

# *Jewelry*'s missing “jewel”: containment, doublets and gaps as probes into countability and the count-mass distinction

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## Abstract

Object mass nouns like *jewelry*, *kitchenware* or *furniture* are challenging for any theory of the count-mass distinction because they pattern with count nouns in two respects: (i) size adjective modification and (ii) countability, i.e. measurement along a cardinality scale. The traditional view (Chierchia 1998, 2010; Bale and Barner 2009) rests on the idea that these nouns are lexically specified or marked plural but enter the syntax into a mass frame thus preventing subsequent count properties such as numeral modification or overt plural marking. However, the roots that participate in the count class overextend to the object mass class giving rise to doublets in many cases. In fact, the object mass member of the doublet is built on top of the same base that the count noun is built on. I argue that (i) the representation of object mass nouns properly contains a countable base (i.e. an individuated categorized root) and (ii) the object mass piece (e.g. *-ery*, *-ment*, *-age*, *-ware* etc.) is in overlapping distribution with, and competes with, Number hosting [SG/PL] features. I show how the proposal not only accounts for all the properties of this class of nouns in English and Spanish including the existence of lexical gaps and eventive object mass nouns, but also both predicts and can handle cross-linguistic variation. At a more general level, this proposal illuminates our understanding of the grammatical encoding of the count-mass distinction, countability and the locus of cross-linguistic variation.

## 1 Introduction

Languages may manifest morpho-syntactic differences in the distribution of Noun Phrases (NPs). For example, the NP *jewel* can appear in the contexts in (1a) but the NP *blood* in (1b) cannot.

- (1) a. Johnny saw every light-red jewel, and Moira saw a dark red one.  
b. \* Johnny saw every light-red blood, and Moira saw a dark red one.

First NPs such as *jewel* can occur with universal determiner *every* and be the antecedent of the pronominal form *one*. Second, when someone utters (1a), we understand that they saw every individual jewel. On the contrary, NPs such as *blood* in (1b) cannot occur with *every* or be the antecedent of *one* (Bale and Gillon 2020). Besides, when they utter (1b), English speakers do not understand the expression to mean that they saw ‘every discrete unit of blood’ like ‘a drop’ or ‘a vial’. NPs such as those in (1a) are classified as ‘count’ NPs, whereas those in (1b) are classified as ‘mass’ NPs.

While the class of count nouns is largely uniform, i.e. every count NP has the same morpho-syntactic properties, there are differences within the class of mass. For example, NPs like *suds* and *dregs* are overtly

plural-marked but they lack a singular counterpart and cannot be modified by numerals or size adjectives (Ojeda 2005), as in (2). Additionally, NPs like *jewelry*, *furniture* or *kitchenware* have a mass syntactic distribution but can be modified by size adjectives, e.g. (3) (Chierchia 1998, 2010; Schwarzschild 2011; Deal 2017). The former are generally called ‘plural mass nouns’ and the latter are called ‘object’ or ‘fake’ mass.

- |   |   |
|---|---|
| (2) a. * This dregs<br>b. These dregs<br>c. * Large dregs<br>d. * two dregs | (3) a. This jewelry<br>b. * These jewelries<br>c. Large jewelry<br>d. * Two jewelries |
|---|---|

In terms of the semantic properties, what largely distinguishes between the two classes is the asymmetry in (4), as observed by Bale and Barner (2009). Plural count NPs like *jewel* can be counted, while unmarked and plural mass NPs like *blood* or *dregs* cannot.

- |   |  |
|---|--|
| (4) a. Johnny saw more jewels than Moira did.<br>b. Johnny saw more blood than Moira did.<br>c. Johnny saw more dregs than Moira did. | CARDINALITY, #VOLUME<br>#CARDINALITY, VOLUME<br>#CARDINALITY, VOLUME |
|---|--|

I will refer to the NPs that can be measured in terms of cardinality as ‘countable’. In contrast, ‘non-countable’ NPs are those that cannot be counted. While the countable/non-countable distinction overlaps to a large extent with the classes of count and mass NPs respectively, there is a well-known exception: object mass nouns are countable as (5) shows.

- |   |                      |
|---|----------------------|
| (5) Johnny saw more jewelry than Moira did. | CARDINALITY, #VOLUME |
|---|----------------------|

Based on these facts, object mass nouns have become a challenging class for theories of the count-mass distinction. In particular, any theory of the count-mass distinction has to account for the following generalizations about object mass nouns: a) their syntactic distribution is that of mass nouns; b) they resist number marking; c) unlike all other subclasses of mass nouns, they overlap with count nouns regarding size adjective modification; and the fact that they are countable.

The traditional view, going back to Chierchia (1998), and subsequent work by Chierchia (2010); Bale and Barner (2009); Cowper and Hall (2009, 2012, 2014); Rothstein (2010); Smith (2021), is based on the assumption that (i) object mass nouns are listed in the lexicon with the same underlying form that they surface with, e.g. (6a), and (ii) these forms are lexically plural, which ensures a count denotation, but enter the syntax in a mass frame as in (6b). This prevents subsequent count properties such as pluralization, numeral modification and compatibility with certain determiners. The label *mass* in (6b) is used purely pretheoretically.

- (6) a.  $\sqrt{\text{JEWELRY}}$  is mapped to the surface form *jewelry*  
        $\sqrt{\text{FURNITURE}}$  is mapped to the surface form *furniture*



However, the traditional view misses an important empirical generalization regarding the classes of roots found in object mass NPs: the roots that participate in object mass nouns are coextensive with the roots of the count class. A representative sample from English is in (7).

- |     |                        |                       |                        |                          |
|-----|------------------------|-----------------------|------------------------|--------------------------|
| (7) | a. jewel-s<br>jewel-ry | b. word-s<br>word-age | c. image-s<br>image-ry | d. table-s<br>table-ware |
|-----|------------------------|-----------------------|------------------------|--------------------------|

The examples in (7) illustrate that the same  $\sqrt{\text{ROOT}}$  is used for both the count noun expression and for the object mass counterpart. Besides, where the count and the object mass nouns differ is in the subsequent morphological marking on that nominalized root: count nouns are marked for number, exponed as *-s* if it is plural, whereas object mass nouns are ‘object mass’-marked (e.g. *-age*, *-ery*, *-ware*) where one would expect the number morpheme to surface. This morpho-syntactic complexity is not limited to English, but it is also observed in Dutch (De Belder 2013) and French and Hebrew (Cohen 2020).

Cross-linguistically, languages might differ. In fact, Chierchia (2010, 2021) reports that there are languages that have a count-mass distinction but lack an object mass subclass. Under the traditional view, these cross-linguistic differences are lexical: where languages differ is in the set of roots that are part of their inventory. While this might not be a fatal argument by itself for the traditional view, there are languages where such variation cannot be deemed lexical. For example, the counterpart of this class of nouns in Czech is not plural, but collective-marked and allows (complex) numeral modification. This is shown in (8) adapted from Grimm and Docekal (2021).

- |     |                           |              |
|-----|---------------------------|--------------|
| (8) | a. *dv-oje                | list-y       |
|     | two-COLL.CARD             | leaf-M.PL    |
|     | Int. ‘two sets of leaves’ |              |
|     | b. dv-oje                 | list-í       |
|     | two-COLL.CARD             | leaf-NT.COLL |
|     | ‘two sets of foliage’     |              |

I consider that these observations present strong challenges for the traditional view and that an alternative explanation is in order. In particular, we must explain why object mass nouns have a large degree of overlap with count nouns (e.g. in terms of their morpho-syntactic and their countability properties), but have a mass distribution otherwise. In addition, we must explain why in many languages, English being one of them, the nouns composing this subclass cannot be modified by numerals but in others such as Czech they can.

In this paper, I argue that object mass nouns are morpho-syntactically complex and fall under the umbrella of productive nominalization processes (Lieber 2004, 2016; De Belder 2013; Alexiadou 2015; Cohen 2020). More specifically, building on these insights, I will motivate the novel generalization in (9), on the basis of English and Spanish data.

#### (9) Countable Base Generalization

Object mass nouns are built on top of the same countable base (e.g. root+categorizer) as count nouns.

Based on the generalization in (9), I propose the hypothesis in (10). In a nutshell, like Bobaljik’s (2012, p.4) original formulation of containment, the central claim of this hypothesis is that (11a) is a possible representation of object mass nouns, but (11b) is not.

(10) The representation of object mass (and count nouns) properly contains a countable base.

- (11) a.  $[[\underbrace{[\sqrt{\text{ROOT}} \text{ COUNT}]}_{\text{jewel}} \underbrace{\text{OBJECT MASS}}_{\text{-ery}}]] \rightsquigarrow \text{'collection of jewel-related things'}$   
 b.  $*[[\underbrace{[\sqrt{\text{ROOT}}]}_{\text{jewel}} \underbrace{\text{OBJECT MASS}}_{\text{-ery}}]] \rightsquigarrow \text{'collection of jewel-related things'}$

What is more, if object mass nouns and count nouns share what I am referring to as the countable base, i.e. root + categorizer (e.g. *n*) making the root countable, but differ in the nature of the terminal that merges outside of this base, then we can extend the implication of the hypothesis in (10) to count nouns as well: only (12a) is the possible representation of count nouns.

- (12) a.  $[[\underbrace{[\sqrt{\text{ROOT}} \text{ COUNT}]}_{\text{jewel}} \underbrace{\text{Number}_{\text{SG/PL}}}_{\text{-}\emptyset\text{/}\text{-s}}]] \rightsquigarrow \text{'jewel(s)'}$   
 b.  $*[[\underbrace{[\sqrt{\text{ROOT}}]}_{\text{jewel}} \underbrace{\text{Number}_{\text{SG/PL}}}_{\text{-}\emptyset\text{/}\text{-s}}]] \rightsquigarrow \text{'jewel(s)'}$

Besides, looking at these schematic representations we can further hypothesize the following about the object mass and Number terminals: object mass marking and number-marking on count nouns are in overlapping distribution. That is, both terminals require that their complement be marked for countability. This would explain why object mass nouns are never number-marked. In addition, it is consistent with the idea that count NPs are just a subset of the NPs that are countable: {count NPs, object mass NPs}.

After motivating that the generalization in (9) holds for object mass nouns with a collective interpretation and establishing the structural parallel between Number morphemes and the object mass morpheme, I will develop a proposal according to which the distributional and interpretive properties of this object mass nouns follow from the contained representation in (11a). I will argue, contra the traditional view, that the additional piece of structure descriptively labeled in (9) as OBJECT MASS is not a [PL] feature. I will refer to it as a [COLL(ECTIVE)] feature, following De Belder (2013); Alexiadou (2015); Lieber (2016), and argue that it is located on an outer nominalizing head at least in English and Spanish. I will show that the representation of object mass nouns with an eventive interpretation is also consistent with the generalizations and the containment hypothesis. Last but not least, I will show that the distribution of the [COLL] feature is subject to cross-linguistic variation, very much like [PL] is (Ghomeshi 2003; Acquaviva 2008; Wiltschko 2008, 2021; Alexiadou 2011; Kramer 2016). This is what distinguishes English/Spanish from Czech.

At a more general level, this investigation raises questions about the encoding of the count-mass distinction and countability. In particular, it will shed light on the following issues: what makes an NP count as opposed to mass? What makes countable NPs, both count and mass, form a natural class? What determines variation in this domain?

## 2 Data management

Most of the data in this article come from English and Spanish. Unless otherwise noted in the text, uncited data report the judgments of 14 adult native English speakers and 18 adult native Spanish speakers, including the author. All the native English speakers, five of whom were linguists, spoke different varieties of North American English listed here: Canadian (x2), California (x7), Nebraska, New Jersey, Oklahoma, Ohio and Wisconsin. There was a total of 6 women and 8 men; all had a college degree and 7/14 held PhDs. The average age of the group was 38 years old (30-48). The native Spanish speakers, none of

whom were linguists except the author, spoke different varieties of Iberian and American Spanishes. The former included Córdoba (x2), Madrid (x3), Tarragona and Valladolid (x7). The latter included Mexican (Mexico City, Santiago and Mexicali, x3) and Peruvian (Lima, x2). There was a total of 9 women and 9 men; all of them had a college degree; only 5/18 had a post-BA education, and 4 of them held PhDs. The average age of the group was 44 years old (30-67).

Data elicitations, carried out both in-person and over email, conformed to the general principles for conducting fieldwork (Matthewson 2004; Bochnak and Matthewson 2015, 2020; Kibrik 2017; Gribanova 2022). The main method of elicitation consisted of grammaticality and felicity judgments. These judgment tasks typically involved a binary evaluation (acceptable vs. not acceptable, or acceptable in context vs. not acceptable in context). For sentences that require a judgement about interpretation verbal or written presentation of the relevant discourse context was provided. Evaluation on a Likert scale from 1 to 7 was used when more fine-grained judgments were needed.

Data and insights from other languages come from a selection of documents including published journal articles, conference proceedings, edited volumes and descriptive grammars. The sources for these are appropriately cited in text or next to the relevant example.

### 3 The count-mass distinction: basic distributional facts

It has been generally observed that there are important morpho-syntactic asymmetries between the class of count and the class of mass nouns. Among these asymmetries, we can distinguish the list in (13). Nouns that allow all these properties are ‘count’ while those that do not allow any or most of these are referred to as ‘mass’.<sup>1</sup>

- (13) a. **Number marking:** Does the noun make a singular/plural distinction?  
 b. **Modification:** Can the noun be modified by  
     i. cardinal numerals?; (Pelletier 1975; Bunt 1979, 1985; Chierchia 1998, 2010)  
     ii. size/shape adjectives? (Quine 1960; Schwarzschild 2011; Deal 2017)  
 c. **Determiners:** Can the noun occur with certain determiners (e.g. *every*, *several*)?  
     (Doetjes 1997, 2021; Chierchia 1998)

As the examples in (14) show, there is a difference between NPs like *jewel* and *blood* when it comes to number-marking: only the former have a singular/plural distinction.<sup>2</sup> NPs like *jewelry* pattern with *blood* in this respect. These pattern are replicated in (15) for Spanish.<sup>3</sup>

<sup>1</sup>An additional one that I will not be discussing is concerned with ellipsis options, including *one*-substitution. For details, see Bloomfield (1933); Harley (2005); Bale and Gillon (2020).

<sup>2</sup>Some expressions like *water*, *tea*, *wine*, whose roots are generally found in mass syntactic contexts, may be ‘shifted’ into a count form. Others like *mud*, *blood* cannot. In the case of the former, they have a singular/plural distinction and can be modified by cardinal numerals. When this happens, the interpretation that arises is not a mass (i.e. substance) one, but a count interpretation in terms of a unit or container. I take this to be the result of imposing a count syntax on the relevant root (Borer 2005a; Mathieu 2012). Thus, in this regard they are no different from NPs like *jewel(s)*.

(i) Johnny ordered {these wines/ one wine} for the table.

<sup>3</sup>I find it important to disclose that I am not claiming that having a particular exponents is determining evidence for a nominal expression to belong to the class of object mass nouns. To determiner whether they do, one must consider the syntactic environment in which they occur. For instance, *-ment* in *several development-s* cannot be an object mass exponent given the

- (14) a. Johnny saw {this jewel/ these jewel-s}  
 b. Johnny saw {this blood/ \*these blood-s}  
 c. Johnny saw {this jewelry/ \*these jewelri-es}
- (15) a. Johnny vio { esta joya/ esta-s joya-s} = (14a)  
 Johnny saw this.F jewel this.F-PL jewel-PL  
 b. Johnny vio { esta sangre/ \*esta-s sangre-s} = (14b)  
 Johnny saw this.F blood this.F-PL blood-PL  
 c. Johnny vio { esta joyería/ \*esta-s joyería-s} = (14c)  
 Johnny saw this.F jewelry this.F-PL jewelry-PL

In order to show that the number-marking distinction is not restricted to nouns ending in *-ery*, additional examples are given in (16).

- (16) a. This furniture, This footwear, This equipment  
 \* These furniture-s, \* These footwear-s, \* These equipment-s  
 b. El mobiliario, el follaje, el profesorado  
 the.M furniture the.M foliage the.M faculty  
 \* Lo-s mobiliario-s, \* lo-s follaje-s, \* lo-s profesorado-s  
 the.M-PL furniture-PL the.M-PL foliage-PL the.M-PL faculty-PL

Besides, there seems to be a correlation (at least in both languages) between the availability of number-marking and the possibility of cardinal numeral modification. That is, only the NPs that make a singular/plural distinction can be modified by cardinal numerals. This is illustrated in (17) for English and (18) for Spanish. In both languages, numerals higher than ‘1’ require the noun to be plural-marked.

- (17) a. Johnny saw {one jewel/ two jewel-s}  
 b. \* Johnny saw {one blood/ two blood-s}  
 c. \* Johnny saw {one jewelry/ two jewelri-es}
- (18) a. Johnny vio { una joya/ dos joya-s} = (17a)  
 Johnny saw one.F jewel two jewel-PL  
 b. \* Johnny vio { una sangre/ dos sangre-s} = (17b)  
 Johnny saw one.F blood two blood-PL  
 c. \* Johnny vio { una joyería/ dos joyería-s} = (17c)  
 Johnny saw this.F jewelry two jewelry-PL

presence of plural-marking and the plural-count determiner *several*. Similarly, nouns ending in *-ería* in Spanish can have a count interpretation when referring to a location. For example, *joyería* in (ii) picks out the store where jewelry is sold. We can assume that the underlying structures of the count-location and object mass nouns must differ, despite the fact that the same vocabulary item *-ería* is spelled out (De Belder 2013; Lieber 2016).

- (ii) { La joyería/ la-s (dos) joyería-s } de la calle Serrano de Madrid  
 the.F jewelry the.F-PL two jewelry-PL of the street Serrano of Madrid  
 ‘The (two) jewelry store(s) in Calle Serrano in Madrid’



(19) a. The small {jewel/ chair} The {jewel/ chair} is small  
 b. The small {jewels/ chairs} The {jewels/ chairs} are small  
 c. \*The small blood \*The blood is small  
 d. The small {jewelry/ furniture} The {jewelry/ furniture} is small

(20) a. La {joya/ piel} pequeña, La {joya/ piel} es pequeña  
 The.F jewel fur small.F the.F jewel fur is small.F  
 ‘The small {jewel/ fur}’, ‘The {jewel/ fur} is small.’  
 b. La-s {joya-s/ piel-es} pequeña-s, La-s {joya-s/ piel-es} son pequeña-s  
 The.F-PL jewel-PL fur-PL small.F-PL the.F-PL jewel-PL fur-PL are small.F-PL  
 ‘The small {jewels/ furs}’, ‘The {jewels/ furs} are small.’  
 c. \*La sangre pequeña, La sangre es pequeña  
 The.F blood small.F the.F blood is small.F  
 ‘The small blood’, ‘The blood is small.’  
 d. La {joyería/ peletería} pequeña, La {joyería/ peletería} es pequeña  
 The.F jewelry furriery small.F the.F jewelry furriery is small.F  
 ‘The small {jewelry/ furriery}’, ‘The {jewelry/ furriery} is small.’

(21) a. Johnny saw {each/ every} jewel.  
b. \* Johnny saw {each/ every} jewels.  
c. \* Johnny saw {each/ every} blood.  
d. \* Johnny saw {each/ every} jewelry.

(22) a. \* Johnny saw several jewel.  
b. Johnny saw several jewel-s.  
c. \* Johnny saw several {blood(-s)/ dreg-s}.  
d. \* Johnny saw several jewelry(-s).

(23) a. Which jewel(s) did Johnny see?  
b. \* Which {blood/ dregs} did Johnny see?  
c. \* Which {jewelry/ furniture} did Johnny see?

The three classes of determiners are also observed in Spanish: *cada* ‘each’ is only compatible with singular count nouns in (24); *vari-o/a-s* ‘several-M/F-PL’ is only compatible with plural count nouns in (25); indefinite *algún* is compatible with count nouns regardless of their number, in (26).<sup>4</sup>

- |   |   |
|---|---|
| <p>(24) a. Johnny vio cada joya.<br/>Johnny saw each jewel</p> <p>b. * Johnny vio cada joya-s<br/>Johnny saw each jewel-PL</p> <p>c. * Johnny vio cada sangre<br/>Johnny saw each blood</p> <p>d. * Johnny vio cada joyería<br/>Johnny saw each jewelry</p> | <p>(25) a. * Johnny vio varias joya.<br/>Johnny saw several.F.PL jewel</p> <p>b. Johnny vio varias joya-s<br/>Johnny saw several.F.PL jewel-PL</p> <p>c. * Johnny vio varias sangre<br/>Johnny saw several.F.PL blood</p> <p>d. * Johnny vio varias joyería<br/>Johnny saw several.F.PL jewelry</p> |
|---|---|
- 
- |   |  |
|---|--|
| <p>(26) a. Johnny vio alguna joya.<br/>Johnny saw some.F jewel<br/>‘Johnny saw {some/ a} jewel’</p> <p>b. Johnny vio alguna-s joya-s<br/>Johnny saw some.F-PL jewel-PL<br/>‘Johnny saw some jewels’</p> | <p>c. * Johnny vio alguna sangre<br/>Johnny saw some.F blood<br/>Int.: ‘Johnny saw a blood’</p> <p>d. * Johnny vio alguna joyería<br/>Johnny saw some.F jewelry<br/>Int.: ‘Johnny saw a jewelry’</p> |
|---|--|

I have kept using the object mass noun *jewelry* in English and in Spanish to establish a consistent minimal pair with the count noun counterpart *jewel*, but these are to be taken as representative examples of the whole class. In addition, this is so because in Spanish the object mass noun may have a different gender than the count noun counterpart, a point I will come back to later on. As far as I understand, there are no distributional differences between *furniture*, *jewelry*, *baggage*, *carpeting* regarding the properties being surveyed here. To illustrate that this is also the case in Spanish, examples with the pairs *mueble* ‘furniture<sub>CT</sub>’ and *mobiliario* ‘furniture’ are given in (27)-(29).

- (27) Cardinal numeral modification
- a. Johnny compró { un mueble/ dos mueble-s}  
Johnny bought one.M furniture.CT two furniture.CT-PL  
‘Johnny bought {one furniture piece/ two furniture pieces}’
- b. \* Johnny compró { un mobiliario/ dos mobiliario-s}  
Johnny bought one.M furniture two furniture-PL  
‘Johnny bought {one furniture/ two furnitures}’
- (28) Size/Shape adjective modification
- a. El mueble pequeño, lo-s mueble-s pequeño-s  
the.M furniture.CT small.M the.M-PL furniture.CT-PL small.M-PL  
‘The small furniture piece, the small furniture pieces’

<sup>4</sup>Determiner *cada* is gender and number invariant, i.e. it does not mark overt gender agreement and cannot be plural-marked; Determiner *varios* is number invariant, i.e. it marks overt gender agreement but lacks a number unmarked counterpart.



- b. El mobiliario pequeño  
the.M furniture small.M  
'The small furniture'

(29) Determiner choice

- a. Cada { mueble/ \*mueble-s/ \*mobiliario} (singular count D)  
each furniture.CT furniture.CT-PL furniture
- b. Vario-s { \*mueble/ mueble-s/ \*mobiliario} (plural count D)  
several.M-PL furniture.CT furniture.CT-PL furniture
- c. Algún { mueble/ \*mobiliario}, Alguno-s { mueble-s/ \*mobiliario(-s)}  
some.M furniture.CT furniture some.M-PL furniture.CT-PL furniture-PL  
(only count D)

The data discussed so far has served to group nouns into two categories based on a series of grammatical properties such as number-marking, numeral and adjectival modification and sensitivity to determiners. Nouns that showed all these are 'count' while those that do not allow any or most of these are referred to as 'mass'. Within 'mass', there are three classes: unmarked mass (e.g. *blood, water*), plural-marked (e.g. *dregs*) and object mass (e.g. *jewelry, furniture*). Regarding the last of these subclasses, we observed some degree of distributional overlap with (singular/plural) count nouns; namely, size/shape adjective modification. These properties are summarized in Table 1.

Table 1: Morpho-syntactic properties of mass & count nouns (English & Spanish)

	unmarked Mass	PL Mass	Obj. Mass	CT
SG/PL distinction	*	*	*	✓
Modification by numerals	*	*	*	✓
Modification by size APs	*	*	✓	✓
Compatible with <i>each/every, cada</i>	*	*	*	✓
Compatible with <i>several, varios</i>	*	*	*	✓
Compatible with <i>which, algun(os)</i>	*	*	*	✓

## 4 Object mass nouns: morpho-syntactic complexity

### 4.1 The importance of doublets

A close examination of the object mass data shows that a significant number of them, if not all, is morphologically complex. First of all, the root morphemes that participate in the class of object mass nouns also participate in the class of count nouns giving rise to doublets like the ones in (30) for English, and (31). In every set of examples, the count member of the doublet is in the singular (e.g. unmarked) form. The English data have been organized by the morphemes identified in Cohen (2020). Some object mass morphemes in Spanish, namely *-aje*, *-ería* are more productive than others such as *-(i)ario*.

(30) Count and object mass noun doublets in English

- |   |  |
|---|--|
| <p>a. <b>SG-CT</b>   <b>Obj. Mass</b>   (-ware)</p> <p>kitchen   kitchen-ware</p> <p>table   table-ware</p> <p>gift   gift-ware</p> <p>dish   dish-ware</p> <p>b. <b>SG-CT</b>   <b>Obj. Mass</b>   (-wear)</p> <p>foot   foot-wear</p> <p>beach   beach-wear</p> <p>day   day-wear</p> <p>neck   neck-wear</p> <p>c. <b>SG-CT</b>   <b>Obj. Mass</b>   (-(e)ry)</p> <p>jewel   jewel-(e)ry</p> <p>drape   drape-ry</p> <p>gadget   gadget-ry</p> <p>image   image-ry</p> | <p>d. <b>SG-CT</b>   <b>Obj. Mass</b>   (-age)</p> <p>bag   bagg-age</p> <p>lug   lug-age</p> <p>word   word-age</p> <p>sign   sign-age</p> <p>e. <b>SG-CT</b>   <b>Obj. Mass</b>   (-ing)</p> <p>light   light-ing</p> <p>carpet   carpet-ing</p> <p>bed   bedd-ing</p> <p>pipe   pip-ing</p> |
|---|--|

(31) Count and object mass noun doublets in Spanish

- |   |  |
|---|--|
| <p>a. <b>SG-CT</b>   <b>Obj. Mass</b>   (-mento)</p> <p>arma   arma-mento</p> <p>‘weapon’   ‘weaponry’</p> <p>carga   carga-mento</p> <p>‘load’   ‘collection of goods’</p> <p>equipo   equipa-miento</p> <p>‘outfit/utensil’   ‘utensils’</p> <p>b. <b>SG-CT</b>   <b>Obj. Mass</b>   (-aje)</p> <p>hoja   foll-aje</p> <p>‘leaf’   ‘foliage’</p> <p>peón   peon-aje</p> <p>‘laborer’   ‘collection of laborers’</p> <p>equipo   equip-aje</p> <p>‘outfit/utensil’   ‘baggage’</p> | <p>c. <b>SG-CT</b>   <b>Obj. Mass</b>   (-ería)</p> <p>joya   joy-ería</p> <p>‘jewel’   ‘jewelry’</p> <p>chiquillo   chiquill-ería</p> <p>‘little kid’   ‘collection of little kids’</p> <p>cubierto   cubert-ería</p> <p>‘silverware<sub>CT</sub>’   ‘silverware’</p> <p>d. <b>SG-CT</b>   <b>Obj. Mass</b>   (-ado/a)</p> <p>profesor   profesor-ado</p> <p>‘teacher’   ‘faculty’</p> <p>alcantarilla   alcantarill-ado</p> <p>‘sewer’   ‘sewerage’</p> <p>vaca   vac-ada</p> <p>‘cow’   ‘collection of cows’</p> <p>e. <b>SG-CT</b>   <b>Obj. Mass</b>   (-iario)</p> <p>mueble   mobil-iario</p> <p>‘furniture<sub>CT</sub>’   ‘furniture’</p> |
|---|--|

Looking at the data in these examples, we observe that the same root morpheme that is found in a count noun is also found in the object mass noun counterpart. This is a common pattern across all the morphemes identified in the two languages. In some cases, the root has undergone allomorphy in the presence of the object mass affix. This is illustrated by pairs such as the following in Spanish: *mueble*<sub>SG,CT</sub> ‘furniture<sub>CT</sub>’ vs *mobil-iario*<sub>object mass</sub> ‘furniture’; *cubierto*<sub>SG,CT</sub> ‘silverware<sub>CT</sub>’ vs *cubert-ería*<sub>object mass</sub> ‘silverware’.

In addition to the overlap of roots across classes of nouns, we should note that some of the object mass morphemes in the tables (namely *-age*, *-ing* and *-ery* for English, and *-aje*, *-mento* and *-ado* in Spanish) may give rise to (at least) two different types of interpretations, depending on what the category of the base might be, i.e. nominal or verbal (Lieber 2004, 2016; Alexiadou 2015; Cohen 2020): (i) a collective

interpretation, i.e. ‘the collection of X-related things’; and, (ii) an eventive interpretation, i.e. ‘the result of doing X or being an X’. As a result some object mass nouns may be ambiguous between the two. A example is given in (32) for English and in (33) for Spanish.

- (32) carpeting
- a. collection of carpet-looking items (collective)
  - b. the result of covering a surface with a carpet (eventive)
- (33) alcantarillado ‘sewage lines/sewerage’
- a. collection of sewer-lines (collective)
  - b. the result of installing sewers (eventive)

Second of all, the data indicate an additional pattern. The count forms on the table, which correspond to the singular form, can be decomposed into the following sequence of morphemes in (34), assuming that roots themselves bear no category label (Halle and Marantz 1993; Marantz 1997; Harley and Noyer 1998; Harley 2014).

- (34)  $\sqrt{\text{ROOT}}-n_{\text{COUNT}}\text{-Number}$ .

I will refer to the grouping of the root and the  $n$  morphemes in (34) as the ‘countable base’. Descriptively, we can take this to mean the root that has been marked countable and has been assigned a countable meaning, i.e. a predicate that has atoms and their sums, as opposed to a non-countable one, i.e. a predicate that is closed under sum but has no atoms in its extension. See Bunt (1979, 1985); Krifka (1989); Chierchia (1998, 2010, 2021); Bale and Barner (2009); Rothstein (2010, 2017). Number is added to the countable base to mark the noun as singular or plural. Looking at the object mass counterparts then, it seems that the countable base serves as the base for the object mass morpheme to be attached. Crucially the opposite does not hold; that is, the object mass stem is not the base to which number morphemes are added.

Restricting ourselves to the collective cases, for the moment, these observations are consistent with the structural descriptions in (35) for both count and object mass nouns. I take these descriptions as evidence for the generalization in (9) repeated below:

- (35) a.  $\left[ \underbrace{[\sqrt{\text{ROOT}} n_{\text{COUNT}}]}_{\text{jewel}} \underbrace{\alpha_{\text{OBJECT MASS}}}_{\text{-ery}} \right]$  (to be updated)
- b.  $\left[ \underbrace{[\sqrt{\text{ROOT}} n_{\text{COUNT}}]}_{\text{jewel}} \underbrace{\text{Number}_{\text{SG/PL}}}_{\text{-}\emptyset\text{/s}} \right]$

**(9) The Countable Base Generalization**

Object mass nouns are built on top of the same countable base (e.g. root+categorizer) as count nouns.

The insight behind the generalization is that the grammatical representation of object mass nouns has a nominal core consisting of a root and a categorizer that makes the root countable. This core is the exact same one that count nouns are built on. Where the two differ is in the extra piece of structure: count nouns have Number which may be either singular or plural, but object mass nouns do not have Number. For now, we can label this node as ‘ $\alpha$ ’ to differentiate it from Number but also stay neutral about its precise category.

There is a potential caveat to this generalization, regarding doublets. Despite the fact that doublets are common and productive, it is not the case that every object mass noun has a count noun counterpart. For example, in English there are some well-known lexical gaps. There is no vocabulary item *\*furn*, *\*cutle* or *\*equip* that means ‘furniture piece’, ‘cutting tool’ or *equipment piece* respectively. The lack of the count vocabulary item may thus be seen as a serious issue for the generalization.

However, the fact that these prototypical object mass nouns lack a count noun counterpart does not entail that these nouns are morphologically simplex. In fact, vocabulary items like *furniture* and *cutlery* can be decomposed into smaller parts. In the case of the former, the surface form is related to expressions such as *furnish* (verb) and *furnishing* (gerund, noun): all three forms share a root  $\sqrt{\text{FURN}}$ . Similarly, in the case of *cutlery*, the noun is related to the expression *cutlet* (noun) which is also related to *cut* (noun, verb): all three vocabulary items are related by virtue of sharing the same root  $\sqrt{\text{CUT}}$ . The situation with *equipment* is the same: *equip* (verb) and *equipment* both share the same root  $\sqrt{\text{EQUIP}}$ . Therefore, it does not seem unreasonable to hypothesize that these object mass nouns are also morphologically complex, as summarized in Table 2.<sup>5</sup> What begs an explanation is why there is no singular/plural count vocabulary item.

Table 2: Morphologically complex object mass nouns with no count noun counterpart

SG-CT	Obj. mass	Root
–	<i>furniture</i>	$\sqrt{\text{FURN}}$
–	<i>cutlery</i>	$\sqrt{\text{CUT}}$
–	<i>equipment</i>	$\sqrt{\text{EQUIP}}$

#### 4.2 The object mass morpheme is not [PL]

One of the challenges with object mass nouns is their resistance to take plural-marking. A possible hypothesis that is consistent with the generalization in (9), and the structural representations in (35), is that the object mass morpheme we have identified is itself [PL]. This is in line with the insights from traditional view outlined in the introduction. Besides, this hypothesis is attractive on semantic grounds: the semantic effect that this morpheme contributes is very similar to [PL]. In fact, it is generally assumed that these nouns denote individuated pluralities, i.e. sets of atoms and their sums (Gillon 1992; Chierchia 1998, 2010, 2021; Bale and Barner 2009; Rothstein 2010, to name some examples).

However, it would be problematic and unmotivated to call the syntactic terminal  $\alpha$  in (35a) [PL]. For starters, it is never exponed as [PL] and it never triggers plural agreement both DP-internally and externally. This is shown in (36) for English.

- (36) a. Johnny sold this {furniture/ equipment/ jewelry/ kitchenware}.
- b. \* Johnny sold these {furniture/ equipment/ jewelry/ kitchenware}.
- c. {Furniture/ Equipment/ Jewelry/ Kitchenware} is sold here.
- d. \* {Furniture/ Equipment/ Jewelry/ Kitchenware} are sold here.

<sup>5</sup>We can think about the relation between these forms in parallel to the relation that exists between *sing(s)*, *singer*, *sang* and *song*: they are not lexical primitives, but are all related to the root  $\sqrt{\text{SING}}$  (Embick 2015, p.18).

In English, the unmarked form of the demonstrative must surface, e.g. (36a); in fact, the PL-marked form of the demonstrative leads to ungrammaticality, e.g. (36b). Likewise, the verb must agree in third person singular with the object mass noun subject, e.g. (36c). Attempting third person plural agreement is unacceptable, e.g. (36d). The same agreement patterns are observed in the Spanish examples in (37).

- (37) a. Johnny vendió el { mobiliario/ armamento/ equipaje }  
 Johnny sold the.M furniture weaponry baggage  
 ‘Johnny sold the { furniture/ weaponry/ baggage }’  
 b. \* Johnny vendió lo-s { mobiliario/ armamento/ equipaje }  
 Johnny sold the.M-PL furniture weaponry baggage  
 ‘Johnny sold the<sub>PL</sub> { furniture/ weaponry/ baggage }’  
 c. El { mobiliario/ armamento/ equipaje } es caro  
 the.M furniture weaponry baggage is expensive.M  
 ‘The { furniture/ weaponry/ baggage } is expensive’  
 d. El { mobiliario/ armamento/ equipaje } son caro-s  
 the.M furniture weaponry baggage are expensive.M-PL  
 ‘The { furniture/ weaponry/ baggage } are expensive’

In the Spanish examples, the definite determiner must also be unmarked for number, *el* ‘the.M’ in (37a) as opposed to *los* ‘the.M.PL’ in (37b). Besides, the (copula) verb must agree in third person singular with the object mass noun subject, and the predicative adjective is also unmarked for number, in (37c). Again, attempting plural agreement on both the verb and the predicative adjective in (37d) results in ungrammaticality.

Second, allomorphy is conditioned by the terminal nodes and the features on them, given that certain locality and domain requirements are met, rather than the vocabulary items themselves. Thus, if this terminal node  $\alpha$  was in fact Num[PL] we would expect it to trigger the same types of root allomorphy that [PL] does. However, this prediction is not borne out. Some English data are given in (38) and (39).<sup>6</sup>

- (38) a.  $\sqrt{\text{LEAF}} \Leftrightarrow \text{leave}/ \_ \text{Num}[\text{PL}]$  ‘leaves’  
 b.  $\sqrt{\text{LEAF}} \Leftrightarrow \text{foli}/ \_ \alpha_{\text{OBJECT MASS}}$  ‘\*leavage’, ‘foliage’  
 (39) a.  $\sqrt{\text{FOOT}} \Leftrightarrow \text{feet}/ \_ \text{Num}[\text{PL}]$  ‘feet’  
 b.  $\sqrt{\text{FOOT}} \Leftrightarrow \text{foot}/ \_ \alpha_{\text{OBJECT MASS}}$  ‘\*feetware’, ‘footware’

<sup>6</sup>Two notes are in order here. First, following Harley (2014), I am assuming that (i) roots have no phonological/semantic form by themselves and (ii) roots are abstract indices that are mapped to a form and meaning depending on the syntactic context in which they are found. For expository and descriptive purposes, however, I will refrain from the index representation. Second, when looking at the rules, the reader might be wondering where the categorizing  $n$ -head is in the contextual specification. For ease of representation, I have left it out of the formulation of the rules here. The full contextual representation is something like the following in (iii).

(iii)  $\sqrt{\text{ROOT}} \Leftrightarrow \text{root}/ \_ \text{Num}[\text{PL}]/ \alpha_{\text{OBJECT MASS}}$

For now it is just worth mentioning that any theory of allomorphy must account for the fact that Num[PL] may trigger allomorphy on the root past the nominalizer, just like T does on the root past the verbalizer, considering that allomorphy is constrained by locality (Embick 2010, 2015; Bobaljik 2012; Moskal 2015; Moskal and Smith 2016; Bobaljik and Harley 2017). In footnote 23, I discuss two approaches to this: the cyclic+zero-morph approach from Embick (2010) and the Hyper-Contextual VI rule approach from Moskal and Smith (2016). I show that, for the purposes of this paper, nothing hinges on this choice.

In (38), [PL] triggers the insertion of the vocabulary item *leave*; if we supplant the Number feature with  $\alpha$ , a different vocabulary item is inserted: *foli-*. A perhaps more compelling case is (39). The root for *foot* has a suppletive allomorph in the plural: *feet*. In contrast,  $\alpha$ , responsible for the object mass counterpart, does not trigger suppletion of the root, which surfaces as the unmarked or elsewhere form, e.g. *foot*. Similar allomorphy contrasts can be found in Spanish. Some representative examples are in (40)-(42).

- (40) a.  $\sqrt{\text{HOJ}} \Leftrightarrow \text{hojal} \text{ } \_ \text{Num}[\text{PL}]$  ‘hojas’ (*leaves*)  
b.  $\sqrt{\text{HOJ}} \Leftrightarrow \text{folll} \text{ } \_ \alpha_{\text{OBJECT MASS}}$  ‘\*hojaje’, ‘follaje’ (*foliage*)
- (41) a.  $\sqrt{\text{MUEBL}} \Leftrightarrow \text{mueblel} \text{ } \_ \text{Num}[\text{PL}]$  ‘muebles’ (*furniture*<sub>count.pl</sub>)  
b.  $\sqrt{\text{MUEBL}} \Leftrightarrow \text{mobill} \text{ } \_ \alpha_{\text{OBJECT MASS}}$  ‘\*muebliario’, ‘mobiliario’ (*furniture*<sub>mass</sub>)
- (42) a.  $\sqrt{\text{CUBR}} \Leftrightarrow \text{cubiertol} \text{ } \_ \text{Num}[\text{PL}]$  ‘cubierto’ (*silverware piece*)  
b.  $\sqrt{\text{CUBR}} \Leftrightarrow \text{cubertl} \text{ } \_ \alpha_{\text{OBJECT MASS}}$  ‘\*cubiertería’, ‘cubertería’ (*silverware*)

The Spanish case in (40) parallels the *leave/foilage* contrast: a plural feature does not trigger suppletion of the root, but the object mass counterpart feature does. The cases in (41) and (42) show a different type of allomorphy, but allomorphy nonetheless. In (41), the *b*-form lack a diphthong and involves metathesis of the liquid and the vowel, which has shifted in height. In (42), the *b*-form lacks a diphthong as well.

In addition to this morpheme not being [PL], these nouns cannot bear a [SG] feature either. If these nouns were [SG]-marked, we would expect them to form a natural class with singular count nouns with respect to some property beyond singular agreement.<sup>7</sup> However, this is not the case either. For example, Chierchia (1998) observes that universally there is no determiner that exclusively selects for singular count nouns and mass nouns, for example. In fact, some determiner-like elements such as quantity adjectives (e.g. *much*, *many*, *more*) are compatible with plural count nouns and mass nouns to the exclusion of singular count nouns. Some examples are in (43) and (44) with the comparative form of the quantity adjective.

- (43) a. more {blood/ dreg-s/ jewelry} (*more* + mass NP)  
b. more {\*jewel/ jewel-s} (*more* + count NP-{\*SG/ PL})
- (44) a. más {sangre/ baba-s/ joyería}  
more blood drool-PL jewelry  
‘more {blood/ drooling/ jewelry} (*more* + (any) mass NP)
- b. más {\*joya/ joya-s}  
more jewel jewel-PL  
‘more {\*jewel/ jewel-s} (*more* + count NP-{\*SG/ PL})

As the examples show, quantity adjectives are grammatical with all types of mass nouns in (43a) and (44a): unmarked (e.g. *blood*, *sangre*), PL-marked (e.g. *dregs*, *babas* ‘drooling’) and object mass (e.g. *jewelry*, *joyería*). They are also acceptable with plural count nouns, but unacceptable with their singular counterparts, in (43b) and (44b). The reason behind this restriction is found in the structure of the extension of the NP: mass nouns and plural count nouns have cumulative extensions whereas singular

<sup>7</sup>Singular agreement need not entail [SG]-marking. Singular agreement may arise as the default option in the absence of any number feature being present (Cowper 2005; Nevins 2007, 2011; Coon and Keine 2021; Toquero-Pérez 2024).



count nouns do not (Quine 1960; Cheng 1973; Krifka 1989; Chierchia 1998; Borer 2005a). The presence of a [SG] feature results in a non-cumulative NP, whereas a non-[SG]-marked NP may be cumulative.<sup>8</sup>

Note that if object mass nouns were really [SG]-marked, one would not only need to find an alternative explanation for the asymmetries in (43) and (44), but also for the following two sets of facts. The first one would be related to number-marking: why can object mass nouns be [SG]-marked but cannot pluralize? This issue is puzzling in particular because [SG] and [PL] are both features located in the same Number head (Ritter 1991; Harbour 2007, 2011; Cowper and Hall 2009, 2014). Thus, one would need to account for why these nouns are compatible with one feature but not the other. The second fact is related to determiners: if these nouns are [SG]-marked, and share with count nouns marking for countability, why can't they occur with *every*, *each*, *which* or their relevant cross-linguistic counterparts?

Despite the fact that the object mass morpheme and Number morphemes, and in particular [PL], are distinct, they share some notable properties. They may both trigger allomorphy on the root, e.g. (38) and (39), and, as the structural descriptions in (35) indicate, the syntactic position that they occupy is very much the same. Based on these facts, and the observation that Number and the object mass morpheme never co-occur, I propose the hypothesis in (45).<sup>9</sup>

(45) **The Number-Object Mass Morpheme Overlap**

Number and the object mass terminal are in overlapping distribution, i.e. they both require complementation by  $n_{\text{COUNT}}$ .

### 4.3 The object mass morpheme is a nominalizer

Up to this point, I have presented some arguments that question the Number status of the object mass morpheme (at least in these languages). This raises the question of what category this terminal node belongs to. Building on De Belder (2013, p.42), I am going to hypothesize that this morpheme is actually a nominalizer of category  $n$  in these languages.<sup>10</sup>

Pretheoretically at least, it is argued that morphemes generating object mass nouns in these languages are 'derivational', rather than 'inflectional'. One of the hallmark properties of derivational morphemes is that they can change the category of the base they attach to. This is true of the object mass morpheme. The same morpheme can create (mass) nouns out of other nouns, but also out of verbs. Some examples are given in (46)-(47), where category labels on the base are taken descriptively at face value.<sup>11</sup>

- (46) a.  $\text{carpet}_V + \text{OBJECT MASS} \rightarrow \text{carpeting}_N$   
b.  $\text{carpet}_N + \text{OBJECT MASS} \rightarrow \text{carpeting}_N$   
c.  $\text{jewel}_N + \text{OBJECT MASS} \rightarrow \text{jewelry}_N$
- (47) a.  $\text{alcantarillar}_V + \text{OBJECT MASS} \rightarrow \text{alcantarillado}_N$   
b.  $\text{alcantarilla}_N + \text{OBJECT MASS} \rightarrow \text{alcantarillado}_N$   
c.  $\text{vaca}_N + \text{OBJECT MASS} \rightarrow \text{vacada}_N$

<sup>8</sup>See also Toquero-Pérez (2024) for the effect of [SG]-marking on NPs and the consequences for cumulativity.

<sup>9</sup>Two elements  $\alpha$  and  $\beta$  are in overlapping distribution if  $\alpha$  and  $\beta$  can both occur in context  $C$  and the choice between the two can indicate a difference in meaning, (Bale and Reiss 2018).

<sup>10</sup>This is also the case in Dutch, (De Belder 2013).

<sup>11</sup>In section 6, I will discuss the eventive object mass nouns in detail and argue that their representation is consistent with the containment hypothesis.

As observed in the examples above, adding the object mass terminal to the base seems to recategorize the base into a noun. In addition, related to this recategorization, the effect that the object mass morpheme has on the interpretation of the stem may be idiosyncratic. That is, while the object mass morpheme seems to create collections, these are not collections of X-items, where ‘X’ stands for whatever the base denotes, but collections of items that stand in a relation with whatever the base denotes. That relation seems to be underspecified. For instance, if we think about what it means for something to qualify as ‘jewelry’, we can intuitively say something along these lines: jewelry is a collection of items that are canonically made from or contain jewels. Thus, we can think of the ‘made of/contains’ as the value for the relation introduced by the object mass morpheme in the case of the base *jewel*.<sup>12</sup> Similarly, ‘footware’ can be thought of as ‘a collection of items that are worn by someone’s feet’.

Under decompositional approaches to morpho-syntax, such as Distributed Morphology (Halle and Marantz 1993), the difference between derivation and inflection is not a grammatical primitive but domain and category-driven. Derivational morphemes are generally represented by categorizing heads and inflectional morphemes correspond to functional heads such as those encoding number, person, definiteness or case (Marantz 1997, 2001, 2013; Arad 2003; Embick and Marantz 2008; Kramer 2015; Wood 2023). In this regard, labelling the object mass morpheme as *n* as opposed to Number is consistent with this view.

In addition to creating new nouns, the object mass morpheme bears other properties that are characteristic of nominalizers such as changes in gender and declension class of the base. This is the case in Spanish. In Spanish, nouns themselves do not generally spell out gender, but class. That is, the word marker attached to the nominal root is a class exponent, not a gender marker. I am assuming following Kramer (2015) the following three declension classes: Class 1, nouns ending in *-o*; Class 2, nouns ending in *-a*, and Class 3, nouns ending in *-e*. Many nouns of Class 3 do not have an overt exponent in the singular form, but *-e* always shows up in the plural, e.g. (48). For more information about declension classes in Spanish, see Roca (1989); Harris (1991); Kramer (2015).

- |      |   |                |            |               |                                |
|------|---|----------------|------------|---------------|--------------------------------|
| (48) | Class 1                                       |                | Class 2    |               | Class 3                        |
|      | man-o,  | man-o-s        | dí-a,      | dí-a-s        | lápiz-Ø, lápiz-e-s             |
|      | hand-F.CLS1                                   | hand-F.CLS1-PL | day-M.CLS2 | day-M.CLS2-PL | pencil-M.CLS3 pencil-M.CLS3-PL |
|      | ‘hand, hands’, ‘day, days’, ‘pencil, pencils’ |                |            |               |                                |

Looking at the relevant data, the example in (49) shows both a shift in declension class and a shift in gender. In (49a), the nominal base is feminine and spells out declension Class 2, e.g. *-a*, whereas the derived object mass noun in (49b) is masculine and spells out declension Class 1, e.g. *-o*. Agreement between the noun in (49a) and determiners and modifiers must be masculine. A similar example is given in (50). A slightly different example is the one in (51), where we observe a declension class shift but not a gender shift.

<sup>12</sup>In the article *This Guide to Jewellery Production* by Dauvit Alexander, the author, a professional jeweler, states the following: “Jewellery is broadly defined as “ornament for the body [...] the majority of jewellery can be described as being wearable ornaments, often made from high-value materials such as precious metals and gemstones” (<https://make.works/blog/guide-to-jewellery>). Besides, if we look at what is a dictionary definition of ‘jewel’, Cambridge English Dictionary online defines it as follows: ‘a precious stone that is used to decorate valuable objects’ (<https://dictionary.cambridge.org/us/dictionary/english/jewel>).

- (49) a. arm-a  
           weapon-F.CLS2  
           ‘(a) weapon’  
       b. arm-a-ment-o  
           weapon-F.CLS2-COLL-M.CLS1  
           ‘weaponry’
- (50) a. grad-a  
           grandstand-F.CLS2  
           ‘(a) grandstand’
- b. grad-erí-o  
               grandsand-COLL-M.CLS1  
               ‘Collection of grandstands’
- (51) a. muebl-e  
           furniture-M.CLS3  
           ‘(a) furniture piece’  
       b. mobil-iari-o  
           furniture-COLL-M.CLS1  
           ‘furniture’

All these data support the observation that these nominal changes are systematic and quite common. If gender is located on the nominalizer (Alexiadou 2004; Kramer 2015) and class markers on the noun are also on *n* (Oltra-Massuet and Arregi 2005; Embick 2010; Kramer 2015; Kučerová 2018), the fact that object mass nouns may undergo shifts in both class marker exponence and gender is strong evidence for the *n*-status of the morpheme in Spanish too.<sup>13</sup> As a result, the structural description in (35a) can be finally updated.

$$(35a) \quad \left[ \left[ \underbrace{\sqrt{\text{ROOT}} \ n_{\text{COUNT}}}_{\text{jewel}} \right] \underbrace{n_{\text{OBJECT MASS}}}_{\text{-ery}} \right] \quad (\text{final version})$$

#### 4.4 Summary

After showing that object mass nouns are indeed mass with respect to their syntactic properties in §2, modulo size/shape adjective modification, I have made the following novel observation: object mass nouns and count nouns share a ‘countable core’, i.e. root and categorizer. This is captured by the generalization in (9). The insight of this generalization leads to the hypothesis in (10) repeated below.

(10) The representation of object mass (and count nouns) properly contains a countable base.

Where the types of nouns differ, however, is in the morpheme that occupies the position above the categorizer that the root adjoins to: Number for count nouns, marking the noun as singular or plural; and a nominalizer in the case of object mass nouns. The picture that emerges is twofold. First, we can hypothesize that countability, i.e. the property of being measured in terms of cardinality, is syntactically determined: count nouns (both singular and plural) and object mass nouns form a natural class by virtue of sharing the countable base. Second, Number and the object mass nominalizer are in overlapping distribution, as formulated in the hypothesis in (45): where you find one, you do not find the other. If correct, this is key because it provides an avenue for the explanation of these nouns’ resistance to be number-marked. Both Number and this nominalizer require a countable-marked complement; that is, the two terminals select for the same sister, which suggests that the two terminals are in competition with each other. In what is left of the paper, I develop a theory that accounts for the properties and the generalizations outlined.

<sup>13</sup>See also Fábregas (2013); Kramer (2015) for additional evidence that changes in declensional class and gender-marking involve renominalization.

## 5 Analysis

I propose that ‘count’ and ‘mass’ nouns differ along two critical dimensions, both of which are syntactically encoded: (i) is the nominal root individuated or not? (ii) is Number projected in the syntax? With respect to the first question, I propose that the presence of a feature [IND(IVIDUATED)] on the categorizer, the first syntactic node that an acategorial root adjoins to, is responsible for making discrete individuals as part of the extension of the root available. This feature is what will enable the root to enter a countable syntactic frame including enabling Number to project. It is in Number where [SG] and [PL] are merged (Ritter 1991).

In contrast, being ‘mass’ is better understood as the lack of count properties, in particular a Number projection hosting [SG/PL]. Despite their not having a Number projection, I will further show that mass nouns differ in whether or not they are marked for [IND]. That is, while unmarked mass nouns and plural mass nouns lack the [IND] feature, and thus discrete individuals that can be counted, object mass nouns will be specified as [IND]. This feature is, I propose, what they share in common with count nouns. Unlike count nouns, however, object mass nouns will not be singular or plural-marked because they do not project Number. Instead, they will consist of a feature that I call [COLL(ECTIVE)], following De Belder (2013); Alexiadou (2015); Lieber (2016). Such a feature will be spelled out as *-ery*, *-ment*, *-age*, *-ware* on a root-by-root basis and be located on an outer head that competes with Number to satisfy its selectional requirements.

In what follows, I spell out the pieces of theory in detail. Then, I move on to argue how the theory derives the morpho-syntactic asymmetries described and generalizations identified. When relevant, I will also show that the theory makes important predictions, which I argue are borne out.

### 5.1 Some ancillary assumptions

I am assuming a generative approach to syntax as outlined by Chomsky (1995, 2000, 2001, 2008) and subsequent work, in tandem with the Distributed Morphology model (Halle and Marantz 1993; Marantz 1997; Harley and Noyer 1998; Embick and Noyer 2001; Embick 2007, 2010, 2015; Embick and Marantz 2008; Bobaljik 2012; Harley 2014). Under DM, the terminal nodes provided and manipulated by the syntax are simply bundles of features. These features may be interpretable or uninterpretable features. The interpretable features will be notated as [F] and will have semantic import on the terminal that bears them. Uninterpretable features will be noted as [*u*F].*u*Fs can themselves be unvalued or inherently valued (Pesetsky and Torrego 2007): [*u*F:\_] ~ [*u*F: *val*].<sup>14</sup>

I further assume that all syntactic operations, including Merge and Move, are feature driven (Svenonius 1994; Adger 2003; Pesetsky and Torrego 2006; Heck and Müller 2007; Müller 2010; Folli and Harley 2020, a.o.). I will represent c-selectional requirements as [*•*F*•*] when relevant. Following Adger (2003, p.67), I assume that this c-selectional feature is checked under sisterhood: a feature [*•*F*•*] on a syntactic object Y is checked when Y is sister to another syntactic object Z which bears a matching feature *F*. A head with a selecting feature will project the label of the newly created node:  $\{\alpha[•\beta•], \beta\} \rightarrow \{\alpha, \{\alpha[•\beta•], \beta\}\}$ .

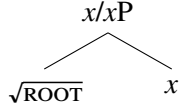
Following Chomsky (2000) and others, I will assume that there is an operation called Agree between a probe (with unvalued features) and a goal (with a feature that matches the probe’s). I further assume, as it has become standard in the literature on Agree, that it involves a two-step process (Benmamoun et al. 2009; Bhatt and Walkow 2013; Arregi and Nevins 2012; Smith 2021): (i) a matching operation establishing a

<sup>14</sup>The assumption that *u*Fs may be inherently valued is not crucial for the present analysis.

link between the probe and the goal; and (ii) a copying operation, according to which the values of  $F$  on the goal are copied onto the unvalued  $uF$  counterparts that have been previously matched. Features in the extended projection of the NP may appear on D-heads as a result of an Agree relation.

Lexical categories such as noun, verb, adjective etc. are decomposed into a category-neutral terminal, i.e. the  $\sqrt{\text{ROOT}}$ , and a category-determining head, e.g.  $n$ ,  $v$ ,  $a$ . These two terminals form a complex head the label of which is provided by the categorizer (Marantz 1997, 2001; Arad 2003; Levinson 2007, 2014; Embick 2010, 2015; Folli and Harley 2020). From now on, I will represent this complex head as in (52).

(52) Complex head:  $\sqrt{\text{ROOT}}$  + categorizer  $x$



After spell-out, at PF, the feature bundles on the terminals are mapped to an exponent via Vocabulary Insertion (VI) rules, which are subject to competition as mediated by the Subset Principle (Kiparsky 1973). Following the notation from Embick (2015), VI rules have the format in (53).

(53) VI rule format

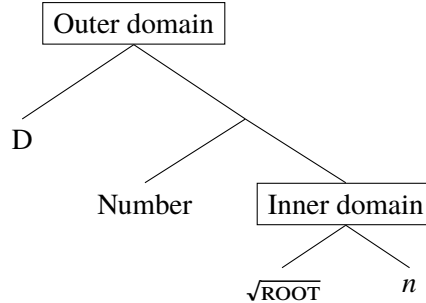
$\alpha[F] \Leftrightarrow X / \_\beta$  ‘Map  $F$  on  $\alpha$  to vocabulary item  $X$  in the context of  $\beta$ ’

$\alpha$  is the syntactic category of the terminal;  $[F]$  is the relevant feature or feature bundle on the terminal node;  $X$ , to the right of the bidirectional arrow, represents the phonological form, i.e. the exponent; and the slash ‘/’ indicates the context of application, which may be more or less specific (see Moskal 2015; Moskal and Smith 2016).

## 5.2 The active players: Individuation and number

It is generally assumed in DM-based approaches that there are two distinct domains for the computation of morphological and semantic processes: an “inner” domain and an “outer” domain. The former is tied to morphological and lexical irregularity or idiosyncrasies, and the latter is tied to morphological and semantic regularity (e.g. regular inflection). The working hypothesis in the literature is that the inner domain is located within the categorizing domain, i.e. categorizers and below including the root, whereas the outer domain is characterized by functional projections above  $nP$ , i.e. in the case of nominals Number, D or K, (Marantz 2001, 2013; Arad 2003; Embick 2010; Harley 2014; Wood 2016, 2023): Figure 1.

Figure 1: Inner vs. outer domains within nominals



I propose that a theory of the count-mass distinction must make reference to at least two types of features, whose syntactic and semantic contribution must differ: individuation and number. We can think

of the individuation feature as a sort of classificatory feature: when applied to a root, it will determine whether the root has discrete individuals or not, i.e. generally referred to as atoms in the semantic literature. In other words,  $n[\text{IND}]$  will impose an atomic structure on the root. Lack of this feature will result in an anti-atomic structure. I will refrain from the semantic details of what really counts as an atom, since discussing the semantics would take us too far afield of the paper’s goal. It is enough to say that  $n[\text{IND}]$  ensures a semi-lattice on the root that is closed under sum and generated from the set of atoms, i.e. a semi-lattice that has atoms as minimal parts (Bale and Barner 2009). We can simply state this as in (54), where ‘\*’ represents Link’s (1983) closure under sum operation.

- (54) if  $\text{atom}(x) = \{x: x \text{ is an atomic thing}\} = \{a, b, c\}$ , then  $^*\text{atom}(x) = \{x: x \text{ is an atomic thing or sum of atomic things}\} = \{a, b, c, ab, ac, bc, abc\}$

The opposite of an atomic semi-lattice is an anti-atomic one: it is also closed under sum and thus has a supremum, but it is not generated from the set of atoms and lacks minimal parts. See Bunt (1979); Gillon (1992); Wellwood (2019) for a definition.<sup>15</sup>

Given that this feature sorts the root into countable and non-countable classes, I propose that this feature must be located within the inner NP domain. In particular, building on insights from Bale and Barner (2009) and Smith (2021), I propose that the categorizing heads that roots occur with determines whether the nominalized root, i.e.  $\sqrt{\text{ROOT}} + n$ , is or not individuated. Thus, the categorizing  $ns$  that roots may combine with come into two “flavors”, illustrated in (55).

- (55) Countable vs. Non-countable  $n$
- a.  $n[\text{IND}(\text{INDIVIDUATED})]$
  - b.  $n$

One flavor of  $n$  is specified as  $[\text{IND}]$ , and the other flavor of  $n$  is underspecified. The role of  $[\text{IND}]$  on  $n$  is to perform individuation, understood as described above. That is, it will make available discrete, i.e. individually separable and distinct, elements that can be later on counted. In the absence of such a feature, the nominalized root will simply be underspecified for individuation and will lack separable discrete elements, disallowing counting. In a nutshell,  $[\text{IND}]$  makes the NP countable; lack of  $[\text{IND}]$  makes the NP non-countable.

The presence of the  $[\text{IND}]$  feature on  $n$  is conceptually justified. The countable-non-countable distinction is in many ways idiosyncratic, and generally considered a “lexical” property of roots (Soja et al. 1991; Chierchia 1994; Rips and Hespos 2019);  $[\text{IND}]$  is within the inner nominal domain identified in Figure 1, which is responsible for such idiosyncrasies. What is more, it is also not unreasonable to hypothesize that a root must first be individuated by introducing the relevant countable structure before the cardinality of the discrete individuals that are part of the extension of the root’s meaning can be determined, via number marking.

It is also empirically justified to separate plural-marking from individuation marking. For instance, determiners are not only sensitive to the noun being number-marked, but also to it being count; thus we need a feature making  $[\text{IND}]$  (in addition to Number) a possible goal for probes on determiners to enter an Agree relation with. Second, there are plural marked nouns like *dregs* in English or *babas* ‘drooling’ (lit. ‘drools’) that are nevertheless mass and non-countable. These facts are problematic for any theory in which plural-marking entails countability, as proposed by Borer (2005a) and Cowper and Hall (2009,

<sup>15</sup>Bale and Barner (2009, p.238) refer to an atomic semi-lattice as ‘individuated’ and to the anti-atomic one as ‘continuous’.



2012). Moreover, having this feature helps us establish the structural and formal parallel between object mass nouns (e.g. *jewelry*) and count nouns (e.g. *jewel*); namely, they both are both individuated, specified as [IND]. Despite this commonality, they must differ in some respect.

Besides [IND] on *n* making the basic countability distinction, I assume that there are two number features: [SG] for singular and [PL] for plural. The location of number features has been argued to vary across and within languages (Alexiadou 2004, 2015; Acquaviva 2008, 2016; Wiltschko 2008, 2021; Kramer 2016; Kouneli 2020), a view commonly referred to as ‘split number’: lexical or idiosyncratic plurals are located in the inner NP while regular plurals are located in the outer NP domain. Thus, building on the insights from the prior literature and some of the observations from the previous sections, I assume that number features, and specifically plural, might be located on two different syntactic positions: *n* and Number. The former will be the source of lexical and idiosyncratic plurality and need not depend on the *n* being [IND]. This is for example the source of plural-marking on mass nouns, a point already made by Alexiadou (2004, 2015); Harbour (2009); Kouneli (2019). In contrast, I assume that the latter head, i.e. Number, which is above *n* and below D (Ritter 1991; Cowper 2005; Harbour 2011; Toquero-Pérez 2023, 2024), is the source of regular singular/plural-marking. This head, I propose, requires complementation by an *n*P specified as [IND]. I encode this with the feature [ $\bullet$ IND $\bullet$ ] on the Number head. Despite the differing location, I assume that the meaning of Number features is uniform: [SG] maps a noun to a singularity, i.e. a singleton set; [PL] maps the noun to a plurality, i.e. non-singletons or sums.

Last but not least, I propose that we need an additional feature that is different from [SG/PL] and is involved in the structure of object mass nouns. I call this feature [COLL(ECTIVE)]. Corbett (2000) uses the label ‘collective’ to refer to nouns denoting a group whose members are conceived of as a unit. He goes on to point out that the members of the collection share something in common, what Corbett 2000, p.141 refers to as ‘the cohesion of a group’. This is intuitively accurate for the case of object mass nouns as I pointed out on page X, when describing what it meant for something to qualify as ‘jewelry’ or ‘foot-ware’.<sup>16</sup> Given the ‘derivational’ nature of object mass nouns and the observation that these morphemes have nominalizing properties in the languages discussed, I propose to located this feature on a *n* head. However, just like Number, I take *n*[COLL] to require complementation by an *n*P specified as [IND]: [ $\bullet$ IND $\bullet$ ]. Semantically, this feature creates a plurality of sorts, described as in (56).

- (56) [COLL]: when given an individuated item  $\alpha$ , it creates a collection of items  $\beta$  which stand in a relation with  $\alpha$ .<sup>17</sup>

In a nutshell, we can summarize the pieces of the proposed theory as follows:

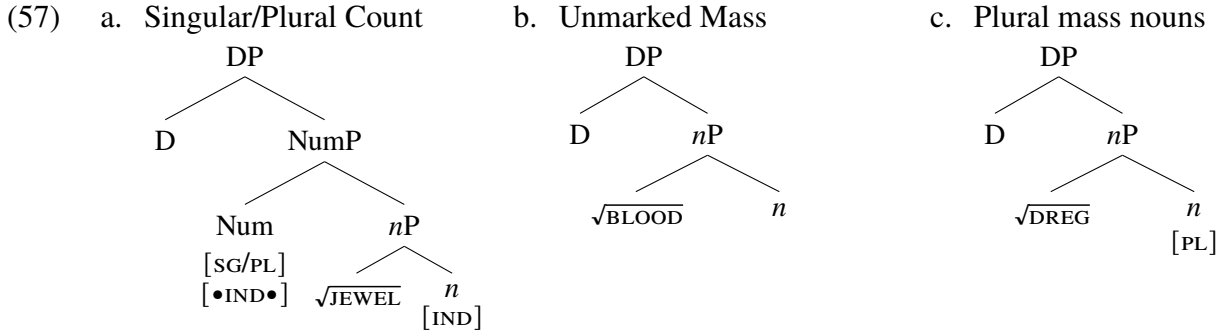
- Count NPs are marked for [IND] and [SG/PL] (i.e. Number).
- Mass NPs lack Number.
- The class of object mass nouns shares (i) with count NPs markedness for [IND]; and (ii) with mass NPs lack of Number.
- Object mass nouns differ from both in being [COLL]-marked. [COLL] creates collections of individuated items that share some cohesion relation.
- Both *n*[COLL] and Number select for an [IND]-marked complement.

<sup>16</sup>See also footnote 12.

<sup>17</sup>Note that the meaning of this feature is not too different from what Tomioka (2021) proposes for associative plurals.

### 5.3 Setting the baseline: count vs. unmarked and [PL]-marked nouns

Before diving into object mass nouns, and with the aim of establishing a proper baseline for comparison, it is first necessary to discuss count nouns, as well as unmarked and plural mass nouns. Count and mass nouns differed in their availability to have singular-plural contrasts. I propose that this difference falls out from the fact that count nouns always project NumP while mass nouns never do. This is in line with previous proposals such as Borer (2005a); Cowper and Hall (2009, 2012); Harbour (2007, 2011); Mathieu and Dali (2021) among others for which mass nouns are syntactically more impoverished than count nouns. The basic structure of count and unmarked and plural-marked mass nouns is thus as in (57).



Count nouns have the structure in (57a). The root adjoins to a categorizing  $n$  that is specified as [IND]. This will introduce discrete individuals in the extension of the noun root. Number requires complementation by [IND], as indicated by the bullet feature, which is satisfied upon merger. Number then projects on top of  $nP$ . This ensures obligatory number marking in count nouns in languages like Spanish or English. Depending on the feature specification on Num, the noun will be marked singular, e.g. [SG], or plural, e.g. [PL].

The syntax of unmarked mass nouns in (57b) is different from that of count nouns in (57a) in two respects. First, the  $n$  is underspecified for individuation, which entails that no discrete individuals are introduced. Second, mass nouns lack NumP; and, as a result they cannot be overtly pluralized and maintain their mass interpretation. We can attribute the failure to pluralize to the c-selectional requirement on Number: merger of Number on top of the underspecified  $n$  will not satisfy Number's c-selectional requirement. Likewise, plural mass nouns in (57c) are neither [IND] nor Number-marked. The source of [PL]-marking is the nominalizer itself (Alexiadou 2004, 2011; Acquaviva 2008; Kouneli 2019).<sup>18</sup>

We can attribute modification by certain elements such as numerals and size/shape adjective to the presence of the additional syntactic structure in count NPs: NumP enabled by  $n$ [IND]. If we look at word

<sup>18</sup>Support for the low position of [PL] with these nouns can be found in noun-noun compounds where only the head of the compound can be inflected for number, a restriction that has been attributed to the fact that the non-head noun may be as large as an  $nP$ , but it does not include NumP (Wiltschko 2008; Harley 2009): (iv)-(v).

- (iv) a. street dog(-s)    b.\* street-s dog(-s).  
 (v) a. perro(-s) policía    b.\* perro(-s) policía-s  
       dog-PL    police        dog-PL    police-PL  
       'police dog(s)'

When the noun-noun compound has a plural mass noun as a non-head, plural-marking on the non-head survives: (vi)-(vii). This fact is predicted if [PL] on these plural mass nouns is not located on Number, but on  $n$ , as I am proposing here.

- (vi) a. dreg-s filter(-s)    b.\* dreg filter(-s)

order patterns, we observe the following: (i) size/shape adjectives precede classificatory adjectives, which are adjoined low in the structure (Alexiadou et al. 2007; Svenonius 2008); (ii) numerals precede both types of adjectives; and (iii) determiners, including possessors, must precede everything. This is shown in (58) for English.

(58) Word orders

- a.  $D > \# > \text{size/shape } A > \text{Classificatory } A > N$   
{The/ John's/ These} five big Spanish books.
- b.  $D > \# > \text{Classificatory } A > \text{size/shape } A > N$   
\* {The/ John's/ These} five Spanish big books.
- c.  $D > \text{Size/shape } A > \# > \text{Classificatory } A > N$   
\* {The/ John's/ These} big five Spanish books.
- d.  $\# > D > \text{size/shape } A > \text{Classificatory } A > N$   
\* Five {the/ John's/ these} big Spanish books.

The data in (58) illustrates that the only possible DP-internal word order when there are multiple modifiers and determiners (or D-like elements) must be as in (58a). In fact, any deviation from that order results in unacceptability. I take the strict order in (58a) to be the result of the structural height at which the different modifiers are introduced. Namely, classificatory adjectives must be introduced lower than size/shape adjectives, which must be introduced lower than numerals. Determiners, demonstratives and possessors occupy the highest part of the DP.

The situation in Spanish is very much the same, with the caveat that adjectives are generally postnominal while numerals are prenominal. Size/shape adjectives have to occur further away from the noun root than classificatory ones. The reversed order is unacceptable. These patterns are shown in (59).

(59) Word orders for Spanish

- a.  $D > \# > N > \text{Classificatory } A > \text{size/shape } A$   
Lo-s      cinco libro-s      españo-le-s grande-s  
the.M-PL five    book.M-PL Spanish-PL big-PL  
‘The five big Spanish books’
- b.  $D > \# > N > \text{size/shape } A > \text{Classificatory } A$   
\* Lo-s      cinco libro-s      grande-s españo-le-s  
the.M-PL five    book.M-PL big-PL    Spanish-PL  
‘The five Spanish big books’

While size/shape adjectives are generally postnominal, they may occur prenominal in which case they must always follow numerals, as in (60). Thus, the word order facts resemble those for English.

(60) a.  $D > \# > \text{size/shape } A > N > \text{Classificatory } A$

- (vii) a. niño(-s) baba-s      b.\* niño(-s) baba  
kid.M-PL drool-PL      kid.M-PL drool  
‘drooling boy’ (lit. ‘drools boy’, i.e. boy that has/does a lot of drooling)

Lo-s cinco grande-s libro-s españo-le-s  
the.M-PL five big-PL book.M-PL Spanish-PL  
‘The five major Spanish books’

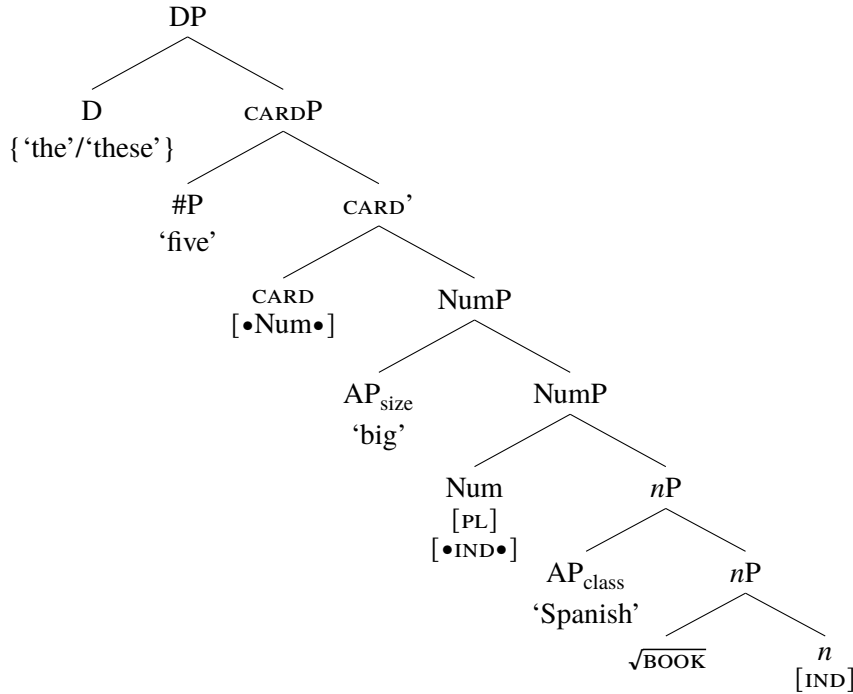
b.  $D > \text{size/shape } A > \# > N > \text{Classificatory } A$

\* Lo-s grande-s cinco libro-s españo-le-s  
the.M-PL big-PL five book.M-PL Spanish-PL  
‘The major five Spanish books’

I take these sets of facts as evidence for the following. Classificatory adjectives are adjoined to the domain of class, which is the lowest in the structure (Alexiadou et al. 2007; Svenonius 2008; Wiltschko 2014; Dékány 2021), i.e. *nP*. Given the interaction of size/shape adjectives with number-marking and individuation, I propose that these must be adjoined higher than the lowest *nP* dominating the root (Cinque 2005, 2010; Svenonius 2008; Deal 2017; Dékány 2021). In particular, when modifying count nouns, they are adjoined to NumP.

Numerals are introduced by their own functional head, which I label here as *CARD*(inality) after Scontras (2013). Finally, determiners and demonstratives are introduced as *D* heads, and possessives are located in *D*’s specifier position (Abney 1987; Corver 1990). The full DP structure for count nouns is in (61).<sup>19</sup>

(61) The articulated structure for count nouns



The syntax in (61) is consistent with analyses that have located numerals higher than Number but

<sup>19</sup>The surface word order in Spanish in (59) and (60) may be achieved via overt *n/nP* movement to a higher projection, as proposed by Cinque (2005, 2010), or by post-syntactic amalgamation in the spirit of Harizanov and Gribanova (2019). The choice of analysis is not relevant to the point being made in the paper. A third, less appealing, option would be to assume that the directionality of adjunction differs between English and Spanish.

lower than D, e.g. [Pancheva \(2022, 2023\)](#); [Cinque \(2023\)](#); [Toquero-Pérez \(2023, 2024\)](#).<sup>20</sup> What is more, given that numeral modification is restricted to the set of count nouns and what is crucial for these nouns is the projection of Number, I propose that the *CARD* head introducing numerals is sensitive to there being a NumP. This requirement is enforced by the selectional feature [ $\bullet$ Num $\bullet$ ] on the *CARD* head.

Focusing on size/shape adjectives, the structural representation is consistent with the hypothesis put forth by [Deal \(2016, 2017\)](#) that size/shape APs require the *nP* to be countable (i.e. have atoms and their sums in its extension) and also adjoin higher than the *nP* containing the root. For Deal, the countability requirement is encoded via a presupposition on the adjective's individual argument along the lines in (62).<sup>21</sup>

$$(62) \llbracket \text{big} \rrbracket = \lambda x: \exists x[P(x) \wedge *atom(x)]. \exists d[\text{big}(x) \geq d]$$

‘The property of being big to a degree larger than *d* satisfied if *x* is in *P* and it is an atom or sum of atoms’

As a result, we have a way of accounting for why size/shape adjectives are unacceptable with unmarked and plural mass nouns. These mass NPs are unmarked for individuation and are syntactically impoverished; thus, none of the requirements are met, and modification by this class of adjectives is precluded.

In addition, the hypothesis receives support from the observation that (some) size/shape adjectives cross-linguistically require the presence of overt classifiers, whose distribution is sometimes paralleled to that of Number ([Borer 2005a](#); [Cowper and Hall 2014](#)). Examples include Hungarian in (63) from or Teochew, Southern Min in (64).

(63) *Hungarian* ([Dékány 2021](#))

- |   |  |
|---|--|
| <p>a. két nagy szem alma<br/>two big CL<sub>eye</sub> apple<br/>‘two big apples’</p> <p>b. *két szem nagy alma<br/>two CL<sub>eye</sub> big apple<br/>Int. ‘two big apples’</p> | <p>c. két vekni meleg kenyér<br/>two CL<sub>loaf</sub> warm bread<br/>‘two warm loaves of bread’</p> <p>d. *két meleg vekni kenyér<br/>two warm CL<sub>loaf</sub> bread<br/>Int.: ‘two warm loaves of bread’</p> |
|---|--|

(64) *Teochew, Southern Min* (adapted from [Biggs and Zhuosi 2022](#))

- |  |  |
|--|--|
| <p>a. Hi sa go dua *(-go) gai tun<br/>that three CL big A.CL N.MOD candy<br/>‘those three big pieces of candy’</p> | <p>b. Hi sa go sio (*-go) gai tun<br/>that three CL hot A.CL N.MOD candy<br/>‘those three pieces of hot candy’</p> |
|--|--|

In Hungarian the dimensional adjectives, which are lower than numerals, must precede the classifier: (63a) vs. (63b). Non-dimensional attributive adjectives like *warm* must follow the classifier: (63c) vs.

<sup>20</sup>[Pancheva \(2022, 2023\)](#) argues based on evidence from Bulgarian that Number may be represented twice in the structure of the NP: a low Number head above *n* and below numerals, as originally proposed by [Ritter \(1991\)](#), and a higher Number head above numerals, in the spirit of [Sauerland \(2003\)](#).

<sup>21</sup>For [Deal \(2016, 2017\)](#), individuation is achieved via a covert functional head above *n* and below Number, where [PL] is merged and she assumes numerals are also adjoined. Deal’s proposal can be recasted in the terms of the current proposal: the covert head is *n*[IND]; size adjectives are adjoined higher, to the projection immediately c-commanding the covert atomizing constituent, i.e. her NumP; numerals are adjoined higher than NumP.

(63d). Similarly, in Teochew, Southern Min dimensional adjectives require the obligatory presence of the classifier following the adjective, e.g. (64a); but non-dimensional adjectives are ungrammatical with the classifier, e.g. (64b). Data like (63) and (64) strengthen the argument that there is a connection between NP structure and the modification by these adjectives. In a similar vein, Toquero-Pérez (2023, 2024) reports that countable unmarked number neutral nouns are incompatible with size/shape adjectives in Alasha Mongolian. In fact, the presence of the adjective signals a strict singular interpretation. Toquero-Pérez proposes that this is because number neutral nouns, though individuated satisfying the presuppositional requirement of the adjective in (62), lack NumP but [SG/PL]-marked nouns project it.

There is an additional welcome consequence of this structure regarding classificatory adjectives. These adjectives are acceptable with mass nouns. In fact, when more than one adjective of this class co-occurs, the order is not fixed, as shown in (65). These facts can be accounted for under the assumption that there are no ordering restrictions between adjuncts of the same XP (Alexiadou 1997; Cinque 1999), i.e. *nP* in this case.

- (65) a. Mineral sparkling water      Sparkling mineral water  
       b. Agua gasificada mineral      Agua mineral gasificada  
           water carbonated mineral      water mineral carbonated  
           ‘Carbonated mineral water’      ‘Mineral carbonated water’

This featural account can also derive the observations with respect to the determiners in (21)-(26). These determiners are sensitive to individuation as well as number features. While all of them have a [*uIND*:\_\_] feature probe, they differ in the granularity of the number feature probes: [*uSG*:\_\_], [*uPL*:\_\_] or [*uNum*:\_\_]. This is summarized in Table 3.

Table 3: Count Ds

Determiner type	<i>uF</i> on D	F on xNP
SG-CT D (e.g. <i>each, every, cada</i> )	[ <i>uSG</i> :__]	[SG]
	[ <i>uIND</i> :__]	[IND]
PL-CT D (e.g. <i>several, varios</i> )	[ <i>uPL</i> :__]	[PL]
	[ <i>uIND</i> :__]	[IND]
CT D (e.g. <i>which, algun(os)</i> )	[ <i>uNum</i> :__]	[SG]
	[ <i>uIND</i> :__]	[IND]

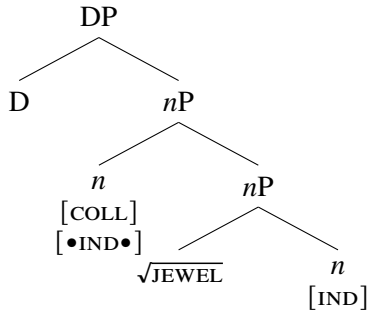
The distribution of the features on the D heads explains why none of these determiners are acceptable with (unmarked or plural) mass nouns: these nouns lack any of the relevant features for the probes on D to establish an Agree-link dependency with.

#### 5.4 The morpho-syntax of object mass nouns

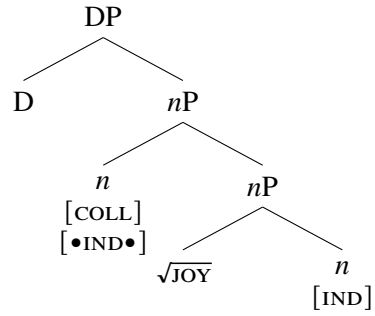
We are now in a position to address the situation of object mass nouns: in particular, the fact that they syntactically mass but share a number of properties with count nouns. I propose that the syntactic representation of object mass nouns is as in (66).



(66) a. English ‘jewelry’



b. Spanish ‘joyería’ (*jewelry*)



Looking at the structures in (66), it is clear to extract what these nouns share with the rest of mass nouns and with count nouns. As mass nouns, they lack Number. Like count nouns, however, they are [IND]-marked and not syntactically impoverished as the presence of the layered  $n$  suggests. The nested structure has  $n[\text{COLL}]$  immediately c-commanding  $n[\text{IND}]$ . That is, the terminal responsible for marking the noun as object mass properly contains the countable core:  $\sqrt{\text{ROOT}}-n[\text{IND}]$ . There is no labelling issue here because the selecting  $n$ -head projects.

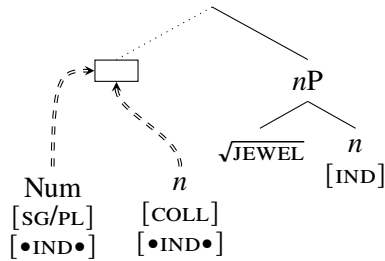
In addition, the structural position of this terminal node parallels that of Number: as shown in (61), Number immediately c-commands the  $n[\text{IND}]$  and therefore properly contains the countable core. As a result, just like Number can condition allomorphy on the root, so can  $n[\text{COLL}]$ , i.e. the locality conditions for allomorphy are the exact same. In terms of affix ordering, [SG/PL]-exponents follow the nominalized root (i.e. root and any class markers) and so do [COLL]-exponents as illustrated schematically in (67).

- (67) a.  $\sqrt{\text{ROOT}}-n[\text{IND}]$  -Number  
       arm   -a       - $\emptyset$        (*singular count*)  
       arm   -a       -s        (*plural count*)  
       ‘weapon(s)’  
   b.  $\sqrt{\text{ROOT}}-n[\text{IND}]$  - $n[\text{COLL}]$   
       arm   -a       -mento (*object mass*)  
       ‘weaponry’

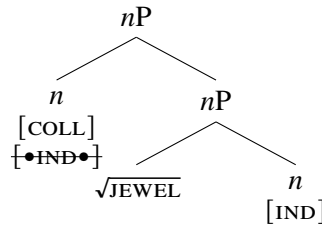
Moreover, just like Number, this [COLL]-bearing head comes equipped with the merge-triggering feature [•IND•]. This feature is a complementation feature and must be checked-off immediately via merger of  $n$ ’s complement. Given that both Number and  $n$  have the same complementation feature, which must be obligatorily checked-off by merging the relevant complement, we can account for the unacceptability of their co-occurrence: merger of  $n[\text{COLL}]$  will block merger of Number, and viceversa, thus accounting for their overlapping distribution. This competition for merger is illustrated in (68).

(68) Satisfying [ $\bullet$ IND $\bullet$ ]

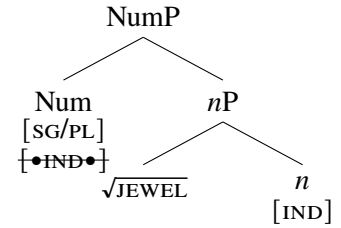
a. Competing for merger



b. Merger of  $n$ [COLL]

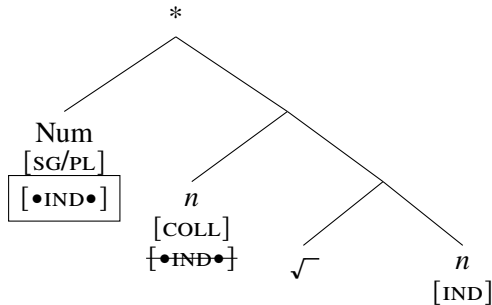


c. Merger of Number

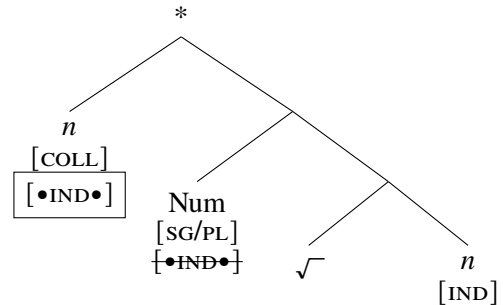


As illustrated in (68a), Number and  $n$  compete for merger. If  $n$  is merged as in (68b), it will write off its complementation feature and project  $n$ P, blocking merger of Number. The resulting vocabulary item is *jewelry*. If Number is merged instead, as in (68c), its complementation feature will be discharged and NumP will be projected; this will result in the insertion of vocabulary item *jewel(s)*. Attempting to iterate Number and  $n$  leads to a crash: only one of the two heads, i.e. the first-merged head, will be able to write its complementation feature off (Adger 2003; Heck and Müller 2007; Müller 2010). This is schematized in (69).

(69) a. Merge( $n, n$ ) > \*Merge(Num,  $n$ )

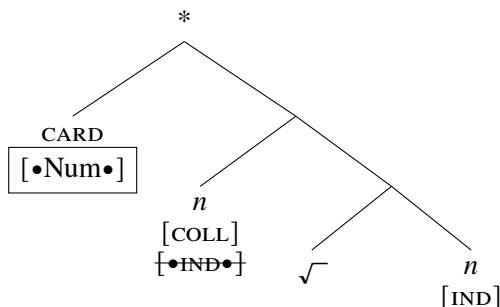


b. Merge(Num,  $n$ ) > \*Merge( $n, n$ )



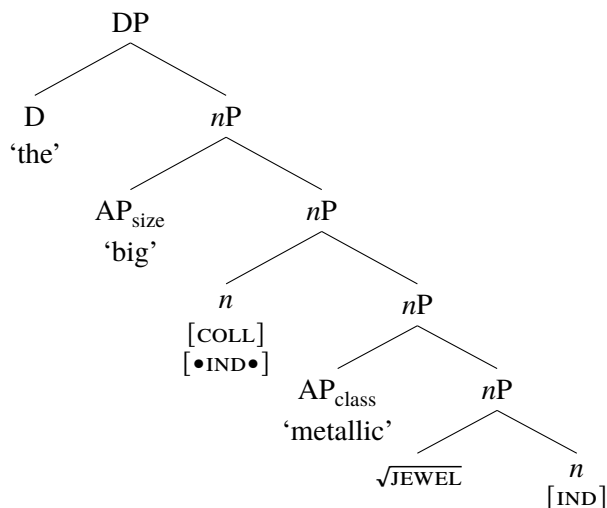
By virtue of not having a NumP, many of the distributional properties of this class of nouns as mass follow. For instance, the obvious one is no singular/plural contrast. Second, numeral modification is disallowed. This fact follows from the proposal that the CARD head that introduces numerals in its specifier requires complementation by Number. Since there is no Number in the structure, CARD cannot check off its [ $\bullet$ Num $\bullet$ ] feature under sister-hood, which leads to a derivational crash. This is schematized in (70).

(70) Merge( $n, n$ ) > \*Merge(CARD,  $n$ )



The situation with size/shape adjectives is different. My argument for why these adjectives were not allowed with the other subclasses of mass nouns relied on the syntactic make-up of these nouns. In particular, I argued, building on Deal (2016, 2017), that these adjectives required a higher attachment site and introduced a lexical requirement that the NP they modified had atomic reference. Neither of these were satisfied in the case of the other subclasses of mass nouns. However, object mass nouns differ from these in exactly these two respects. First, their structure is not syntactically impoverished. In fact, their structure requires this additional layered *nP* above the lower *nP* domain where classificatory adjectives are adjoined. That said and given the geometrical parallel between Number and this layered *n*, I propose that size/shape adjectives adjoin to the specifier of this outer *nP*. Second, these nouns are [IND]-marked, which enables the satisfaction of the lexical semantic requirement of the adjective, e.g. (62). The structure of object mass nouns with a size adjective modifier is in (71).

(71) *the big metallic jewelry*



The proposal that object mass terminal contains an individuated *nP* and has an overlapping distribution with Number has a series of welcome consequences, as I have shown here. One of these was capturing the fact that the root morphemes that participate in the class of object mass nouns also participate in the class of count nouns giving rise to the doublets given in §3.1. The structural representations are predicted by the containment hypothesis that I formulated.

As mentioned when discussing doublets, there is one potential trade-off of adopting this decompositional account that relies on a nesting structure for containment: not every object mass noun has a count noun counterpart. This was most clearly seen in English with the example of *furniture*, *equipment* and *cutlery*. However, which vocabulary items are missing can be a matter of idiosyncrasy across languages, rather than large-scale systemic patterns. For instance, Spanish does have a count vocabulary item for both *furniture* and *equipment*, in addition to their object mass counterpart: *mueble* and *equipo*, respectively. The question is then what licenses the root to occur in one context (the object mass) but not the other (the count one).

In more or less lexicalist approaches, this is easily captured by the assumption that object mass noun roots are listed as such in the lexicon: the root  $\sqrt{\text{FURNITURE}}$  is mapped to a vocabulary item *furniture* and there is no nominal root  $\sqrt{\text{FURN}}$  (Chierchia 1998; Bale and Barner 2009; Rothstein 2010). In DM-style approaches, like the one adopted here, “listedness” and root-specific conditions are instead grammatically determined (by the output of the syntax).

There are two potential reasons for why a root might not be licensed, i.e. paired up with the relevant terminal or sets of terminals (Harley and Noyer 1998, 1999, 2000; Acquaviva 2009; Harley 2014; Kramer 2015): a semantic condition, and a morpho-phonological one. The semantic condition entails that pairing up a root with a particular terminal leads to uninterpretability. In the case at hand, this would entail that a root like  $\sqrt{\text{FURN}}$  will lead to a semantic crash if it occurs in the environment in (72). The ‘ $\leftrightarrow$ ’ is meant to indicate the mapping from structure to interpretation.

(72)  $\sqrt{\text{FURN/EQUIP/CUT}} \leftrightarrow$  ‘no meaning’ /  $\_\_n[\text{IND}]$  ] Number[SG/PL] ]

What the rule in (72) amounts to saying is that English speakers cannot compose a count meaning for these expressions.<sup>22</sup> However, attributing these gaps to an inability to assign a certain meaning seems to miss the generalization that I have been attempting to capture all along: the representation, and by virtue of semantic compositionality, the meaning, of object mass nouns is built on the countable base of the noun.

Instead, I hypothesize that the reason why there are lexical gaps in the paradigm is morpho-phonological: the relevant root cannot be mapped to an exponent at the point of Vocabulary Insertion in a particular context. This entails that, in those cases where there is an object mass noun but no count noun counterpart, the root can only be licensed in a nominal context where  $n[\text{COLL}]$  is present. For instance, a root like  $\sqrt{\text{FURN}}$  may only be expounded in the contexts in (73).

(73) a.  $\sqrt{\text{FURN}} \Leftrightarrow \text{furnit}/\_\_n[\text{IND}] ] n[\text{COLL}] ]$  ‘furniture’  
 b.  $\sqrt{\text{FURN}} \Leftrightarrow \text{furnish}/\_\_v$  ‘furnish’

If the contexts in (73) are not met, no vocabulary item will be able to be inserted. As Kramer (2015, p.54) notes, this way of thinking is very much in line with the Subset Principle: Vocabulary Insertion cannot proceed if (i) the target contains features that are not present in the syntactic derivation or (ii) the target does not occur in the relevant context specified by the rule.<sup>23</sup> Regarding variation and “listedness”, given the idiosyncrasy of what is an acceptable root-categorizer pairing, we do not expect the licensing

<sup>22</sup>Being unable to attribute a countable interpretation to roots like  $\sqrt{\text{BLOOD}}$  in English can be a case of failure of root licensing at LF. For example, in English roots like  $\sqrt{\text{WATER}}$  can be licensed in an individuated and non-individuated context, whereas other roots like  $\sqrt{\text{BLOOD}}$  cannot. This is schematized in (viii) for English. In contrast, in Nez Perce and Yudja, both  $\sqrt{\text{WATER}}$  and  $\sqrt{\text{BLOOD}}$  can be licensed in either context (Lima 2014; Deal 2017).

(viii)	a.	Form	Syntax	Root meaning at LF	example
		$\text{water} \Leftrightarrow [\sqrt{\text{WATER}} n]$	$\leftrightarrow$	WATER-SUBSTANCE	‘some water’
		$\text{water} \Leftrightarrow [\sqrt{\text{WATER}} n[\text{IND}]]$	$\leftrightarrow$	WATER-UNIT	‘a water’
	b.	Form	Syntax	Root meaning at LF	example
		$\text{blood} \Leftrightarrow [\sqrt{\text{BLOOD}} n]$	$\leftrightarrow$	BLOOD-SUBSTANCE	‘some water’
		$\text{blood} \Leftrightarrow [\sqrt{\text{BLOOD}} n[\text{IND}]]$	$\leftrightarrow$	#	‘a blood’

<sup>23</sup>The rule in (73a) is what Moskal and Smith (2016) refer to as ‘Hyper-Contextual’ VI rule: it makes reference to multiple terminal nodes. One may wonder about the specificity of the rule and whether it is a conceptual and/or an empirical issue. I want to briefly comment here that it is not. First, any theory of allomorphy has to account for the observation that terminals like Number can trigger suppletion on the root despite ‘not being strictly local’. This can be cashed out by assuming a theory of cyclic spell-out (Chomsky 2000, 2001; Marantz 2001; Embick 2010): (a)  $n$  spells out its complement, if there is one, which does not include the root because roots are adjoined to  $n$  forming a complex head; (b) when a next cyclic head is merged (e.g. D or K if there is one within the DP, Matushansky 2005), its complement which includes the root,  $n$  and Number is spelled out; (c) the intervening terminal between the root and Number, in this case  $n$ , is a zero-morpheme and as a result Number can trigger allomorphy on the root. This is similar to what Embick (2010) proposes and it is schematically represented in (ix).

conditions on roots to be universal across languages but largely idiosyncratic. While a root-categorizer pair may be available in language A (e.g. Spanish *muble*), the same combination may not be available in language B (e.g. English). This accounts for the variation in the types of gaps we might observe.

Pushing the licensing condition to the post-syntax, and in particular to the operation of Vocabulary Insertion, entails that certain combinations of (i) nominalizing features, (ii) number features, and (iii) the  $\sqrt{\text{ROOT}}$  yield no vocabulary item resulting in a lexical gap.

## 6 Eventive object mass nouns and containment

I have shown how the the proposal derives the generalizations for object mass nouns regarding their structural complexity and the competition of the relevant terminal node with Number. I have concentrated solely on the ‘collective’ cases (Lieber 2004, 2016; Alexiadou 2015); that is, those whose meaning could be paraphrased as something like ‘a collection of X-related items’, X being a placeholder for the what the nominalized root denotes.

However, as I briefly noted when introducing the doublets, the same vocabulary item that picks out an object mass noun may be ambiguous between the collective interpretation discussed in detail and an eventive interpretation. Grimshaw (1990), and subsequent work building on it (Borer 2005b; Alexiadou and Grimshaw 2008; Alexiadou 2009; Alexiadou et al. 2010) argued at length that these object mass expressions are argument-taking nominalizations whose base is an atelic VP. Some data are given in the examples in (74) for English and in (75) for Spanish.

- (74) a. The {furnishing/lighting}(\*-s) of the room for hours bothered Max.  
 b. The {frequent/intentional} lighting \*(of the streets) for hours bothered the neighbors.  
 c. John’s company did more lighting of Christmas trees than Mary’s company did.  
CARDINALITY, #DURATION
- (75) a. { El alcantarillado/\* lo-s alcantarillado-s } del barrio durante horas  
 the.M sewerage the.M-PL sewerage-PL of.the neighborhood for hours  
 causó estragos.  
 caused havoc.PL  
 ‘The sewerage(\*-s) of the neighborhood for hours caused havoc’

- 
- (ix) a.  $\left[ \left[ \begin{array}{c} \text{[XP]} \\ \text{Cycle A} \end{array} \right] \begin{array}{c} \sqrt{\text{ROOT}} \ n \\ \text{Cycle B} \end{array} \right] \text{Number D}$   
 b.  $\sqrt{\text{GOOSE}} \ n \text{ Number}$  VI rules for the terminals in Cycle B  
 $\sqrt{\text{GOOSE}} \Leftrightarrow \text{geese}/\_\text{[PL]}$   
 $\sqrt{\text{GOOSE}} \Leftrightarrow \text{goose}$   
 $n \Leftrightarrow \emptyset$   
 $[\text{PL}] \Leftrightarrow \emptyset/\sqrt{\text{GOOSE}}\_\text{ }$

The alternative is Moskal and Smith’s (2016) who propose, in a nutshell, that allomorphy on the root can occur as long as it is triggered by the terminal that immediately c-commands the cyclic head: if *n* is such a head, Number has then access to the root, which they formulate via VI rules that are hyper-context-sensitive. Given that the location of Number and *n*[COLL] is structurally identical the same logic applies here. I do not intend to adjudicate between the two proposals here; what I hope to have shown is that the structural description for the licensing of certain roots is not only empirically justified but it can be formalized within current theories of allomorphy. Whether it is preferable to do it via Hyper-Contextual VI rules or cyclic approach plus zero-morph exponence (or pruning) is something that I leave open.

- b. El alcantarillado intencionado \*(del barrio) durante horas  
 the.M sewerage intentional of.the neighborhood for hours  
 ‘The intentional sewerage \*(of the neighborhood) for hours’
- c. Los romanos realizaron más alcantarillado de las ciudades que ninguna otra civilización  
 the romans realized more sewerage of the cities than no other civilization  
 ‘The Romans did more sewerage of the cities than any other civilization did.’

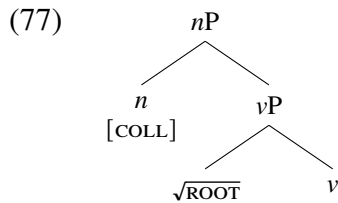
CARDINALITY, #VOLUME

As the English and Spanish data illustrate, these eventive object mass nouns are incompatible with overt plural marking, e.g. (74a) and (75a). Adjectival modifiers like *frequent* or *intentional* in (74a) and (75b) can target the eventive reading of the *-ing* or *-ado* expressions, which are reported to be grammatical only when their internal argument is overt.<sup>24</sup> Besides, when being compared, the interpretation that arises is a countable one, as opposed to a non-countable one in (74c) and (75c).

Some complex event nominals, which may be argument taking, may be number-marked. But this is typically so when the underlying VP is telic. For instance, this is illustrated with the examples in (76), *a* and *b* from Alexiadou et al. (2010, p.116).

- (76) a. The killing of the journalist(s)  
 b. The repeated killings of the unarmed civilians  
 c. There {were three killings/ was one killing} in the riots.  
 d. There were more killings in the 92 riots than in the 2020 ones. CARDINALITY, #DURATION

It is generally argued that these atelic eventive cases involve the nominalization of a previously formed *vP* constituent. In particular, leaving aside the details of the different implementations, what the proposals generally have in common is the idea that the object mass morpheme directly selects for the *v*-constituent as its sister. This is schematically represented in (77), where the object mass morpheme is what I have labeled as *n*[COLL] in this paper. I am omitting, but not neglecting, the possibility of there being additional verbal projections beside *v* (see Borer 2005b; Alexiadou and Grimshaw 2008; Alexiadou 2009; Alexiadou et al. 2010; Wood 2023, to name a few works).



The structure in (77) seems to pose a challenge to the generalization that object mass nouns are formed on top of countable bases, which may lead to the rejection of the containment hypothesis. However, I want to briefly entertain two possibilities that are consistent with the generalizations about collective object mass nouns and predicted by the containment hypothesis, but I do not intend to adjudicate between the two. In fact, languages might differ as to which option they instantiate. One possibility is to locate the individuated feature as part of the *vP* that is later nominalized along the lines of Alexiadou et al. (2010); the other is to postulate an additional *n*-head that first nominalizes the *vP* and makes it countable, and then becomes the complement of the object mass terminal.

<sup>24</sup>See Wood (2023, p.55) for more details.



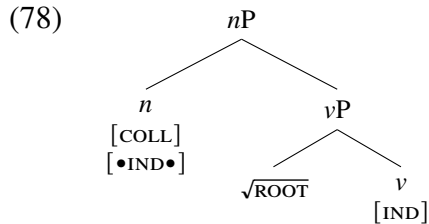
## 6.1 $v$ is [IND]

With respect to the first possibility, it has long been observed that there exists a parallelism between count/mass NPs and telic/atelic VPs (Mourelatos 1978; Bach 1986; Krifka 1989; Borer 2005a,b; van Geenhoven 2005; Wellwood et al. 2012). On the one hand, telic parallels count and atelic mass; on the other, number on NPs parallels grammatical aspect on VPs: perfective and progressive involve singular events whereas imperfective-habitual involves plural events. In addition, the grammatical properties of the NP/VP domain being measured affect the choice of dimension of measurement. These properties are summarized in Table 4, but see Wellwood et al. (2012) for more details.

Table 4: Dimensions of measurement by NP and VP type

Schwarzschild (2006): NP domain		Wellwood et al. (2012): VP domain	
Type of NP	Dimension of measurement	Type of VP	Dimension of measurement
unmarked mass	VOLUME, WEIGHT	atelic (homogenous)	DURATION, DISTANCE
object mass	CARDINALITY	atelic (non-homogenous)	CARDINALITY
PL-count	CARDINALITY	IMPF-telic	CARDINALITY
SG-count	*	PERF-telic	*

These facts are relevant for the eventive object mass cases. In particular, if object mass NPs parallel atelic non-homogeneous activities we would expect their underlying syntax to be rather similar. That is, just like *ns* can perform individuation, so may *vs*:  $\{v[\text{IND}], n[\text{IND}]\}$ . We can apply this line of reasoning to the nominalizations under discussion as well: the root is individuated by the  $v$ -head it adjoins to, and then the nominalizer selecting for  $[\bullet\text{IND}\bullet]$  is merged on top of it. This is represented with the updated structure in (78).



The structure in (78) is expected by the hypothesis that object mass nouns properly contain a countable base, i.e. a categorized root that is marked for individuation. In fact, the selectional properties of the  $n[\text{COLL}]$ -head are the same across the board (both for true collective cases and eventive ones): it requires that its complement be something marked for the feature  $[\bullet\text{IND}\bullet]$ . The mass properties, such as inability to be plural/singular marked and modification by numerals, follow because Number is not present. This possibility is very much in line with Alexiadou et al.'s (2010) proposal that deverbal argument-taking nominals of this type are marked [-count] and do not project NumP. In addition, it may shed some light on why predicates like those in (76) are marked for Number and behave as count nouns, given the overlapping distribution of [COLL] and [SG/PL].

A structure like the one in (78) receives independent support from Greek, where the verbalizer (e.g. *-o(n)*, *-i(z)*) and the nominalizer (e.g. *-m*, *-s*) are both marked overtly (Alexiadou 2011, 2015). The verbalizing morpheme is closer to the root than the nominalizing morpheme spelling out the collective feature. This is illustrated in (79).

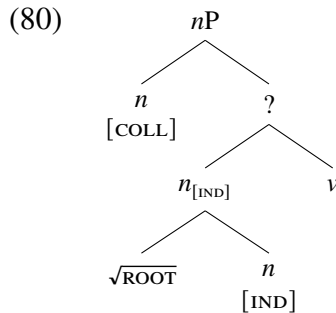
- (79) a. *epipl-on-o*,      *epipl-o-s-is*  
           *furn-VBZ-1SG*    *furn-VBZ-NMZ-GEN.FEM*  
           ‘to furnish, furniture’
- b. *end-i-o*,              *end-i-s-is*  
           *clothe-VBZ-1SG*   *clothe-VBZ-NMZ-GEN.FEM*  
           ‘to clothe, clothing’

(Alexiadou 2015, p.15)

## 6.2 Beyond (base-generated) nesting

So far we have only considered nesting as a possible instantiation of structural containment. However, Bobaljik (2012, p.57), and later on Dunbar and Wellwood (2016), note that there are alternative structures that satisfy containment and differ in the labeling of projections as well as the linear order of terminal nodes.

Suppose that the syntactic representation of these eventive object mass nouns does involve a countable core that is itself nominal. More specifically, the root is adjoined to an *n*-head, which is itself marked for individuation, as opposed to a *v*-head. The object mass morpheme would then enter the derivation in an outer layer. Suppose, then, that the base structure of eventive object mass nouns is as in (80), ignoring selectional features and the label of node dominating the lower *n* and *v* heads.



The root has adjoined to *n*[IND] creating a complex head which then merges with *v*. The *n*[COLL] is merged higher, as discussed so far. One piece of evidence for the idea that the *n* and not the *v* is responsible for the categorization of the root may be found in the following observation by Kiparsky (1982), translated into DM by Arad (2003) and Anagnostopoulou and Samioti (2014, p.100) from who this quote is taken: “root-based formations do not entail the existence of the corresponding nouns while noun derived ones do entail the existence of the corresponding nouns”. The English eventive cases under consideration seem to support the idea that the verbal meaning is noun derived. For instance, *to carpet* and *the carpeting (of the room)* entail there being a carpet (and presumably anything that the lexical semantics of the expression *carpet* entails). Likewise, *to light* and *the lighting (of the room)* entail there being lights.<sup>25</sup> In the case of Spanish too, the verb *to alcantarillar* ‘to lay sewers’ and the eventive object mass noun *el alcantarillado (del barrio)* ‘the sewerage of the neighborhood’ both entail the existence of sewers.

The question is whether this structure properly contains the countable base in the right way. I will show that there is a series of (independently motivated) assumptions that one could make, and that are compatible with the system developed here, which can lead to answering ‘yes’ to that question. Consequently, the analysis developed in the paper need not be changed.

<sup>25</sup>See however Borer (2014).

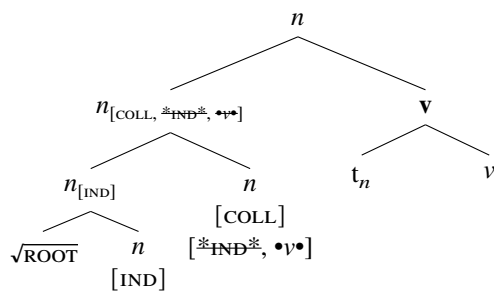
We can imagine that the operation of externally merging two heads as in (80) causes a labelling conflict (Chomsky 2013, 2015). Given the deverbal nature of the resulting expression, it seems intuitive to claim that  $v$  has to project. Under Chomsky’s proposal, there are two ways  $v$  could project: either via feature sharing (selection or Agree) or via the movement of the sister to a higher projection. I will assume that neither  $n$  nor  $v$  select for each other, which requires probing the latter labeling option.

To trigger movement, I will assume a slightly modified version of Adger’s (2003) system: movement is triggered when an EPP feature on the higher terminal is associated with a ‘strong’ feature in the sense of Chomsky (1995). In particular, a terminal bearing the feature  $[*F*]$  not only triggers complementation by the category headed by  $F$ , but also its (head) movement. In the case at hand,  $n[\text{COLL}]$  has the feature bundle in (81), where selectional features are ordered (Müller 2010).

(81)  $n[\text{COLL}, *IND*, \bullet v\bullet]$

The bundle in (81) consists of the interpretable feature  $[\text{COLL}]$ , the (head-)movement triggering feature  $[*IND*]$  and the selectional feature  $[\bullet v\bullet]$  to be discharged after  $[*IND*]$  has been checked off. The derivation of the noun proceeds as in (82).

(82) the derivation of eventive object mass nouns



In (82),  $n[\text{COLL}]$  triggers the head movement of the  $[\text{IND}]$ -marked  $n$ . After head movement onto  $n[\text{COLL}]$ , two things happen: the unlabelled node receives the label from  $v$ , and the  $[*IND*]$  feature on the hosting head is checked off (under sister-hood) with the moved constituent.  $n[\text{COLL}]$  then selects for  $v$ , thus discharging its second selectional feature and projecting  $n(\text{P})$ , posing no labeling conflict. This last step is the actual nominalization.

With respect to containment, the branching structure in (82) both is consistent with the Countable Base generalization and satisfies containment. The object mass morpheme is built on top of the countable base, composed of the root and the  $[\text{IND}]$ -marked categorizer. Thus, the representation entails that the object mass noun properly contains the countable root, and is not directly formed on the root.

While this syntactic structure could be instantiated by English and Spanish, it may not be available for Greek. This is so because of (i) the affix ordering facts in (79) and (ii) the observation that the verbalizers  $-o(n)$ ,  $-i(z)$  do not give rise to the entailment patterns reported for English (Anagnostopoulou and Samioti 2014). Therefore, we can hypothesize that languages might vary in the way that they build the structure for eventive object mass nouns: nesting as in (78) (e.g. Greek) or branching as in (82) (e.g. English/Spanish). This hypothesis receives support from the domain of comparatives where there are various ways, resembling the two alternatives here, of satisfying containment relations.

## 7 Cross-linguistic variation in the location of [COLL]

Some crucial aspects of the proposal included to disentangle individuation from number marking, and also [COLL] from [PL]. In addition, I motivated an analysis for English and Spanish, with additional reference to Greek, that locates [COLL] in an outer nominalizer taking an [IND]-marked complement. The location of [COLL] in a nominalizer is not meant to be a universal claim about the syntactic position of this feature. After all, features may appear distributed along different heads in the extended projection within a single language or across languages. In fact, this is the situation with [PL] which may appear on Number or *n* in English and Spanish, Amharic (Kramer 2016) or Greek (Alexiadou 2011, 2015; Kouneli 2019), but also on D in languages like Persian (Ghomeshi 2003). Thus, it would not be surprising to find [COLL] in a different syntactic position.

Given the similarities between [COLL] and [PL] on Number, it might be the case that [COLL] is located on the Number head giving rise to languages that have, potentially, [SG/ PL/ COLL] as part of their inventory of Number features. If that is the case, the theory I have developed in here makes the following predictions in (83) regarding this possibility.

- (83) If [COLL] is a Number feature,
- a. only countable bases will bear this feature; and,
  - b. [COLL]-marked nouns will enable numeral modification.

(83a) is expected under the containment hypothesis; and (83b) follows from the hypothesis that the head introducing numerals selects for Number. I will argue, based on data from Czech (Grimm and Docekal 2021), that the predictions are borne out.

Grimm and Docekal (2021) report that in Czech a morpheme *-í* can be affixed to countable nominal bases resulting in an interpretation that refers to a ‘collection of N’. The authors indicate that the morpheme *-í* has several allomorphs such as *-oví*, which, as far as they are aware, make no semantic difference. The authors gloss *-í*, and its allomorphs, as ‘í’ but I will gloss it as ‘COLL’ to indicate its collective contribution to the meaning of the noun.<sup>26</sup> The authors note that this morpheme is not very productive in the language and its distribution is restricted to a limited set of roots that appear in count noun contexts. In fact, in their footnote 5, they indicate the following: they surveyed 22 *-í*-marked nouns, which, the authors report, comprise the majority of *-í*-marked nouns in the language. Some singular count and collective-marked noun doublets from their sample are in (84).

- (84) a. *strom*,            *strom-oví*  
           tree.M.SG    tree-NT.COLL  
           ‘(a) tree, clump of trees’
- b. *list*,            *list-í*  
           leaf.M.SG    leaf-NT.COLL  
           ‘(a) leaf, foliage’

<sup>26</sup>I want to note the following: (i) Grimm and Docekal (2021) do not consistently gloss the gender on the *-í*-marked nouns; but according to Naughton (2005) nouns ending in *-i*, regardless of their countability, are generally neuter. See Grimm and Docekal (2021, p.92: ex.10b), included in this paper as (87). (ii) They do not always provide a complete morphological segmentation of the nouns and they do not always provide perfect minimal pairs. Based on their insights and those in Naughton’s (2005) grammar, the examples have been adapted to provide minimal pairs when possible.

- c. *cihla*, *cihl-oví*  
brick.F.SG brick-NT.COLL  
'(a) brick, brickwork'

All the unmarked count forms in (84) may be overtly marked plural with -y, regardless of whether they are masculine or feminine (Naughton 2005). This is shown in (85a). However, Grimm and Docekal (2021), and also Naughton (2005), indicate that if a noun is collective -*í*-marked then it cannot be subsequently plural-marked. This is illustrated in (85c).<sup>27</sup>

- (85) a. { strom/ list/ cihl}-y                      b. list-í-m                      c. \*list-í-mi  
       tree    leaf brick-PL                      leaf-NT.COLL-INSTR                      leaf-NT.COLL-INSTR.PL  
       'trees, leaves, bricks'                      'foliage'                      'foliages'

When the collective-marked noun has instrumental case, the plural allomorph *-mi* is ungrammatical in (85c). Instead, the unmarked instrumental case exponent must surface as in (85b). In this respect, the distribution of *-í* in Czech seems very similar to that of *-ery* or *-age* in English: it attaches to a countable noun stem and it is in complementary distribution with plural-marking. What is more, when describing the meaning of the *-í*-marked forms, they note the following: “the meanings of nouns derived by *-í* contrast strongly with ordinary plural meanings. [...] [T]he resultant meaning of nouns derived by *-í* is not simply a set of, for example, pine trees, but a set in which the members are coherently related” (Grimm and Docekal 2021, p.93). This semantic contribution resembles Corbett’s (2000) cohesion of a group which I claimed underlies the meaning of the feature [COLL].

The fact that only countable bases are compatible with this collective *-í*-marking is consistent with the prediction in (83a). However, it is not conclusive evidence that *-í* is spelling out a feature on Number as opposed to *n*. The crucial data come from complex numeral modification. Many Slavic languages, Czech included, have simple cardinal numerals, but also morphologically derived complex cardinal numerals, e.g. [Ionin and Matushansky \(2018\)](#). The latter are used to talk about kinds, groups and collections. See the contrast in (86) taken from [Grimm and Docekal \(2021, p.94: ex.15\)](#).

- (86) a. tři námoříc-i  
three sailor-NOM.PL  
'three sailors' simple cardinal numeral
- b. troj-ice námořík-ů  
three-GROUP sailor-GEN.PL  
'a group of three sailors' complex cardinal numeral for groups

Simple cardinal numerals like *tři* ‘three’ in (86a) are morphologically unmarked and, in the case of numerals 1-4, the NP they modify is nominative and plural-marked. When the numeral is morphologically

<sup>27</sup>The plural instrumental allomorph of masculine nouns is syncretic with the nominative plural -y. Only for some feminine or neuter nouns, the plural instrumental is -mi, see (x), (b-c) from Naughton (2005):

- (x) a. list, list-y  
leaf.M.SG.NOM leaf-M.PL(.NOM/INSTR)
- b. žena, žen-y, žen-ami  
woman.F.SG.NOM woman-F.NOM.PL woman-F.INSTR.PL
- c. umění, umění-mi  
art.NT.SG art.NT-INSTR.PL

marked with *-ice* as in (86b), (i) the NP is genitive and plural-marked, and (ii) the numeral root shows suppletion. Besides, complex cardinal numerals marked with *-ice* give rise to a group interpretation: ‘a group of *n*-number of sailors’.

Simple cardinals are ungrammatical as modifiers of *-í*-marked nouns, as (87) shows. However, Czech has another complex cardinal numeral which is marked *-oje* (for numerals 2-3) and *-ery* (for numerals above 3) and it translates as ‘2/3/4...collections’. We can call this numeral ‘collective cardinal’ and I gloss it as such (COLL.CARD). Crucially, collective cardinal numerals are grammatical with *-í*-marked nouns, but ungrammatical with plural-marked nouns such as *listy* ‘leaves’ as shown in (88), adapted from Grimm and Docekal (2021).<sup>28</sup>

- |   |  |
|---|--|
| <p>(87) a. dva list-y<br/>two.M leaf-M.PL<br/>‘two leaves’</p> <p>b. *dvě list-í<br/>two.NT leaf-NT.COLL<br/>Lit.: ‘two foliages’</p> | <p>(88) a. ?? dv-oje list-y<br/>two-COLL.CARD leaf-PL<br/>‘two sets of leaves’</p> <p>b. dv-oje list-í<br/>two-COLL.CARD foliage-NT.COLL<br/>‘two sets of foliage’</p> |
|---|--|

As the datapoint in (88b) illustrates, an *-í*-marked noun such as *listí* ‘foliage’ can be directly modified by a collective cardinal *dvoje* ‘two (collective)’. This fact is what makes this subclass of nouns in Czech different from object mass nouns in English and Spanish. Under the proposal advanced in this paper, direct numeral modification is only possible if Number has been projected: CARD introducing numerals in its specifier bears a feature [•Number•]. The fact that *-í*-marked nouns in Czech can be directly modified by a numeral, in addition to their being formed on top of countable bases, is therefore evidence that the [COLL] feature responsible for generating the ‘collection’ interpretation is located on Number, as schematized in (89a).

- (89) a.  $[_{\text{CARDP}} [\#_{[\text{uAGR:COLL}]}] [_{\text{CARD}} \text{CARD}[\bullet\text{Num}\bullet] [_{\text{NumP}} \text{Num}_{[\text{COLL}, \bullet\text{IND}\bullet]} [_{nP} n_{[\text{IND}]} \sqrt{\text{LEAF}}]]]$  = (88b)
- b.  $[_{\text{CARDP}} [\#_{[\text{uAGR:PL}]}] [_{\text{CARD}} \text{CARD}[\bullet\text{Num}\bullet] [_{\text{NumP}} \text{Num}_{[\text{PL}, \bullet\text{IND}\bullet]} [_{nP} n_{[\text{IND}, \text{M}]} \sqrt{\text{LEAF}}]]]$  = (87a)

[COLL] is spelled out as *-í*, and it surfaces on the noun, underspecified for gender (i.e. neuter). *-oje* on the numeral can be analyzed as the result of nominal concord between the numeral and the [COLL] feature on Number (Norris 2014; Ionin and Matushansky 2018). Plural-marked count nouns have a similar underlying structure but differ in the set of features that they bear on Number, e.g. (89b); as a result, a plural morpheme is exponed on the noun and no *-oje* surfaces on the numeral. In addition, the *n* bears a masculine gender feature, i.e. M.

If we were to locate the feature on a layered *n* instead, as we did for English and Spanish, we would account for the complementary distribution of [COLL] and [PL] but we would be left with no explanation

<sup>28</sup>As Grimm and Docekal (2021, p.97) put it: “In the case of nouns derived by *-í*, native speakers always prefer the use of the complex numeral over the simple cardinal numeral”. They go on to further indicate that “applying *-oje* to nouns other than those denoting entities which are sets of individuals that typically come in groups or are connected to one another in some manner typically result in infelicities”, e.g. (xi).

- (xi) ?? dv-oje stol-y  
two-COLL.CARD table-PL  
‘two sets of tables’



as to why numerals can modify [COLL]-marked nouns in Czech but not in English or Spanish. That said, we can conclude that the location of the [COLL] feature is subject to variation, just like [PL] is (Wiltchko 2021, for an overview): in some languages, it will be located on *n*, while in others it will be located on Number. This is how we account for the variation between Czech and English/Spanish summarized in Table 5.

Table 5: Variation in the distribution of [COLL] (and [PL])

	[PL]		[COLL]	
	<i>n</i>	Number	<i>n</i>	Number
<i>English</i>	✓	✓	✓	*
<i>Spanish</i>	✓	✓	✓	*
<i>Czech</i>	–	✓	*	✓

## 8 Ruling out alternatives

The count-mass distinction and its relation to countability has been the object of study of several theories of morpho-syntax. This section is meant to briefly review some influential proposals and how many of the empirical observations and generalizations discussed here pose non-trivial challenges for them. In particular, I will concentrate on three families of syntactic approaches within the traditional view: (i) the no Number approaches in Borer (2005a) and Cowper and Hall (2009, 2012), (ii) the feature-markedness approach in Cowper and Hall (2014) and (iii) the hybrid approach in Smith (2021).

**#1: the no Number approaches.** An influential proposal is found in Borer (2005a) who argues that (a) nominal roots denote undivided matter (i.e. they have a non-countable denotation) and (b) in the absence of a dedicated functional head that performs division of such matter, her Div(ision), the NP will have a mass syntax and semantics. This is schematized in (90).

- (90) a.  $[_{DP} D [_{\#P} \# [_{DivP} Div [_{NP} N ]]]]$  = count  
b.  $[_{DP} D [_{\#P} \# [_{NP} N ]]]$  = mass

For Borer, Div is realized by plural-markers in languages like English or classifiers in languages like Chinese. Singular number, sometimes realized as the indefinite determiner *a*, as well as numerals and quantity adjectives like *much*, *many*, *more* etc. are structurally above Div, in what she labels # (for Quantity). Semantically, Div imposes minimal parts that are themselves non-divisive (Cheng 1973) and constitute the basis for counting. That is, Div has the same semantic effect that [IND] in this paper does. Having Div is responsible for making NPs have a plural count syntax but also for making NPs (semantically) countable. In this respect, the proposals do not differ much.

It is unclear, however, how object mass nouns raise a contradiction for Borer’s system: on the one hand, they are mass and must thus lack Div; on the other, like plural count nouns, they are countable which means they must have Div. A series of other challenges arise if Div is the locus of plural-marking, which differs from the locus of singular-marking. First, we predict that a PL-marked noun may be subsequently singularized. This would be number system where a noun is overly marked for plural but triggers singular

agreement and having a strictly singular interpretation. [Toquero-Pérez \(2024\)](#) argues that such system is yet to be attested in the world's languages. What is more, [Harbour \(2007, 2011\)](#), following [Ritter \(1991\)](#), makes the case that there is no difference with respect to the location of Number features in count nouns. Last but not least, amalgamating plural and individuation is problematic for plural mass nouns as well: if plural-marking is a divider, why do these NPs have a mass syntax and are also non-countable.

A slightly different version from Borer, but built on similar insights, is found in a series of papers by [Cowper and Hall \(2009, 2012\)](#). They propose a theory of Number-marking that can account for the count-mass distinction. Like Borer, the crucial difference between count and mass NPs is the presence or absence of structure. In their case, the key syntactic piece is a Number head. Mass NPs lack Number while count NPs project Number. They propose a feature geometry according to which plural, i.e. [ $> 1$ ], is contained by what they call an individuator, i.e. [#]. Schematically, this looks like (91), where the ':' on the feature bundle indicates 'contained by'.

- (91) a.  $[_{DP} D [_{NumberP} \text{[#]} [_{NP} N ]]]$  = singular count  
 b.  $[_{DP} D [_{NumberP} \text{[#: } > 1] [_{NP} N ]]]$  = plural count  
 c.  $[_{DP} D [_{NP} N ]]$  = mass  
 d.  $[_{DP} D [_{NP} \text{[#]} N ]]$  = object mass

The individuating feature [#] in (91a) and (91b) acts as [Borer's \(2005a\)](#) divider and it is additionally in charge of singular-marking. Unlike Borer, plural itself does not perform division, but requires the NP to be already individuated. They briefly address the situation of *furniture* by speculating that these nouns have the structure in (91d) where [#] is a modifier of the N node (in the spirit of [Wiltschko 2008](#)). This approach also falls under the umbrella of the 'traditional approach' where object mass nouns are lexically individuated via a low number feature.

If this were the case for object mass nouns, however, we would still need to find an explanation for why Number and the object mass terminal are in overlapping distribution. As far as I know, the presence or absence of a modifier does not preclude the merger of a higher head. In addition, we would miss the generalization about the classes of roots that participate in both object mass and count nouns. The proposal suffers from similar issues as Borer's including the following: in what ways are countable NPs a natural class? And if plural-marking is dependent on the NP being count, e.g. (91a), how do we explain plural mass NPs? Relatedly, determiners are only expected to be sensitive to number-marking when the noun is count. However, demonstratives in English and definite determiners in Spanish show plural agreement when the noun is plural-marked regardless of the count-mass distinction.

**#2: feature-markedness approach.** [Cowper and Hall \(2014\)](#) propose a revised version of their earlier proposal. In their new system, singular count NPs are the most featurally unmarked NPs (i.e. unspecified for any number feature), while mass and plural count NPs form a natural class: they are both [Non-Atomic]. According to [Cowper and Hall \(2014, p.69\)](#), if a nominal lacks the feature [Non-Atomic] "it will be interpreted as atomic (i.e. contrastively *not* Non-Atomic) and thus as both count and singular". To further distinguish between mass NPs and plural count NPs they propose that the latter are also marked for a feature [Discrete]. The bundle [Non-Atomic: Discrete] spells-out plural -s. A schematic representation of the feature distribution is in (92) from [Cowper and Hall \(2014, p.69, ex: 10\)](#).

(92)

- |                        |                         |   |
|------------------------|-------------------------|---|
| a. Singular Count<br>Ø | b. Mass<br>[Non-Atomic] | c. Plural Count<br>[Non-Atomic: Discrete] |
|------------------------|-------------------------|---|

[Non-Atomic] is in charge of introducing the property of cumulativity, something that both mass and plural count NPs share (Cheng 1973; Krifka 1989), and [Discrete] makes sure that the NP has separable individuals (i.e. atoms) that can be counted. While the bundling of mass and plural count nouns as a natural class is empirically justified, this is likely a semantic natural class (Deal 2016, 2017): there is no feature that mass nouns and plural count nouns share to the exclusion of singular count nouns. This new proposal does not solve either puzzle mentioned above. In the case of object mass nouns, they speculate that these NPs are lexically specified for [Non-Atomic], in a similar vein as their previous proposal. However, given that these NPs are countable, they must also be specified as [Discrete]. In that case, there would be nothing that distinguishes these nouns from plural count nouns. This prediction is not supported. With respect to plural mass nouns, they spell-out *-s* which in their system is the bundle [Non-Atomic: Discrete], and yet unlike plural count nouns they uncountable and cannot occur with determiners like *several*.

We should note as well that this approach suffers from the possible types of determiners one might encounter cross-linguistically. As illustrated in this paper, there are determiners that select for singular count nouns (e.g. *every, each, cada*), and there are determiners that select for count nouns, both singular and plural (e.g. *which, algún(os)*). Under the approach by Cowper and Hall (2014), singular count NPs are featurally unmarked, which makes it impossible for a probe on D to enter an Agree-dependency with a potential goal. Second, singular and plural count nouns do not form a natural class; as a result, no determiner should be able to occur with the same count NP that is singular or plural-marked. Third, there is no mass-only determiner (see Chierchia 1998; Doetjes 2021), which this account fails to predict; in fact, it predicts there must exist such a determiner class by virtue of these NPs being [Non-Atomic].

**#3: the hybrid approach.** Unlike the other two approaches that conflate Number-marking and Individuation-marking, Smith (2021) proposes a separation of the two. Building on insights from Borer (2005a) individuation is taken to be the presence of a binary feature [ $\pm$ division]. Unlike Borer, and like Bale and Barner (2009), this feature is specified in the nominalizer that the acategorial root combines with. Count nouns have the structure in (93a) and mass nouns the one in (93b). Note that they only differ in the feature specification of the nominalizer, but they both project Number which may contain interpretable or uninterpretable features.

- |      |    |   |                         |
|------|----|---|-------------------------|
| (93) | a. | [ <sub>DP</sub> D [ <sub>NumberP</sub> Number[SG/PL] [ <sub>nP</sub> n[+div] $\sqrt{\text{BOOK}}$ ]]] | = singular/plural count |
|      | b. | [ <sub>DP</sub> D [ <sub>NumberP</sub> Number[Ø/PL] [ <sub>nP</sub> n[-div] $\sqrt{\text{BLOOD}}$ ]]] | = mass                  |

The representation of object mass nouns that Smith proposes is as in (94). As it can be observed, it differs from (93b) in several major respects: the nominalizer that the roots  $\sqrt{\text{FURNITURE}}$ ,  $\sqrt{\text{JEWELRY}}$  or  $\sqrt{\text{EQUIPMENT}}$  combine with is [+div]; the nominalizer also bears an interpretable [*i*PL] feature which has no PF correlate at the point of VI; and Number is not part of the structure.

- |      |   |               |
|------|---|---------------|
| (94) | [ <sub>DP</sub> D [ <sub>nP</sub> n[+div, <i>i</i> PL] $\sqrt{\text{FURNITURE}}$ ]] | = object mass |
|------|---|---------------|

Smith's proposal is insightful in that it explicitly divides the labor between individuation and number-marking. One of the welcome consequences of separating Number from individuation is the ability to capture the fact that object mass nouns and count nouns are members of the the natural class of countable

things. Besides, the proposal could easily accommodate the generalization about countable bases that I have formulated here to predict the existence of doublets.

However, it suffers from non-trivial challenges as well. First, with respect to object mass nouns, while the [+div] nominalizer is responsible for ensuring a countable interpretation on the root, there is no empirical motivation for the postulation of the interpretable low plural feature. In fact, Smith assumes that the interpretable low plural feature is both syntactically inactive for the purposes of agreement, which is why these nouns never control plural agreement DP-internally or externally, but also semantically unmarked, i.e. an identity function, in the sense of Sauerland (2003); Bale et al. (2011). In other words, there is nothing interpretable about it.

The proposal does not derive the overlapping distribution of object mass-marking and plural-marking either. The account needs to stipulate that Number cannot occur with nominalized elements (i.e. lexical items) that are inherently marked for number. Since the root in (94) is inherently number marked via the [iPL] on *n*, the Number head cannot be part of the derivation. Relatedly, there exists a containment relation between count nouns and the countable base, but there is no containment relation between object mass nouns and the countable base.

More generally, the prospect of mass nouns projecting Number obscures the possibility of establishing different natural classes in the domain of count and mass nouns. The class of count nouns is composed of [+div]-marked and Number-marked NPs, but there is no natural class that can be established for all subtypes of mass nouns: some may be [-div]-marked but Number-marked (unmarked mass and plural mass), whereas others may be [+div]-marked and have no Number (i.e. object mass nouns). Not only is this descriptively inadequate, but also explanatorily so because we cannot define or restrict the count-mass distinction in the syntax, and how it relates to the countable-no-countable distinction.

In contrast, a more attractive and adequate way of defining all these classes is as entailed by the current proposal: what all count nouns share is projecting Number (which is enabled by the individuated categorized root); and what all mass nouns share is the lack of Number, regardless of the individuated properties of the root. Individuation, irrespective of Number, then leads to the prospect of establishing further natural classes: object mass nouns and count nouns to the exclusion of the rest.

## 9 Broader implications: nominal architecture, countability and variation

The core of this paper has been concerned with object mass nouns and how they fit the different natural classes instantiated by the count-mass distinction and the countable-non-countable distinction. The challenge of these nouns is twofold: how can we ensure a mass syntactic representation? and at the same, what makes them form a natural class with count nouns? A possibility is that these nouns have a lexically count entry but enter a mass syntax frame, barring any count properties. However, I have argued at length that there is nothing lexically special about this subclass of nouns, and that instead their intersective properties with both mass and count are determined by the syntax. I have then outlined a theory of the count-mass distinction that accounts for the object of study as well as the other subclasses of nouns.

I started by motivating the generalization that count nouns and object mass nouns share a countable base on the basis of the availability of doublets. Either Number or the object mass morpheme may attach to such base, leading to the conclusion that these terminals are in overlapping distribution. I proposed that the representation of object mass nouns properly contains a countable base. This hypothesis can, by extension, be applied to count nouns. This entails that just like in the case of count nouns, [SG/PL] cannot merge directly with the root terminal, neither can [COLL] responsible for deriving object mass nouns. This containment relation could be satisfied via a base generated nesting structure or a derived nesting one, as

in the case of eventive object mass nouns. What is more, they may be variation as to whether languages make one or the other structure available.

While overlapping in their distribution, I made the case that [COLL] and [SG/PL] features may be located on different terminals (across languages): the former is hosted in a nominalizer in English and Spanish (and also Greek, [Alexiadou 2011, 2015](#)), the latter are on Number (for count nouns). The two terminals are, however, in competition for merger with each other to satisfy their complementation feature, i.e. [IND]. We can then conclude that the determining property for a noun to be count is markedness for Number. What all subclasses of mass nouns share is the fact that they do not project Number.

This novel analysis does not only account for many of the distributional properties between mass nouns and count nouns, but it is particularly insightful for the object mass-count distinction. It accounts for their similarities (e.g. many doublets, the possibility of root-allomorphy, and the enabling of adjectival modification across both classes) while accounting for the differences (e.g. the lack of overt plural-marking and ungrammaticality with numerals for object mass nouns). Besides, lacking Number but being [IND]-marked ensures that the noun has discrete separable units in its extension. It is this property that makes object mass nouns and count nouns form a natural class with respect to countability, i.e. the property of being counted or measured along a cardinality scale. Thus, I propose the following hypothesis in (95).

(95) **The Countability Hypothesis**

Being countable means being marked for individuation in the syntax.

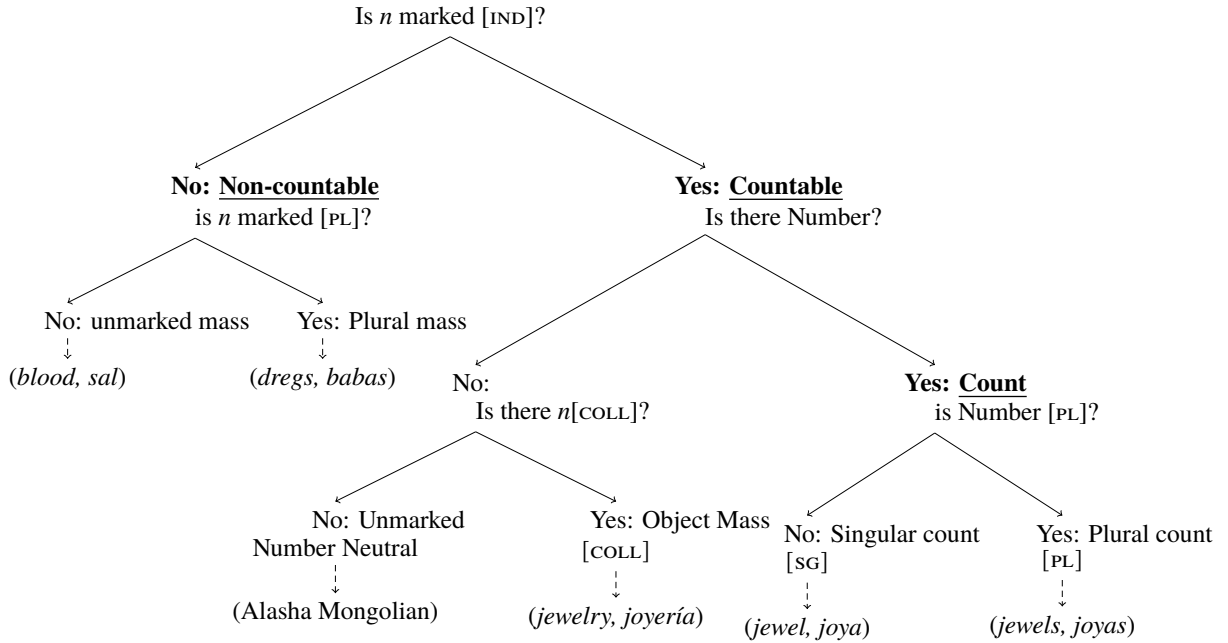
The hypothesis is very much in line with Deal's (2016; 2017) conclusion that what determines whether a root has discrete individuals that can be counted or not is syntactically determined. Building on Deal's insights, i.e. every language makes a countability distinction, regardless of whether it makes an overt count-mass distinction, I take [IND] to be a universally grammaticalized feature, in the sense of [Cuadriano and Longobardi \(2016\)](#), that is part of UG's universal feature inventory: roots within every language, and across languages, will differ with respect to whether they have been [IND]-marked or not by the categorizer. The learner's task is to determine the syntactic conditions under which the root has been or can be licensed. That said, we can establish a formal typology of noun classes based on their underlying features. This is shown in the decision tree in [Figure 2](#), where variation is stated in terms of "yes/no" questions. As [Roberts \(2019, p.6\)](#) indicates when talking about parameters for variation, "this is an essentially expository move, but it has the advantage of making their binary nature clear, and it reminds us that the parametric options represent ways in which the child interrogates the [Primary Linguistic Data]".

The hypothesis in (95) provides an understanding of what countability is, and how it is different from the property of being count. Looking at [Figure 2](#), nouns that are unmarked for [IND] features are non-countable, whereas all the nouns that are marked for [IND] are countable, regardless of whether they are count or mass. In fact, it is possible that a noun does not project Number and yet it is countable: object mass nouns and unmarked number neutral nouns, e.g. unmarked inanimates in Alasha Mongolian ([Toquero-Pérez 2024](#)).<sup>29</sup> Therefore, the hypothesis correctly predicts that count NPs are a subset of the NPs that are countable: {count NPs}  $\subset$  {unmarked number neutral NPs, count NPs, object mass NPs}. Despite the fact that singular count nouns do not allow modification by quantity adjectives (e.g. *\*much/more book*) because of the independent requirement of cumulativity imposed by these expressions ([Krifka 1989](#); [Chierchia 1998](#)), they can still be counted via numeral modification: *one book*. In fact, if size/shape adjective

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<sup>29</sup>Other examples of languages with countable number neutral nouns unmarked for Number might include Amharaic ([Kramer 2017](#)), Buriat ([Bylinina and Podobryaev 2020](#)), Haitian Creole ([Déprez 2005](#)), Hungarian ([Farkas and de Swart 2010](#)), or Western Armenian ([Bale et al. 2011](#)).

Figure 2: Predicting countability asymmetries



modification is also sensitive to the NP being countable via the lexical presupposition on its individual argument, as Deal (2016, 2017) proposes and I have endorsed here, then all these three types of NPs share that property by virtue of being [IND]-marked. I take all this as evidence for them being countable.

Besides, there seems to be (i) a correlation between being count and being countable that I describe in the generalization in (96) and (ii) a generalization regarding plural marking, based on the availability of plural mass, that I describe in (97). In fact, the generalization in (97) provides support for the separation of number and individuation features that I have motivated in the paper.

(96) **The Count-Countability Generalization**

Being count entails being countable, but being mass does not entail being non-countable.

(97) **The PL-Marking Count Generalization**

Plural-marking on the noun need not entail count syntax.

Last but not least, I want to address the question of variation. Languages might differ as to whether Number is projected and the location of the relevant features. For example, the fact that same expression ‘X’ is count *mueble* but *mobiliario* is mass is accounted for by saying that the former expression has Number whereas the latter does not. It may also be the case that the same feature is distributed over different heads in the extended projection in the same language. That is the case of plural count nouns (e.g. *bubbles*) and plural mass nouns (e.g. *suds*). In a similar vein, we can say that the reason that the Czech counterparts of English object mass nouns can be modified by numerals is because [COLL] is a Number feature in the former language but not in the latter. As a result of there being Number, the functional head that hosts numerals can be merged. In this regard, we can conclude that the variation is located in the syntax.

However, we have also see cases where variation may be much less systematic; at times, it is restricted to the lexical items that can be found in a particular context, which is largely language specific. Such



was the case of gaps in the paradigm of English doublets, and the environments where certain roots may be licensed. The proposal that I have developed here provides an answer for such variation and for the existence of those gaps: it is syntactically conditioned lexical variation. In other words, variation in this domain results from the way that the syntax puts terminal nodes together in concert with the satisfaction of the different requirements at the interfaces (both PF and LF).

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