicature.

1. Introduction

The main goal of this paper is to explain the systematic occurrence of plural inflection on mass nouns in Greek. (1) is a typical example of the cases that I will be concerned with:

- (1) Epesan nera sto kefali mu
fell-3rd-pl water-pl-neut-nom on-the head-neut-sg my
'Water fell on my head.'

This situation is exceptional in many ways. As is well known, the lack of plural inflection on mass nouns is a very robust crosslinguistic generalisation. So robust it is indeed that almost no theory of mass terms exists that lacks an explicitly stated mechanism to prohibit plural inflection on mass terms (I go through some of these theories in a later section), making it thus difficult to pinpoint, within any given theory, what the difference may be between languages that don't mark plural on mass nouns and the (very) few that do.

There are essentially two questions that arise with respect to this kind of data. First, how is plural marking allowed on mass nouns? And second, what kind of meaning does the plural *add on a mass noun*? Now, these are very legitimate questions but when we step back, one might, equally legitimately, counter that given the fact that mass nouns share crucial properties with count plurals, the question is rather different, i.e., why don't we really find this state of affairs more often—and by extension, what is it that blocks plural marking on mass nouns in other languages, say English, which would make Greek the expected case and English the exceptional one. As for the second question, the answer depends more

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on the particular view one espouses concerning the relationship between plurality and mass denotations. In this paper, I will basically try to answer these questions for Greek.

2. The Core Data

As mentioned in the introduction, the core data consist of pluralised mass terms. This section has two aims. First to present a range of examples covering the distribution of pluralised mass nouns, and second to examine the status of the count–mass distinction in Greek. Before we get into Greek proper, let me start with some basic facts about pluralised mass nouns in general.

It is well known that mass nouns accept plural marking in three well-delimited cases, i.e. when their denotation is coerced to that of:

- (2) a. Units of measurement/standard servings
- b. Type/kind
- c. Certain idiomatic expressions

So taking a typical mass term like *water*, the following are perfectly acceptable in English:

- (3) We ordered three waters an hour ago (i.e., three glasses or bottles).
- (4) Our restaurant serves only three waters (tap water, still mineral water, and sparkling mineral water).
- (5) Matilda's waters broke.

There are also cases that don't fall squarely within any of the above categories, as in (6), but which can be made to look like cases of a "units of measurement" reading under a suitable generalisation of the latter.

- (6) the Greek territorial waters

I do not know why the last kind of example occurs and I will anyway leave it out of the discussion in this paper. There is a degree of idiosyncrasy in the use of the plural with mass terms in general and the reasons are not well understood. If there is really something to understand, that is. So aside from the *Greek territorial waters*, we also talk of the *clear, cold waters of the North Atlantic*, *the burning sands of the Sahara*, etc.

The same kind of pluralised mass noun also occurs in Greek, as the following examples show:

- (7) Fere tria nera
 bring three waters
 'Bring three waters.'
- (8) Ti galata ehete?
 what milks have-2nd-pl

‘What (kinds of) milk do you have?’

- (9) Espasan ta nera tis Marias
broke the waters the-fem-gen Maria
‘Maria’s waters broke.’

This is expected. But alongside these cases we also find, more problematically, cases like the following (as already mentioned in the introduction):

- (10) Trehoun nera apo to tavani
drip-3rd-pl water-pl-neut-nom from the ceiling-neut-sg
‘Water is dripping from the ceiling.’

It is clear that in (10) there is no reference to units of measurement (it is not the case that bottles of water have to fall from the ceiling for (10) to be true) or types (again it is not required that there be one crack in the ceiling from which sparkling water is dripping and another from which we get tap water), and, finally, there is no such idiomatic expression that I know of. Further examples of this type are easy to construct; consider the following:

- (11) To patoma itan gemato nera
The floor was full waters
‘The floor was full of water.’
- (12) Nera ke ladia sto dromo na fovase
waters and oils on-the road SM be-afraid
‘Be afraid of water and oil on the road.’
- (13) Me tosa nera ke xomata pos na mi gemisi to spiti
with so-many-pl water-pl and earth-pl how SM not fill-3rd the house
laspes?
mud-pl
‘With so much water and earth how do you expect not to fill the house with mud?’

Clearly again in the examples (11)–(13) there is no reference to standard units or types of water, oil, mud, earth (dirt), and sand, and they are not idiomatic expressions either. The meaning of *water*, *mud*, *sand*, *oil*, *earth* is that of the mass noun. The generality of this pluralisation process is a matter of variation nevertheless. Some speakers (like myself) are slightly more conservative. Thus, I find the plural version of (14) unacceptable, or very difficult to accept, unless it occurs in a list/enumeration environment like in (15). I have, however, found several speakers who accept the plural version very easily.

- (14) Kopike/an to/*ta nero/*nera
was-cut-off the water/waters
‘The water was cut off.’

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- (15) Ase, ti na su po, kopikan nera, revmata,
leave-it, what SM you-cl say-1st, were-cut-off waters electricities,
tilefona ... tipota den ihame
telephones ... nothing Neg had-1st-pl
'It was terrible, what can I say, water, electricity, telephone were all cut
off ... we had nothing.'

Note furthermore that the pluralisation process does not only affect prototypical mass nouns but also "massified" count nouns as in (16):

- (16) Den mu aresi i salata me (to/ta) milo/mila
Neg me-cl like the salad with (the-sg/pl) apple/apples
'I don't like salad with apple.'

On the other hand, there are cases where mass nouns can't pluralise, and this is not a matter of variation. One such environment is generic statements like (17) and its ungrammatical plural counterpart (18):

- (17) To nero vrazi stus 100 vathmous
the water/s boils at 100 degrees
'Water boils at 100 degrees centigrade.'
- (18) *Ta nera vrazun stus 100 vathmous
the waters boil at 100 degrees
'Water boils at 100 degrees centigrade.'

Note that count definite plurals are generally fine in generic contexts:

- (19) Ta liodaria zun sta kato petralona
the-neut-sing lions live at K. P.
'Lions live in Kato Petralona.'

Apart from generic contexts, it is also the case that pluralisation is more felicitous in some contexts and with some nouns more than with others. So for example, a builder who is mixing mortar (referred to in Greek as mud) will never point to the mixing container and utter (20):

- (20) *I laspes eginan
the muds are-done
'The mortar is ready.'

Some of these restrictions can be considered idiosyncratic, though the restriction to episodic contexts requires an explanation. Before we think of possible analyses, it is necessary to examine whether Greek is a language that does display the count-mass distinction. I assume, together with Chierchia (1998a; 1998b) and Borer (2005), that the count-mass distinction is a grammatical one and talking of a language not displaying it means that there would be specific grammatical properties/constructions that the language does not show. There are several ways in

which a language can fail to show this distinction. One example that comes to mind is the case of Chinese-/Japanese-/Korean-type languages whose nouns, according to a fairly general consensus, have all basic mass denotations and turning them into count nouns requires various structural alterations. There is no language that I know of that has been claimed to have (lexically) only count nouns, such that creating mass nouns requires special structure. As far as I can tell there is no good, linguistic explanation for this state of affairs. Chierchia (1998a; 1998b) has suggested that nouns referring to liquids can never be (all) count and thus, unless we find a language without a word for *water* or any other liquid substance, there are no count-only languages. This is good as far as it goes but one would indeed have preferred a more structural explanation. So far Greek fails to present one of the basic properties of the count–mass distinction (unavailability of plural morphology on mass nouns). If it doesn't display the other characteristics then maybe we have found the elusive count-only language. As I show straight away this is not the case.

2.1. The count–mass distinction in Greek

In this subsection, we test the mass status of the nominals in question with respect to the possibility of occurring with numerals and to the necessity of classifier/measure phrase for counting. In the next subsection, we test their mass status with respect to their occurrence with determiners such as *much*, *little* and non-occurrence with *many*, *a*, etc.

2.1.1. Compatibility with numerals

Let's start with the inability of mass nouns to combine with numerals.

- (21) *Dio nera trehun apo to tavani
two waters run from the ceiling
'Two waters drip from the ceiling.'

We see here that Greek plural-marked mass nouns behave with respect to numerals in the same way as their singular English counterparts.

2.1.2. Classifiers/measure phrases

This test refers to the fact that in order to count mass, a classifier or a measure phrase is required as in (22):

- (22) *two water vs. two **bottles of** water

Of course it is possible to argue that this property is a corollary of the impossibility of using numerals with mass nouns (see above). In the case of Greek plural mass nouns we observe exactly the same patterns:

- (23) *dio nera vs. dio **boukalia** nero
two waters two bottles water
'two bottles of water'

- (24) *exi laspes vs. exi **kuvades** laspi
six muds six buckets mud
'six buckets of mud'

Two further points are worth mentioning here. First, despite the liberal plural marking on mass nouns observed earlier, when a measure phrase/classifier is present the mass noun is in the singular:

- (25) *dio boukalia nera
two bottles waters
'two bottles of water'

It is, however, possible in restricted circumstances to pluralise the mass noun even in those cases. Consider the following:

- (26) Exi kuvades laspes evgala apo to spiti meta to htisimo
Six buckets muds removed-1st from the house after the building
'I removed six bucketfuls of mud after the building work had finished.'
- (27) Tris dexamenes nera epesan apo to tavani
Three tanks waters fell from the ceiling
'Three tankfuls of water came through the ceiling.'

What is different about these cases? The key difference between pluralised mass nouns and quantised mass nouns is that a singular mass noun can be quantised and a plural one (in general) cannot. In contexts where classifiers/measure phrases are involved, there is a switch in the denotation of singular mass nouns to the denotation of standard quantities of the stuff. This can be easily done by defining a measure μ over the Boolean structure (see Higginbotham 1995 for details on one way to do it using measure theory). On the other hand, any quantifier/measure phrase/classifier attached to a plural mass noun (as in (26) and (27)) is not *counting* units but rather *specifying amounts*,¹ and amounts need not be standardised in the sense that nobody *standardly* counts mortar quantities by the bucket or water quantity by the tank. In specific circumstances these may be the most salient measure of the amount. This is I believe why plural mass nouns can be used in these cases.

The second point concerns the fact that it is more difficult to pluralise a mass noun which is usually found in *standard servings*, like *beer*. Witness the fact that it is a lot more difficult to construct examples where the word *bires* 'beers' would refer to anything other than a number of bottles/cans of beer. It is not impossible though:

- (28) hithikan pola pota sto parti, to patoma kolage apo tis bires
Were-spilled many drinks at-the party the floor stuck from the beers
'A lot of drinks were spilled at the party; the floor was sticky from the beer.'

¹Hence the translation in terms of the 'X-ful' morphology in (26), (27).

Finally let's turn to the last test, i.e., occurrence with determiners like *much* and *many*.

2.2. *Much, many, and other determiners*

The difficulty in applying this test resides in the choice of determiners and in finding the appropriate determiner corresponding to *much/little* in Greek. I will assume the following non-exhaustive typology of determiners:²

(29)	Determiner type	English	Greek
	Mass	<i>much, little</i>	<i>poli, ligo</i>
	Count		
	Singular	<i>every, a, each</i>	<i>kathe, enas</i>
	Plural	<i>many, several, few, both</i>	<i>meriki</i>
	Mass and plural	<i>all, a lot, plenty, most</i>	<i>poli, oli, perisoteri</i>
	Unrestricted	<i>the, some, any, no</i>	<i>o/i/to, kapios, kanenas, arketos, kabosos, bolikos ...</i>

Determiners in Greek agree in Case, number, and gender with the noun.

The same determiners *poli/ligo* appear with both mass and count nouns, as in (30) and (31). Also, however, and more importantly for us, the determiners classed as “mass and plural” can occur with a plural mass noun in its mass interpretation, as in (32) and (33).

- (30) *Ipia poli/ligo nero*
 drank-I much/a-little water
 ‘I drank much (a lot of)/little water.’
- (31) *Poli/ligi fitites perasan tis exetasis*
 many/few students passed the exams
 ‘Many/few students passed the exams.’
- (32) *Den eho xanadi perissotera nera sto patoma*
 Neg have seen more waters on-the floor
 ‘I have never seen more water on the floor.’
- (33) *Sfougarise prota ola ta nera ke meta vlepoume*
 mop first all the waters and after see
 ‘Mop first all the water and then we will see.’

At the same time, clearly count determiners do not appear with mass nouns in any context:

- (34) **Kathe nero ine ahromo*
 Every water is colorless
 ‘Every water is colorless.’

²See also Borer (2001).

Thus, although not entirely or strikingly conclusive due to extraneous factors, the *much/many* test is at least suggestive of the fact that we are faced here with an occurrence of a real mass noun. Another point that needs to be made here is that, as can be seen from examples such as (30), (32), (33) and also (35), plural mass nouns are not bare plurals, simply because they appear with both the definite and other determiners:

- (35) Mazepse ta rizia apo to trapezi prota ke meta skouprise to
collect the rices from the table first and after wipe it
'Collect first the (grains of) rice from the table and then wipe it.'

To summarise so far, then, it seems that Greek has *normal* mass nouns and the count–mass distinction save for the pluralisation facts.

2.3. S-mass/O-mass nouns

Consider finally the distinction between S(ubstance)-mass and O(bject)-mass nouns.³ S-mass nouns are those that we have been looking at so far: things like *water*, *mud*, and *sand* (distinctions of granularity aside). On the other hand O-mass nouns are those which grammatically behave like S-mass nouns but whose denotation contains clearly identifiable *atomic* parts, a paradigmatic example of which in English is *furniture*.⁴ Although the distinction seems to occur in many languages (cf. French *meubles* vs. *mobilier*) Greek does not seem to have any of these as far as I can ascertain. All nouns of this type can occur in the singular or in the plural as in (36):⁵

- (36) a. epiplo vs. epipla 'furniture/s'
b. maheropiruno vs. maheropiruna 'cutlery/ies' (literally 'fork-knife')
c. asimiko vs. asimika 'silver(ware)/s'

Descriptively speaking this is more or less the situation in Greek. In order to measure the challenge and appreciate the relevance of the different analytical possibilities, in the next section I will present as briefly as possible the state of the debate regarding the status of mass terms and the count–mass distinction. I will not seek completeness here. I will only present a few stands on the distinction that are in fact representative of larger families of approach.

3. Mass Terms and the Count–Mass Distinction

Fundamentally, the debate revolves around two main axes. First there is the question of the domain (and how many of them there are). In a nutshell, do the differences between count and mass terms follow from the fact that they take their

³The terminology 'S-/O-mass noun' comes from Barner and Snedeker (2005).

⁴These are the mass nouns that Chierchia in later work calls *fake* mass nouns.

⁵The qualification "as far as I can ascertain" may turn out to be quite important. All the nouns of this type I could think of are not behaving like mass nouns. One possible exception is *ruhismos* 'clothing' though a very cursory Google search does come up with two cases of this noun in the plural. Possible exceptions like this notwithstanding, I believe that the claim that Greek does not have any O-mass terms is by and large true.

denotations in the count and mass domains respectively? Or there is another explanation such that we can keep to an ontologically simpler statement using one domain of quantification for all? The second issue concerns the primacy (or not) of one type of denotation over the other and the (mainly syntactic) ways to derive it. Let's start with the question of the domains.

3.1. The domain question

Link (1983) is, in many ways, the origin of a large amount of work on mass terms and plurals in formal semantics. In a nutshell, Link's proposal is that there are two quite separate (yet communicating) domains of quantification, both with a lattice-theoretic structure. The fundamental difference between them is that the domain in which count predicates take their denotations is a join *atomic* semi-lattice, while the one for mass terms is a *non-atomic* semi-lattice. For obvious reasons, this model and the ones it has spawned are sometimes called dual-domain models. More formally, such a dual-domain model might look like this:

- (37) a. $\langle \mathcal{D}, \mathcal{M}, p, g \rangle$ such that
 b. $\mathcal{D} = \langle D, \bigcup_C, \leq_C \rangle$ (an atomic join semi-lattice)
 (i) $\forall X, X \subseteq D \rightarrow \bigcup X \in D$
 (ii) $x \bigcup y = \bigcup x, y$
 (iii) $(x) = \{y : y \leq x\}$ (ideal generated by x)
 (iv) $At(X) = \{x \in X : \neg \exists y [y \in X \wedge y \leq x]\}$
 (v) $At(X) \neq \emptyset$ (atomicity)
 c. $\mathcal{M} = \langle M, \bigcup_M, \leq_M \rangle$ (a non-atomic join semi-lattice)
 d. $g: D \rightarrow M$ (the universal grinder)
 e. $p: M \rightarrow D$ (the universal packager)

Here the two domains are \mathcal{D}, \mathcal{M} for count and mass terms. On the other hand, Chierchia (1998a; 1998b)⁶ has proposed that there is no need for two domains and a single one will do just as well. One recent instantiation of this view is due to Chierchia (1998a; 1998b; 2003). The story goes like this. The basic, and rather uncontroversial, assumption is that singular NPs denote *sets of individuals*. To get the denotation of a plural NP, we will have to use a set-forming operator and get all the possible sets containing at least 2 individuals from the extension of the singular. Therefore, plurals denote sets of sets of individuals (*pluralities*).

Now, the domain of quantification will contain the denotata of both singulars and plurals and therefore it will look like (38), where the bottom row represents atomic individuals and the two rows above pluralities:

$$(38) \quad \begin{bmatrix} & \{a, b, c\} & \\ \{a, b\} & \{a, c\} & \{c, b\} \\ a & b & c \end{bmatrix}$$

Again here we have a *join complete atomic semi-lattice*. Given this we can represent the denotation of a singular as:

⁶See also Gillon (1987; 1992) and references therein for antecedents. See Ojeda (2005) for a slightly different view.

$$(39) \quad \{ a \quad b \quad c \}$$

and that of a plural as:

$$(40) \quad \left[\begin{array}{ccc} & \{a, b, c\} & \\ \{a, b\} & \{a, c\} & \{a, b\} \end{array} \right]$$

Notice that what is missing from the denotation of the singular is the pluralities and what is missing from the plural is the singularities or atoms, as we would expect.

The operation that you need in order to get the plural from the singular is straightforward (from Chierchia 1998a):

$$(41) \quad PL(F) = \lambda x[\neg F(x) \wedge \forall y[y \leq x \wedge At(y) \rightarrow F(y)]]$$

Mass nouns, on the other hand, have a denotation which is differently structured. Namely, whereas the denotation of a singular is a subset of the set of atoms and the denotation of a plural a subset of the set of pluralities, the denotation of a mass noun is a sub-lattice of the domain, i.e., a construct with the same structure as the domain itself. In other words, something that contains both atoms and pluralities.

It is in this sense that a mass noun is *lexically* or *inherently* plural, and as such it can no more be pluralised than say *books* or *boys* can be pluralised. Let us finally turn to the count–mass distinction.

3.2. The count–mass distinction

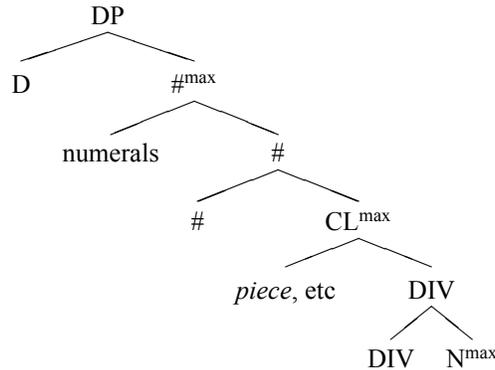
In the previous section we saw two different views of the semantics of mass terms. One important question that has been recently discussed in detail is the place and the effects of the distinction between count and mass terms in the grammar of individual languages, and the analysis of the observed variation. Again, glossing over a lot of detail, the important issue here is whether there are languages with only mass nouns, languages with only count nouns, and finally whether one of the two, mass or count, is in some sense more fundamental and the other can be derived from it. Chierchia’s answer to this question is based on his *Nominal Mapping Parameter*, which regulates the distribution of bare arguments in particular languages.

3.2.1. Borer (2005)

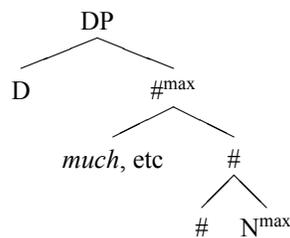
In her wide-ranging study, Borer (2005) proposes that the basic denotation of all nouns in all languages is mass. In the absence of any *dividing structure*, nouns will receive a mass interpretation. By “dividing structure,” Borer understands both classifiers, like those found in languages with generalised classifier systems such as Chinese, Japanese, Korean and so on, but also, and more controversially, plural inflection. As evidence for this, she observes that in general, classifiers and plural inflection are in complementary distribution—which she takes to be the hallmark of identity. Her idea is that plural inflection is divisional in nature and the common property that bare mass nouns have with bare plurals is that the nature of the quantities remains under- or un-determined. In (much-) simplified form, the nominal

structures that Borer (2005) proposes look like this:

(42) Count nouns:



(43) Mass nouns:



Obviously then, what gives rise to the (default) mass interpretation is the absence of *classifier* structure.

Looking now back to the data that were described in section 2, we can easily see that pluralised mass nouns are problematic for any theory (that we have seen) in the sense that there is no apparent straightforward way to derive the facts. That the items in question are mass nouns cannot, however, be seriously doubted. In the next section I will propose an analysis in which I will, to a certain extent, question the second, underlying assumption, namely that what we are looking at is a true plural. The idea here is that there is no point tinkering with the definition/status of mass nouns. The source of the anomaly may be located in the analysis of number.

4. Analysis

Most work on the semantics of plurals assumes simply that semantic plurality is the result of the application of a pluralisation operator or something of similar nature, say something like (41). This operator is contributed by the plural morpheme and as a result, the assumption is that the plural is a derivative of the singular.⁷ Con-

⁷There are some obvious exceptions here like *pluralia tantum*, etc. I will leave those aside.

cerning, more specifically, the plurality of mass terms under Chierchia's proposal, it is somehow located in the way their denotation is built, without any explicit featural marking to that effect. The lack of pluralisation falls out of the fact that given the way the denotation of mass nouns is structured, they are just the wrong thing to try and pluralise.⁸ Recent work by Heycock and Zamparelli (2005), Harbour (2007), and Tsoulas (2005), among others, has suggested that some kind of featural specification is indeed needed. Heycock and Zamparelli (2005) and Harbour (2007) both suggest that in general a single feature, say [\pm plural], will not do in order to represent number. Harbour (2007) proposes the following three features: [\pm singular], [\pm augmented], [\pm group], which he defines as follows:

- (44) a. [$+$ singular] = $\text{atom}(x)$
 b. [$+$ augmented] = $\lambda P \exists y [P(x) \wedge P(y) \wedge y \sqsubset x]$
 c. [$+$ group] = $\lambda P_{[+ \text{augmented}]} \exists Q [P(x) \wedge P \neq Q \wedge Q - a(x)]$

On the other hand, Heycock and Zamparelli (2005) propose that not only two features are needed but also two functional projections, NumP and PluralP. The features for which the heads Plural⁰ and Num⁰ may be specified are [\pm plural] and [\pm LATT(ice)]. In a nutshell (and simplifying a great deal) the former feature is responsible for morphosyntactic plurality and the latter for semantic plurality. Concerning mass nouns, in Harbour's system, they are specified [$+$ augmented, $-$ singular, $+$ group], whereas in Heycock and Zamparelli's system mass nouns are basically characterised by the fact that they denote a *singleton property at every situation*. Their behaviour with respect to number is regulated via the specifications of the Num⁰ and Pl⁰ heads. Harbour's system is rather silent on the reasons why mass nouns do not pluralise. Heycock and Zamparelli on the other hand state the following principle:

- (45) *No vacuous plurality*: Morphological plurality is a marked choice and as such cannot be used vacuously.

On the surface, Greek appears to be doing exactly that, unfortunately.

Now, with this in mind, I will first try to answer the first question raised in the introduction, namely, how is plural marking allowed on mass nouns. The account will proceed along the following lines. Let's start with the status of mass nouns. I will adopt the spirit of Chierchia's *inherent plurality* approach but I will propose that instead of characterising mass nouns in terms of their denotation alone, they also carry formal marking. I want to suggest that the most appropriate such marking is [$+$ augmented], in other words they have subparts and cumulativeness obtains. Note here that by simply specifying [$+$ augmented] we remain neutral as to the atomicity of the lattice structure, i.e., we can go along with Chierchia's representation in section 3.1. Turning now to number, I make the (not too controversial) assumption that the locus of number specifications is a functional head NumP or φ P. Furthermore I will propose that Greek does not instantiate a [$+$ plural] feature in Num⁰/ φ ⁰ but rather that the relevant distinction is [\pm singular]. A specification of [$-$ singular] will mean effectively (what we call) plural for count nouns and, essentially, nothing for mass nouns.

⁸Chierchia does not explicitly *reject* the possibility of featural marking, though he doesn't propose one either.

Essentially, the task here is to come up with appropriate interpretations for the various combinations of features. I will also assume here that lexical roots are number-neutral in the general case. Exactly what it means to be number-neutral is something that requires further clarification. Does it lead us to a Borer-style analysis where all nouns have mass denotations and number inflection is divisional? Perhaps. Let's assume for the purposes of this discussion that although information about the *lattice* so to speak can be given lexically, this is not the case for number, which must come from the number head. I will also assume, as proposed above, following Harbour (2007), that the *lattice*-related information will be specified in terms of the [\pm augmented] feature.

Putting these ingredients together, with count nouns what happens is obvious: [- singular] is morphologically interpreted as what we call the plural, and in the semantics, whatever one chooses to use as the representation for the pluralisation operation, this is what will happen. With mass nouns now, which are formally marked as [+ augmented], we will have two possibilities. First:

(46) Num is [- singular]

Rather than taking this as an immediate conflict (pluralising something that is already plural), it is more helpful to think of the structure that the interface will have to interpret. Essentially, the interfaces will be presented with a DP with the features [+ augmented, - singular]. Greek does not have a morphophonological spell-out for [+ augmented] so this is a feature that, in the relevant sense, is ignored at PF. [- singular] on the other hand has a perfectly good PF interpretation, the plural morphology. Semantically, this is problematic only insofar as we assume that Num *applies* to NP. If we do not make this assumption and instead assume some kind of modification, then all that is relevant is the interpretation of the feature bundle at LF and [- singular, + augmented] has a clear mass interpretation with plural morphology. As a result, I propose that the plural marking of Greek is fundamentally different from that of English in the sense that in Greek the plural morpheme does not represent a plural operator, say like PL, but a modifier. Combining the plural with the noun will give us a structure similar to that of intersective adjectives. Thus:

(47) Waters = water(x) \wedge plural(x) (or nonsingular)

I will return to the effect of this in a minute.

Therefore we predict that plural morphology will appear more or less freely on mass nouns. At the same time we can also simply point out that there is no a priori reason to think that there is any conflict whatsoever, since [- singular] and [+ augmented] do not conflict really. In Harbour's system they very happily coexist. At the same time one does not want to go too far with this. There must be a way to constrain these featural combinations given that plural morphology does *not* occur freely on mass terms crosslinguistically. The idea here is that if we assume a universal feature system we predict mass nouns to always be marked as [+ augmented] in the lexicon. It follows that any observed variation will have to involve the specification of NumP. Notice here that the system sketched here is not far from Heycock and Zamparelli's system, except that where they use two syntactic heads, we have a combination of lexical specification and the features of

NumP. Let's leave the details for a little later too and turn to our next case, which is (48):

(48) Num is [+ singular]

This case at first seems simple; it is the standard case where a mass noun occurs in the singular. But when we think about the kind of interpretation that a [+ singular, + augmented] element should get, a problem arises. Recall that plurals are also [+ augmented]. Therefore, here we have the case where a true conflict appears; to put it in different terms, what will be the effect of [+ singular] number on a (lexically) *plural* N? In fact this is not a very common situation. Unlike what one might think, the reason that mass nouns turn up in the singular in English (under Chierchia's view, for example, but also under several other approaches) is not that there is somewhere an explicit *singular* specification, but rather they do so as some kind of default or last resort, given that the plural would lead to ungrammaticality. It is also based on the primacy, so to speak, of the singular. So the case at hand is rather uncommon. Fortunately, however, not *too* uncommon. A case in point here is Welsh. Welsh has a singular/plural distinction but for a certain class of nouns the singular is derived from the plural by suffixation. It is sometimes suggested that this is a system that differentiates collections and units; again it is uncommon for the unit to be formed from the collection. Some examples:

- (49) a. moch 'pigs' → mochyn 'pig'
b. gwellt 'grass' → gwelltyn 'blade of grass'

The morpheme *-yn* seems to form singulars from plurals and map a mass noun to its individual part if there is a natural individual part (a blade of grass) but not to a standard unit (nobody measures grass in blades). With the Welsh facts in mind we can now reformulate our question: what would be the effect of [+ singular] on a [+ augmented] noun which has no natural atomic parts? It is, I suggest, natural to conceive of [+ singular] number as a type-shifting device, mapping the lexically plural mass property to its, so to speak, singular counterpart. Now that would be a *kind*, and kinds are singular. Recall at this point that under Chierchia's account, the reason why all nouns in languages like Chinese turn out to have mass denotations is that they are really referring to kinds and when they need to be mapped onto properties—given that kinds do not differentiate between singularities and pluralities in terms of their instantiation—they are mapped onto mass properties. If the proposal I sketch here is on the right track then it lends support to Chierchia's view in the sense that the mapping happens also in the other direction. The mapping between properties and kinds is straightforward:

- (50) a. UP: $\cup \langle \langle s, \langle e, t \rangle \rangle, e \rangle$
b. DOWN: $\cap \langle e, \langle s, \langle e, t \rangle \rangle$

Therefore, the proposal here is that the singular marking appearing on mass nouns results in type shifting. There are consequences of this to which I will return.

4.1. The meaning of the plural on mass nouns

The previous section dealt with the effect of number and number specifications on mass nouns and sketched an account of the appearance of plural inflection on mass nouns. But a question still remains. Namely, plural morphology is not vacuous. It contributes meaning. What kind of meaning would it contribute in the cases at hand? I would like to suggest that the plural morphology here contributes a plurality/quantity implicature. If we look at the examples of section 2 again we notice that the meaning that is clearly being conveyed by the plural mass noun is—to put it crudely—“there is more of the stuff” than what would be expected under normal circumstances. Consider for instance the following dialogue:

- (51) A. Afise o Gianis anihto to lastiho ke gemise i avli nera.
'Giannis left the hose on and the yard was full of waters.'
B. Min ipervalis Fofu mu, de gemisame nera, na ligo nero/#nera etrekse.
'Don't exaggerate, Fofu, it wasn't full of waters, just a little water/
#waters dripped (out of the hose).'

What speaker B denies is the quantity of water involved. Using the plural in this case is quite infelicitous. The idea here is directly linked to the analysis in terms of modification that was given above. In effect using a plural mass noun does amount to using a double plural. Speakers of languages where this is allowed would not do that for no reason. The proposal thus is that from this *reduplication*, so to speak, a quantity implicature arises.

5. Some Concluding Remarks

In this paper I attempted to sketch in fairly informal terms an account of certain surprising facts regarding the pluralisation of mass terms in Greek. I argued that the data can be understood in terms of the interplay between a subset of number features (realised on a syntactic number head and instantiated in Greek as [\pm singular]) and the notion of number neutrality that characterises lexical roots. This entails a separation between number proper and information regarding the constitution of the denotation of nominal elements (this ought to extend to non-nominal predicates too). I also argued that in certain cases at least [+singular] results in type shifting and thus it is perhaps only indirectly related to number *per se*—something which, if true, would explain also the absence of O-mass nouns from Greek. Chierchia, in recent work, argued that they only occur in languages that mark number. Many open questions remain and must be left for future research. We need, for instance, an explicit account of the way the quantity implicature arises. Also, the crosslinguistic implications for the present analysis must be drawn and examined carefully. Finally, there are implications for the nature of number itself. I have suggested that the singular in Greek is perhaps not exactly, or perhaps not uniquely, number but participates in type-shifting operations, and that pluralisation should be seen as a type of modification. Finally the distributional restriction to episodic contexts requires further analysis. I have no space to consider all these aspects of the proposal, but I hope to return to them soon.

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