

Countability Shifts and Abstract Nouns*

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Abstract

The paper examines the mass/count distinction in abstract nouns, starting from the corpus-derived observation that most of the nouns that can be used in count or mass syntactic contexts (“elastic nouns”) are (arguably) abstract. The paper evaluates various tests for mass/count status and different criteria for “abstractness”, proposing seven semi-productive meaning shifts that can result in a transition from mass to count or vice-versa. Section 4.2 addresses the relation between abstract nouns and kinds (are bare abstract terms “names of kinds”? What are their instances? Are they always kinds, even as predicates? What types of meaning shifts are applicable to them?). The possibility of a degree argument is also discussed: some count quantifiers over abstract mass nouns range over degrees, but not all abstract nouns have this option. We use the Bochum Countability Lexicon to detect elastic nouns and classify them via morphological affixes, attempting a survey of possible meaning alternations.

1 Introduction

The literature on the grammatical distinction between “count” and “mass” nominals has long tried to identify semantic criteria that could give a rationale for the existence of these two classes. A simple approach, popular in descriptive grammars (see Jespersen 1954 and Renzi 1995 for Italian) has prototypical mass nouns like *water* or *gold* refer to “substances”, and prototypical count nouns like *dog* or *gold ring* refer to discrete “objects”. Link (1983) offered a formal translation of this idea; in this system, count and mass nouns denote in distinct domains, with different properties: the domain of count nouns has atomic elements, the domain of masses does not. This captures the intuition that masses, unlike the objects to which count nouns refer, are *non-quantized* (being non-quantized means that if $p(x)$ holds and y is part of x , $p(y)$ also holds;

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this is the *divisive reference* property in the terminology of Cheng 1973); a mass noun like *space* has no parts which cannot also be described as *space*.

This picture has long been known to be too simplistic. There are, for instance, near synonyms, both within language (*shoes/footware*) and across languages (English *hair*_{mass} vs. Italian *capelli*_{count, plur}) where resorting to a completely distinct domain of reference seems undesirable (Chierchia 1998a). Moreover, the existence of atoms appears to be neither sufficient nor necessary to distinguish the two classes. Not sufficient, because mass nouns like *furniture* or *luggage* (Doetjes' (1996) *count-mass* nouns) seem intuitively endowed with atomic parts (those we refer to with the expression *piece of furniture/luggage*); not necessary, because count nouns such as *object*, *splinter* or *part* do not seem to have subparts which cannot also be described as objects, splinters or parts (see Moltmann 1997, (1998) and Rothstein 2010 for discussion). Given these facts, it is significant that in recent years, the focus has shifted from the *existence* of minimal subparts to their *accessibility* for counting (atoms in masses are said to be “foregrounded”, in Chierchia's (1998b), (2010) terminology; mass nouns refer to objects “in bulk”, in Ojeda 2005), or to whether the minimal elements can or cannot overlap (Landman 2010).

Despite the existence of a lively discussion on these topics, it is interesting to note that most of the nouns used as examples of mass or count are *concrete*. One aim of this paper is to carry out a preliminary exploration of the countability status of *abstract* nouns, an extremely diverse (meta)class which — setting aside the case of eventive nominals — has received comparatively little attention in the semantic literature, despite notable book-size exceptions such as Asher (1993) and Moltmann (2013).

Some special properties of abstract nouns with respect to countability were already discussed in Tovená (2001) and Nicolas (2002, Nicolas (2004), but abstract nouns are interesting in many ways and for different reasons. One is their sheer number: in some *genre* (e.g. much of scientific writing) nearly all nouns are arguably abstract. A second one is that abstract nouns (“abstracts” in what follows) frequently seem to alternate between a mass reading (e.g. *hope gave him joy*) and a count reading (*his three hopes, one great joy*). The goal of this paper is thus to look at abstract terms from the standpoint of the count/mass distinction, asking which meaning shifts might be most common with them, and if and how they differ from more familiar mass nouns like, as a matter of fact, *concrete*.

Some preliminary steps will be needed, and indeed the first three sections of this paper mostly deal with general issues, i.e. the choice of the most distinctive morphosyntactic markers for the count/mass distinction (Section 1.1), and the question whether countability is a lexical or cognitive property of nouns (Section 2). Section 3 will review the types of mass/count conversion operations that have been proposed for nouns in general, and discuss a few additional possibilities.

From Section 4 we turn to issues specific to the class of nouns under study, starting from the choice of a suitable definition of “abstractness” (Section 4.1) and continuing with the problem of how abstract nouns in determinerless argument position relate to kinds and their instances (Section 4.2) and what kind of property we are modifying when we talk about *much courage*, or *a great courage*, as opposed to *much water* (vs. **a great water*) (Section 4.3).

Finally, Section 5 examines the countability status assigned in the Bochum Countability Lexicon to various classes of mass nouns, specified on the bases of their morphological and semantic features.

1.1 The grammar of countability

Obviously, a discussion of the semantic dimensions of the countability shift presupposes a criterion for when a noun is *grammatically* count or mass. The main criteria found in the literature are:

- (1) “Mass nouns” (*mud, wine, courage, ...*)
 - a. appear in the singular with the determiners *much, less, a little, a bit of, more*
 - b. appear without any determiner in the singular in at least some argument positions (“bare singulars”), in Germanic and most Romance languages;
 - c. can be accompanied in the singular by adjectives such as *abundant, boundless, considerable* (Baldwin and Bond 2003).
- (2) “Count nouns” (*dog, table, project, ...*)
 - a. appear in the singular with the (complex) determiners *every, each, a (single), one*
 - b. appear in the plural with (complex) determiners such as *many, few, a dozen, two, forty-four, a bunch of, a number of, etc.*
 - c. appear in argument position without a determiner only in the plural (“bare plurals”), in Germanic and most Romance languages;
 - d. can be accompanied by adjectives such as *numerous, innumerable*.

Mass nouns are typically syntactically singular,¹ but have properties characteristic of plural count nouns. Like masses, plurals are non-quantized, down to the singular (a sufficiently large subpart of a group of *horses* is still *horses*). Masses and plurals also share the *cumulative reference* property (Quine 1960): if $p(x)$ and $p(y)$ then $p(x+y)$: *water plus water* can still be described as *water*, *horses plus horses* is *horses*. In contrast, a part of a horse (a countable singular) is not a horse, a horse plus a horse is not a horse. From a distributional standpoint, a striking fact is that singular mass and plural count noun can be bare (i.e. determinerless) arguments in most Romance and Germanic languages ((1b), (2c)), while singular count nouns cannot (cf. *I sell *computer/computers/food*).

This similarity between plurals and masses has prompted Chierchia (1998a) to propose that masses have a denotation which is the union of the denotations of a singular and plural count noun (*footware = shoe ∪ shoes*). This explains, among other things, the observation that mass nouns are not found in the plural (**oxygens, *footwares, *courage, *stuffs*, etc.), or when they are, their meaning seems to have shifted away from the singular meaning. This fact leads to another possible criterion to distinguish mass from count:

- (3)
 - a. If a mass noun pluralizes, its meaning shifts in ways which are not solely related to number (e.g. *much wine*: amount; *many wines*: variety)
 - b. Count nouns can generally pluralize without any meaning shift unrelated to number (the difference between *dog* and *dogs* is simply in the number of animals)

Understanding the nature of the shift associated with plurality (but also applicable to singular nouns in some cases) will be one of the main goals of this paper.

¹Here I set aside plural mass nouns, defined as nouns which are syntactically plural but cannot be counted, like *brains, police* in British English, *viveri, vettovaglie* ‘staples’ in Italian.

2 Countability: lexicon or cognition?

A preliminary question, as one ventures in the domain of countability, is whether “being mass” or “count” is a *grammatical* feature specified in the lexicon on nominal roots,² (see Chomsky 1967:82, Quirk, Greenbaum, Leech, and Svartvik 1972:127, and McCawley 1979 for a discussion from a lexicographic perspective), or rather a context-driven meaning aspect which can in principle be present in any noun, more or less easily depending on encyclopedic features of the noun’s denotation. The latter position was originally put forth in Allan (1980) and Pelletier and Schubert (1989), and has been recast in syntactic terms in Borer (2005). I will limit the discussion to Borer’s work, given the resonance her proposal has had in the literature on the syntax/semantics interface.

According to Borer, being mass or count can only be a property of Determiner Phrases (DPs) as a whole; lexically, all nouns are mass; the ability for a noun to be counted comes from a functional projection, CIP, which selects the NP proper and returns discrete predicates. The CI projection is overtly realized as a classifier, in Chinese or other classifier languages, or as the plural morpheme in English and other languages that mark singular/plural morphology (see Borer 2005:ch.4). Mass DPs are nominals where the CIP layer is missing, allowing the non-quantized meaning of N to percolate up to the DP level (4).

- (4) a. [DP D [#P three [CIP cat_i+s [NP t_i]]] *count, N moves to CI⁰*
 b. [DP D [#P much [NP salt]]] *mass*

In defense of the idea that the countability of a noun is not marked in the lexicon, Borer offers examples of mass nouns which can be used as count (*a wine, a thread, a salt, a stone*) and of count nouns used as masses (*that’s quite a bit of table/carpet for that money*), pointing out that to the extent nouns can be shifted to a count or mass meaning the presence of a formal feature which can be overridden is theoretically undesirable (as it would be a grammar in which nouns are lexically marked “masculine” or “feminine”, if it turned out that masculine nouns can nearly always appear as feminine and vice-versa).

Evidently, the force of Borer’s argument rests on the number of nouns which can be added to the list of examples above (masses which can be count and vice-versa), and to the extent to which this change is accompanied by a *regular* meaning shift. The presence of a meaning shift which has nothing to do with atomicity or granularity and which is, in addition, unpredictable, would mean that the nouns at issue must be listed in the mental lexicon. At that point, the lexicalist can just argue that there are two words, one count and one mass, connected in most cases by polysemy; what looks like a shift is merely the selection of one of the two forms.

The first part of the issue — how many nouns shift — is relatively easy to answer. The syntactic patterns in (1) and (2) can be turned into regular expression searches over a corpus of naturally occurring language. Using a subset of the indicators in (1) and (2), Katz and Zamparelli (2012) studied the frequency with which thousands of nouns appeared in unambiguously mass or count contexts in a 2.7 billion word corpus of English (UKWAC, Ferraresi, Zanchetta, Baroni, and Bernardini 2008).³ The results showed a large overlap between the two classes, which is not

²And derivational affixes, since some, e.g. the *-ware* of *kitchen-ware* can trigger a countability shift.

³The possibility of being bare argument turns out to be very unreliable in a Web-derived corpus, due to the presence of section headings which use a special syntax, which often lacks determiners; see Baroni, Guevara, and

predicted by a clear-cut lexical system in which countability is like gender or declension class.

“It is [...] not the case that the rate with which a noun is used as a mass expression is inversely proportional with the rate at which that noun is used as a count expression. Specifically, the rate of use with mass determiners is essentially uncorrelated (-0.028) with the rate of use with count determiners, on a per-noun basis”
Katz&Zamparelli 2012:373

These findings undermine the simplest lexicalist position, but do not clearly point to a single alternative. What the study shows is that there are nouns which are rarely used as mass, others which are rarely used as count, and many which are used both ways (the ones we will call “elastic nouns”). Unfortunately, this still cannot tell us how the meaning of a word changes depending on its countability. A better tool to address this question is the Bochum English Countability Lexicon (BECL) Kiss, Pelletier, and Stadtfeld (2014a), which specializes in the attempt to specify the meaning shifts that elastic nouns undergo. We will return to this tool in the last section of the paper.

Before getting there, let’s consider the problem of the non elastic (henceforth “rigid”) part of the lexicon. What shall we do with it? In Borer’s approach, a mass-only noun is simply one that refers to an object that is difficult to conceptualize in discrete units. This means that the meanings of minimal pairs such as *footware* and *shoe* (*change/coin*, *curtain/drapery*, *knife/cutlery*, etc.) hide a fundamental difference which blocks the insertion of a CIP layer in the first, making it a mass, and allows it in the second.⁴ What would this difference amount to? One may call this property “non-quantizability”, or the “bulk-reference” property, possessed by *footware* but not by *shoe* — but for all intents and purposes, this property cannot be called anything else than ‘being mass’. Unless one can make a case for a semantic difference *independent* from countability, which triggers mass or count as a side effect, near-synonym pairs with different countability status are very difficult to explain in Borer’s terms. The problem is reminiscent of one attributed by Chierchia to Link’s approach: if *shoe* and *footware* are drawn from different ontologies, how to spell out what they have in common?

Lexicalist countability theories are not unequipped to deal with nouns that shift between count and mass: they must postulate that there is a (smallish) set of ways to turn a mass noun into a count one and vice-versa, at the cost of a meaning shift. Borer acknowledges the possibility that a clash between the presence of CI (count) and the noun meaning could result in meaning coercion,⁵ but she does not seem to think of these phenomena as something that grammatical theory should strive to explain (see her discussion on pg. 106). This paper takes the opposite view: exploring the range of meaning shifts which coercion allows and the kinds of nouns to which it is applicable is a pressing topic for research, particularly when these shifts apply productively, as one could expect from real semantic operators.⁶

Zamparelli (2009).

⁴One could of course suggest that **footwares* does not exist because it is blocked by the existence of *shoes*, but this begs the question of why *footware/shoe* pairs should develop in the first place. Moreover, in Borer’s account the count version is the complex, derived case, so if anything, we would expect *footware* to block *shoe(s)*.

⁵“Coercion, then, is but the conflict that emerges when the grammar returns a computation which is not fully compatible with the conceptual properties of listemes embedded within these structures” (Borer 2005:106)

⁶Again, contrast the situation with that of the grammatical feature GENDER in a language such as Italian. Nouns

Borer raises objections against a countability-shifting operator. If it existed — she argues — it should be able to apply also to constituents larger than NPs. On the opposite, once a noun has been modified by plurality (5a), amount nouns (5b) or amount modifiers (5c) (adding a CIP layer, in her approach) it cannot switch status:

- (5) a. *There is rabbits in my stew. *Borer 2005:104*
 b. *There is a portion of rabbits in my stew.
 c. *Much rabbit are hopping about.

This argument, however, only applies to a completely unconstrained and essentially pragmatic notion of semantic operator. If meaning-shift operators are seen as part of the semantic computation, hence part of the grammar, there is no reason why they could not be restricted to apply to NPs only. Even in a totally unconstrained view of semantic operators, Borer’s argument has flaws. (5a and c), for instance, contain agreement mismatches, and it is dubious that a semantic shift should be able to override a syntactic agreement clash.⁷ Once agreement is controlled for, it is not so obvious that plurality is incompatible with mass meaning. *There are apples in the soup* can have a meaning almost identical to *there is apple in the soup*: “apple pulp in an amount greater than what a single apple can provide” (in the terminology of Moltmann 1998, *apples* in this case are not an “integrated whole”). This can also be seen with measure phrases:

- (6) a. There is one kilo of apple?(s) in the soup. *individual apples weigh <1 kg*
 b. *There is (one kilo of) pea in the soup.
 c. There are peas in the soup. *not necessarily the individual items, but pea pulp*

To be sure, when a numeral is inserted the mass reading is blocked:

- (7) a. There is one kilo of (*two) apples in the soup.
 b. There are 20 peas in the soup. (Go find them!)

But this could be due to the fact that the measure phrase *one kilo* must apply to a position lower than the cardinal (a general fact with pseudopartitives), or that the number *20* in (7b) is redundant (why counting them if you are not using this information?). I conclude, *contra* Borer, that the possibility of semantic countability-shifting operators remains open.

Let’s now consider some of the more general shifts that have been proposed in the literature.

3 Countability shifts

Four main countability shifts can be distilled from the literature (see e.g. Pelletier and Schubert 1989, Chierchia 1998a, Cheng and Sybesma 1999):

- (8) From mass to count

come from the lexicon as either masculine or feminine; those which appear to go both ways are cases of homonymy (*parto_{masc}* ‘delivery’ vs. *parte_{fem}* ‘part’) or polysemy (e.g. *mela_{fem}* ‘apple’ vs. *melo_{masc}* ‘apple tree’). But unlike with countability, there is no productive process which can change the gender of a noun.

⁷In some languages, an externally singular subject can be compatible with a semantically-induced plurality in the verb (as in *this matching plate and wine glass are always sold together*), but the opposite is normally not true: *the cat and the dog *is/are a problem*, see Zamparelli (2008) for discussion.

- a. **Kind-formation:** reference to the individual types or varieties of a certain noun
(*three wines* ⇒ *three types of wine*)
 - b. **Container reading:** reference to canonical doses or measures of a certain, substance-denoting noun
(*I drank three beers* ⇒ *three pints/glass/standard doses of beer*)
- (9) From count to mass
- a. **Food-stuff reading:** reference to the food stuff derived from an animal/plant-denoting noun
(*In Australia I tasted kangaroo* ⇒ *kangaroo meat*)
 - b. **Lewis/Pelletier Grinding:** reference to the undifferentiated material substance of an object that has been ground
(*After the explosion, there was computer all over the floor* ⇒ ... *computer-derived material*)

Some authors do not distinguish (9a) from (b), but I think that the food interpretation is far more natural, and selective, than the rather far-fetched (9b). *Frenchmen eat snails* does not imply that they also eat the shells; grinding cases involve any part.

The shifts above are expressed as functions: given an input — a noun with a certain countability status — they return one with a different status and a partly different meaning. This presupposes that one can identify an initial and a derived state, which might not always be easy in some cases (see below). For concrete objects I will assume that taking the living animal or the structurally organized object as primitive and the derived food or pulp as secondary (with the result that the shifts in (9) increases entropy) is more natural than the opposite. If this is correct (10) shows that in some cases two of the shifts above must have happened in sequence, but their order must be free (*animal* ⇒ *food* ⇒ *type of food* in (10a); *bird* ⇒ *type of bird* ⇒ *type of food* in (10b)):

- (10)
- a. Cook apprentices at this school must be able to prepare at least two **lambs**, e.g. kofta and biryani, without looking at the recipes.
 - b. In the Hunting Season Celebration Party two distinct **birds**, often a grouse and a pheasant, are served as second course.

This discourages a “cartographic” analysis which would be the mirror image of Borer’s: assigning these meaning shifts to some NP-internal functional projections. These projections are normally assumed to be ordered (see Cinque 2002, a.o.), so a switch in their application would be unexpected.

The examples so far were all verbal arguments. If we look at comparatives, other types of meaning shifts emerge. One is illustrated by (corpus derived) examples such as:

- (11)
- a. Surface RT is more tablet than PC.
 - b. Fitness centers that are more spa than gymnasium
 - c. That apple tree is more apple than tree.

This shift turns a noun into a graded predicate expressing similarity to that noun: (11a) is akin to *RT is more tablet-like than PC-like*.

(12) **Similarity-to-N:**

degree to which an individual has properties characteristic of N (*more PC* \Rightarrow *more with the properties of a PC*)

This shift differs from those seen so far in two respects. First, it can apparently apply to any noun, and the probability of finding a noun in this construction seems essentially uncorrelated with the probability of finding it in the other mass-only environment listed in (9) (*tablet* is after all a fairly prototypical count noun). Second, it is restricted to a comparative frame (*more/less N than N, as much N as N*), where two properties are compared; it follows that the result of the shift does not behave like a nominal, but as a predicative category (indeed, *N-like* is an adjective, *with the properties of N*, a PP): the construction gets much worse if used directly in argumental position, particularly as a subject (13), and even as an apposition (14).

- (13) a. ??With Surface RT, I bought more computer than tablet.
b. *With Surface RT, more tablet (than PC) entered my house (than PC).
c. *More songwriter wrote these songs than singer (performed)
- (14) a. With Chomsky, a greater linguist visited this university than political scientist.
b. *With Chomsky, more linguist visited this university than political scientist.

Despite being predicative like a common noun, *more N than N* cannot be used as a nominal D restrictor (15), again behaving as an adjective.

- (15) *A/Some [more tablet (than PC)] is expensive (than PC).
Intended meaning: ‘An object/Something which is more tablet-like (than PC-like) is expensive.’

If the second argument of the comparative is an individual, rather than a property, as in (16a), the meaning of the first N changes slightly; it can be found with scare quotes (16a), and in English the form *of a(n) N* is preferred (16b).

- (16) a. Bill is more “songwriter” than Marc.
b. Bill is more of a songwriter than {*of a singer / ??singer / Marc}
- (17) a. This piece of furniture is more “chair” than that one.
b. This piece of furniture is more of a chair than {??of a sofa / *sofa / that one}

I propose that (16a)/(17a) are prime examples of a shift different from (12), whose effect is essentially metalinguistic (18).

(18) **Metalinguistic shift:**

degree to which something can be appropriately called “N” (*N* \Rightarrow *appropriately called “N”*)

Judging from the possibility of scare quotes, it is likely that the shift in (18) can also apply to the frame in (11), though it feels perhaps more natural in (16) and (17). Note, moreover, that both shifts are indifferent to the plural (i.e. count) or singular status of their nouns, as (19) shows, and also orthogonal to whether the subject denotes a kind (20) or not.

- (19) a. Those boxes are definitely more chairs than beds.
 b. Those boxes are definitely more “chairs” than those dirty bags.
- (20) a. Autogyros were designed to be more helicopters than airplanes. *Kind*
 b. By now my old car was more artwork than wreckage. *Object*

In her PhD thesis, Sassoon (2008) proposes that nouns have a full set of graded dimension which are used to compare them to prototypical member of their class. Robins, for instance, are “better”/more prototypical birds because the values for various properties they have (movement, size, color, etc.) are closer to the average values of other members of the bird class than those of, say, penguins.⁸ Adjectives, on the other hand, would differ from nouns in being graded only along one dimension — the one which gets measured in comparatives (*Jack is taller than Bill*).

Now, consider an abstract schema for (11) and (16):

- (21) a. DP_1 is more N_1 than N_2
 b. DP_1 is more N_1 than DP_2

An interesting possibility is that the shift in (12) is due to the presence of an operator over N_1/N_2 which converts the multidimensionality of nouns into an adjective-style single measure: the number of dimensions of DP_1 which are compatible in value with the corresponding dimensions of N_1 (i.e. $OP_{sim}(DP_1, N_1)$). Thus, an object which is a prototypical tablet will have a high score in a large number of properties that are characteristic of tablets (e.g. size, portability, low thickness, battery). This number is then compared to the analogous number for DP_1 and N_2 ($OP_{sim}(DP_1, N_2)$).

- (22) DP_1 is more N_1 than $N_2 = OP_{sim}(DP_1, N_1) > OP_{sim}(DP_1, N_2)$

The metalinguistic shift, on the other hand, achieves the same linearization by measuring the extent to which a DP has enough N-properties to be properly classified as “N”, and compares that against the possibility for DP_2 to be classified in the same way.

- (23) DP_1 is more N_1 than $DP_2 = OP_{meta}(DP_1, N_1) > OP_{meta}(DP_2, N_1)$

A syntactic effect of this process is that the nouns under comparison are reclassified as non-nominal predicates, hence the ungrammaticality of (13). To summarize, I am proposing that the dominant meaning of e.g. (24a) claims that Chiron had more human features than equine features, whereas (24b) claims that, compared to Naxos, Chiron possessed a larger number of the stereotypical human feature needed to have him classified as “man”.

- (24) a. Chiron the centaur was more man than horse.
Chiron has more men-like features than horse-like features (though properly speaking, he is neither)
 b. Chiron the centaur was more man than Naxos.
Given the properties that have, you would more correct at classifying Chiron as “man” than Naxos.

⁸Interestingly, a similar idea is used in modern computational semantics (see e.g. McDonald and Ramscar 2001) to measure the semantic distance between words using distributional property vectors.

Where does this leave us? Though interesting, the similarity and metalinguistic shifts seems to apply to so many classes of nouns and noun forms (and possibly, not to nouns alone) that they contribute little to a study of how countability relates to semantic shifts. The study in Katz and Zamparelli (2012) included *more* in the patterns used to extract mass nouns, but this choice might have artificially increased the set of elastic nouns.⁹ Future studies should strive to control for cases like (11) (*...more tablet than PC*), excluding the singular comparative from the list of constructions used to extract mass nouns.

4 Going abstract

One important observation that emerges from Katz and Zamparelli's ((2012)) corpus-based approach is that the vast majority of nouns that are grammatically mass according to the criteria in (1) do not seem to refer to concrete objects. The proportion grows if we consider the subset of mass nouns which are also found with typical count determiners such as *every* and appear in the plural with cardinal numbers, thus qualifying as “elastic”. Here is a representative sample of the most frequent such nouns, extracted from UKWAC:

- (25) action activity agreement authority business challenge chance change character charge choice colour competition concern contact content control cost cover credit crime detail development effect error exercise fire force form glass government grain ground lead length life light matter movement need opportunity pace paper performance possibility practice priority production property range reading reason regulation repetition response return room sense service shade skill sound space sport structure style talk text treatment use value variation variety volume wine work

While it is obvious that these nouns (with the exception of *glass*, *paper* and *wine*) do not refer to the canonical substances we find in the literature, saying how many of them are “abstract” requires some criteria for abstractness. Defining what these might be turns out not to be an easy task.

4.1 Ways to be abstract

What should a noun be to be abstract? The most common answer is often given in the negative: a noun is abstract when it does *not* refer to something which can impinge on the senses. This criterion immediately suggests that there should be degrees of abstractness: psychological states, like *joy*, *pain* or *fear* are “felt” by their experiencers (though not by others), and should thus count as less abstract than say, *chance*, or *priority*. An even stricter criterion, popular in psychological research, is *imageability* (the extent to which a pool of people judge that a concept can be represented by an image, see e.g. Della Rosa, Catricalà, Vigliocco, and Cappa 2010). However, these indexes are based on the average judgment of naive informants, who might have very different criteria, or none at all. Moreover, there are concrete objects, like spleens or oil fields, which are

⁹“More” features prominently in the battery of tests used to compile the BECL, Section 5, but there it was filtered by human judgment, plus discussion.

hard to visualize, and abstract ones which are not (most would argue that *absence* is abstract, but the absence of light, i.e. *shadow*, is plain to see.)

A completely different criterion for abstraction uses morphology as a guideline. In English, one could regard as abstract all the nouns derived from the suffixes *-ness*, *-ity*, *-tion* or *-hood*, *-itude*, *-cy*, *-ment*, *-ship* (cf. German *-heit*, Italian *-ezza*, *-ità*, etc.), or more generally, all the nouns derived from gradable adjectives (this is the class Nicolas 2004 focuses on). This approach extracts a reliable but small subset of the abstract lexicon: in the list of the 76 most common elastic nouns in (25), only 5 end in *-tion*, 5 in *-ity*, none in *-hood*, *-ship*, *-cy* or *-ness* (except the non-compositional *business*). 5 more end in *-ment*, and at most 4 are de-adjectival (*active/activity*, *possible/possibility*, *long/length*, *prior/priority*). On the other end, about 44 nouns have highly semantically related verbal forms. This suggests the possibility that looking at nouns derived from verbs via zero-affixation might be a better way to find abstract mass nouns, though we still find pairs such as *to win/a win*, *to vote/a vote*, which are not mass, and some non corresponding cases (*to book/a book*).¹⁰

Despite their limited recall, it is important to keep in mind that morphological criteria can be extremely valuable when the goal is to try to pair derivational affixes with specific types of meaning (e.g. “modes of being abstract”), working with large numbers of lexical items (see a computational attempt in Marelli and Baroni 2015, and Section 5).

Yet another criterion for abstractness, adopted by Guarino and Welty (2000) in their work on formal ontologies, rests on the possibility of a spatiotemporal collocation: abstract nouns are those that denote objects which do not have a location in space or time (though it is not clear what to make of the words *time* or *space* themselves). In some accounts (possibly dating back to Plato), these objects are the *attributes* of things (see e.g. Mill 2002, Ch.2.4). Events would not count as abstract in this classification (they can, moreover, impinge on the senses: think of *explosion*, *delivery* etc.), though the fact that their spacial location may be vague might make them less concrete than material objects.

Interestingly, according to this criterion many of the elastic nouns in (25) would end up being abstract in their mass use, concrete in the count one. Excluding from consideration words where the mass and count uses the corpus picks on might unrelated (e.g. *change* ‘coins’ and *changes* “differences”), we can easily find pairs such as (26).

- (26)
- a. *Activity* (being active) vs. yesterday’s *activities* (cf. actions)
 - b. *Agreement* (a state of concord) vs. the recently signed *agreements*
 - c. *Authority* (a social status) vs. the local *authorities* (people)
 - d. *Control* (an ability) vs. the airplane’s *controls*
 - e. *Property* (ownership) vs. lost *properties*

On the opposite, it is difficult to find examples of elastic nouns in which the count version has no spatiotemporal collocation, but the mass version does.¹¹

¹⁰However, a check with the noun classes in the BECL (see Section 5) shows that of the 332 verb-identical nouns which are present in the BECL noun list, 86% are rigidly count and 16% rigidly mass. So, while verbs might be a good way to find abstract (mass) nouns, they are not a good way to find elastic nouns.

¹¹A near miss is cases like *water* vs. *the waters of the Atlantic*; *sand* vs. *the sands of the Sahara*, where the

Some approaches to the abstraction problem are based on a methodology which is quite well-established in semantics: to tell whether something is abstract or concrete, look at the range of predicates that naturally apply to it (the same principle used, for instance, to distinguish *particular instances* from *kinds* in Lawler 1973, Carlson 1977 and many others). For instance, Guarino and Welty’s criterion would mean that predicates such as *has a mass of X* and *will happen at T* should not apply to true abstracts. If we want to exclude psychological states, we would add *was perceived by Y*, and so forth. One important consequence of this predicate-based view is that the notion of “abstractness” turns out to be clearly orthogonal to two apparently similar notions: “generality” and “reality”. Let’s consider them in turn.

Lexical properties are arranged in hierarchies of increasing generality: poodles are dogs, dogs are mammals and mammals are animals. However, it would be wrong to say that *animal* is more abstract than *poodle*; it is only more general. This is because *animal* can support any predicate that can be applied to *dog*: it can bite, eat or drink. It follows that supercategories of concrete objects are in turn concrete objects, which implies that there should be no supercategory that spans abstract and concrete objects (indeed, ontologies such as Wordnet or DOLCE do not have a single root, a “general entity”-type object).

The next question is whether *kinds* of concrete objects (bare plurals like *dogs*, definites like *this kind of animal*) are more abstract than their instances, or just more general. The answer depends on one’s theory of the way predicates apply to kinds. Examples like (27a) suggest that they might be abstract (though possibly not Guarino-Welty abstract), since no specific concrete object is widespread or comes in multiple varieties (after all, kind terms like *order*, *species*, *genera* and *variety* belong to the scientific lexicon of taxonomic biology). But the predicates in (27b) speak in favor of concreteness: they are the same that could apply to any individual.

- (27) a. Dogs {are widespread / come in many varieties}
 b. Dogs {bark / have fur / scratch themselves}

Of course, if (27b) are actually generic quantifications over individuals, as many have proposed since Gerstner and Krifka (1987, Diesing (1992), such predicates would simply not count for establishing the concreteness of “real” kinds. Since the matter hinges on the broader problem of genericity we will leave it unresolved here, pointing out that there is at least partial evidence that kinds of concrete objects are (more) abstract than their instances. The inverse issue — whether bare abstracts denote kinds — will be taken up in the next section.

Much of the same reasoning applies to the predicate “exists in the real world” (the test for reality). Dragons do not exist, but in those stories where they do, they (mostly) have properties typical of concrete objects, while the similarly non-existent “wizardry” passes any test for being abstract. There may be unclear cases in between, but in general one wants to be able to distinguish abstract and concrete objects regardless of whether they belong to the world of evaluation or to some other (possible) world.¹²

count version seems to refer to an expanse of space (see Acquaviva 2008). This would still not qualify as abstract in Guarino and Welty’s formulation, but it comes closer.

¹²The reader interested in this discussion from a philosophical viewpoint is referred to the entry *Abstract Objects* in the Stanford Encyclopedia of Philosophy, <http://plato.stanford.edu/entries/abstract-objects/>. From the standpoint of linguistics, finer categories are useful only insofar they trigger linguistic effects.

4.2 Abstract nouns and kinds

Though kinds of concrete objects might or might not be abstract, there can be kinds of abstract objects, like the bare plural subject of (28a). And there are, indisputably, kinds of mass nouns, as in (28b).

- (28) a. [Social needs] {are common / come in many varieties}
b. [Steel] {is common / comes in many varieties}

Putting the two observations together, we expect that bare singular noun arguments referring to abstract objects, like those in (29) should also be kinds, in agreement with the principle that all argumental bare nouns denote kinds in English (see Carlson 1977 and later Neocarlsonian analyses).

- (29) a. [Wisdom] is a property few people have. *from Moltmann (2004)*
b. [Humility] is a virtue.
c. [Ordinariness] is boring.

Carlson (1977) already supported this position, pointing out that, like other bare nouns, singular abstracts have a (quasi-)universal reading with individual-level predicates (30a) and an existential one with episodic ('stage-level') predicates (30b) (Carlson 1977:467). Overall, they pattern very much like *blood*, a concrete bare singular, in (31).

- (30) a. Democracy is a form of government. *Universal*
b. The Greek practiced democracy. *Existential*
- (31) a. {Justice / Blood } is scarce. *Universal*
b. Here there is {justice / blood} *Existential*

Both take narrow scope under intensional verbs ((32) cannot mean: there was some specific instance of justice/amount of blood which was looked for by someone), and accept some characteristic kind-level predicates (33).

- (32) The {doctor / crowd} was looking for {blood / justice}
- (33) a. {Democracy / Grappa} becomes more and more diluted as one travels South.
b. {Democracy / Grappa} comes in many different flavors.

This approach also predicts, correctly, that languages that use definite determiners to build nominal generics must also use them with universally-interpreted abstract nouns. In Italian this is true even in object position, where bare nouns are normally syntactically acceptable:

- (34) Gianni odia *(la) banalità.
Gianni hates (the) ordinariness.

But if bare abstracts are kinds, three questions arise.

- What are the instances of abstract kinds?
- In elastic nouns, what is the relation between the kind formed from the mass reading and that formed from the count one?

- Are bare abstract nouns *always* kinds?

The theory that bare singular abstract nouns are kinds has been especially defended and elaborated in Moltmann (2004, 2013).¹³ Moltmann points out that, contrary to a naive view which sees *ordinariness* as a nominalization of the corresponding adjective, meaning *the property of being ordinary*, the sentences in (35) are not synonymous with those in (36): the latter can be false when the former is true (e.g. being ordinary might be boring, but the abstract property of being ordinary might have an interesting formal semantic structure which makes it interesting *qua* property). Saying that these nouns are kinds avoids this problem and simultaneously accounts for the data in (30), (33).

- (35) a. Ordinariness is boring
 b. Friendliness is interesting.
- (36) a. The property of being ordinary is boring
 b. The property of being friendly is interesting.

Turning to the nature of their instances, Moltmann (2004, 2013) proposes that abstract terms denotes *kinds of tropes*, where “tropes” are specific instances of property attribution (*John’s ordinariness, Sue’s friendliness*, etc.). Tropes are taken as primitives, and rendered as relations between an individual (*Sue* in *Sue’s friendliness*) and a set of properties (instances of friendliness. See Moltmann 2004, Sec 3.3).¹⁴ Moltmann (2013) also proposes that bare abstract terms *plurally refer* to the individual tropes across all possible worlds — an aspect which we set aside here for reasons of space.

With episodic predicates like (37), the relation which is established is not between the agent and the kind itself (*generosity_k*), but between the agent and specific manifestations of that kind, i.e. the individual tropes. In other terms, (37a) means something like *I have experienced acts or manifestations of generosity*.

- (37) a. I have experienced [generosity].
 b. I often encounter [hostility]

One potential problem is that one could then expect that the bare plural *acts of generosity* (or *instances, examples, tokens*, etc.), should always be synonymous with *generosity*, which it isn’t.

¹³Moltmann (2004) discusses abstract noun which are the nominalization of adjectives, like *wisdom, ordinariness* or *originality* (see her footnote 1). Moltmann (2013) extends the theory to cover many other types of nominalizations. In addition, this later work relies on the theory of *plural reference* (see Nicolas 2008, a.o.), which transfers plurality from the domain of reference (sets, pluralities in the sense of Link 1983, Schwarzschild 1996) to the manner of reference.

¹⁴Linguistically, tropes would be what is perceived in (ia), as opposed to (ib-d).

- (i) a. John saw Mary’s beauty
 b. John saw Mary
 c. ?John saw Mary’s being beautiful
 d. John saw that Mary was beautiful

Perception verbs have been used to motivate the ontological reality of events (*I saw Callas sing* = I witnessed a Callas singing event, Parsons 1990) or situations (Barwise and Perry 1983). Moltmann (2013, Ch.7.2) argues that events could indeed be seen as a kind of tropes.

- (38) a. [Generosity / ??Acts of generosity]_k are/is a virtue.
 b. John puts [generosity / ??acts of generosity]_k above all other virtues.

A similar problem is discussed in Yi (2015), who reports different truth conditions in (39a) and (b). In this case, the use of the definite in (b) blocks the existential reading, resulting in a reading which might be too strong (John might have just been looking for *some* wisdom). However, in (40), which only uses bare nouns, the (b) meaning ends up being too weak.

- (39) a. John is looking for *wisdom*
 b. John is looking for *the possible wisdom tropes*
- (40) a. At the end of his life, John finally found *wisdom*
 b. At the end of his life, John finally found *possible wisdom tropes/manifestations*

It is important to note that the problem holds with concrete mass nouns as well: if we assume that the instances of the kind *water* are something like *amounts* or *portions of water*, we do not get full equivalence between the two in e.g. (41) (except in the existential reading *there are portions of water which are H²O*).

- (41) {Water / Portions of water} is/are H²O.

Perhaps the contrasts in (38) and (41) could be attributed to pragmatics (why using *portions of water* if one is trying to get at the meaning of the much simpler *water*?). This is not implausible, but it is a dangerous path to follow. Recall the contrast in (35)/(36), where Moltmann replaces a simple description (*ordinariness*) with a more complex one (*the property of being ordinary*), to test if they are truly synonymous. If a complexity-based pragmatic theory could account the difference in judgment in the two cases, Moltmann's methodology risks to be undermined.

Leaving the matter unresolved, we return to the specific issue of elastic nouns. If N is elastic (e.g. *action/actions*, *hope/hopes*), can we identify a relations between the meanings of its bare singular and bare plural versions? Consider (42):

- (42) a. I love [action/actions] in movies.
 b. [Change/Changes] is/are part of life's essence.
 c. [Activity/Activities] keep(s) sleep at bay.
 d. [Contact/Contacts] is/are essential in life.

Given what we have said so far, the bracketed bare nominals are all kind-denoting, so, if the singular and plural versions are different in meaning (or, as it happens, felicity), this difference must be located solely in the meanings shift between the count and mass version. Moreover, the count versions cannot be obtained from the Kind-shift seen in (8)a: this shift would make the bare plurals in (42a,b) synonymous with their overt "bare kind" versions shown in (43), which are hardly possible.¹⁵

¹⁵The problem does not come from a ban on bare overt kind constructions, which do exist. (ia) is an example from Section 4.1 of this paper; (ib) has a fine existential interpretation.

- (i) a. Kinds of concrete objects might or might not be abstract
 b. Our zoo had common types of animals, plus some guest star.

- (43) a. ??I love [kinds of action(s)] in movies.
 b. ??[Kinds of change(s)] are part of life's essence.

Clearly, we need some alternative types of meaning correspondences, keeping in mind that it could sometimes be difficult to decide if they are directional shifts (and if so, in which direction), or a matter of lexical polysemy. An analysis of the list of frequent elastic nouns given above and repeated here for convenience, reveals a few relevant patterns (with overlaps).

- (25) action activity agreement authority business challenge chance change character charge choice colour competition concern contact content control cost cover credit crime detail development effect error exercise fire force form glass government grain ground lead length life light matter movement need opportunity pace paper performance possibility practice priority production property range reading reason regulation repetition response return room sense service shade skill sound space sport structure style talk text treatment use value variation variety volume wine work

A. Count nouns that refer to events, which can last, or happen at specific times (*yesterday's N*).
 At least:

- (44) action activity challenge change choice competition crime development error movement performance production reading repetition response service variation work

In several cases, the mass meaning seems to be directly related (quite possibly via the kind-instance relation) to the individual tropes in the way Moltmann suggests (e.g. *activity* is related to the totality of someone's individual activities, *change*, to the *changes*, etc.). In others, however, the relation is more idiosyncratic (*reading /readings* (poetry)), or the count version is more concrete (*work/works* (of art)).

B. Count nouns which are (more or less concrete) *result nominals* derived from the verbal root:

- (45) agreement charge choice contact content credit detail development effect error property regulation response service work.

possibly also *life* (result of *living*), *cost* (*money payed*), *opportunity* (*missed, taken*), *possibility*, *production*, etc.

C. Count nouns which seem to be derived via the Container-shift in (8b) (i.e. portions of the mass).

- (46) fire shade sound space text (time)

These cases are very close to concrete mass nouns like *water*, down to the possibility of an "expanse" reading (see footnote 11: *the fires of hell, the sounds of New Orleans, the shades of the jungle, the times of Camelot*).

D. Count nouns which seem to be derived by the Kind-shift: *need, sport, style* (also: *dislike, disadvantage*, etc.). So, *I practice three sports every week* cannot mean that I practice three sessions (i.e. "doses") of the same sport every week, but rather, three kinds of sport.

E. Yet other cases seem to refer to the agents of the verb (people or organizations: *government(s)*, *authority(+ies)*), but also the mass *crime* in *organized crime*), or have idiosyncratic polysemic relations (e.g. in *ground*, *paper*, *room (chamber)*, *volume (sound)*, *matter (gray)*; these are the nouns which the BECL calls *multiples*).

We conclude that if we treat bare elastic abstract mass nouns as kinds, the instances of these kinds might in some cases be strictly related to the entities denoted by their count noun counterpart (as in (A) above). In other cases the relation between count and mass version will be much more complex and unpredictable, often mediated by the verb underlying the nominal.

The third question to address in this section is what happens when bare abstract nominals are *not* treated as kinds. A case in point is predicate nominals.

- (47) a. Fido and Lara are [dogs].
 b. The content of this glass is [water].
 c. This is [vodka]. *pointing to some vodka*

To make (47b) work, *water* should denote a set of amounts/portions of water (a semantic type which is independently needed for quantificational cases like *some/much/a lot of water*_{<et>}).

What happens with abstract mass nouns? (48), uttered upon witnessing a particularly telling act or event, seem perfectly possible. The acceptability of these cases suggest that these predicative abstract cases can be property-denoting, much like *water*.

- (48) a. THAT was courage / character!
 b. THIS is {real justice / pure chance / perfect control / just practice / real content / total chaos ...}

But now, the nouns in (48) contrast with those in (49), which are frequently found as bare mass singular arguments in a UKWAC search, but never as bare mass predicate nominals.

- (49) ??THAT was {absurdity / allegiance (to ...) / blockage (of ...) / characterization (of ...) / deletion (of ...) / opinion (about ...) / possibility (of ...) / priority (to ...) ...}.

The difference between the two sets is that the nouns in (48) are either rigid (*courage*, *justice*), or have very different meanings as count and mass, while those in (49) are elastic and with the option of a semantically transparent indefinite singular (contrast with **a courage/justice*), which is put to use in:

- (50) THIS is {an absurdity / ?an allegiance (to ...) / a blockage / a characterization (of ...) / a deletion / an opinion / a possibility / a priority / ...} ...

This shows that English (and probably other languages: the pattern is identical in Italian) prefers to use the count version of (transparent) elastic nouns, rather than deriving a property reading from the mass version. This preference could point to the presence of a marked semantic operator, which derived the property denotation needed in (48) from the bare mass noun predicate, interpreted as a kind exactly as in (35). Using the count version (either as a lexical option in a polysemy relation with the count version, or as the result of one of the semiproductive deriva-

tions listed in A-E above) avoids this operator, and is thus preferred whenever possible. The two options are shown in (51).

- (51) a. This was [OP_{<e^k, <e^o, t>>} courage_k^{mass}]
 b. This was an [absurdity_{<et>}^{count}]

4.3 Gradedness in abstract nouns

We have so far mostly considered the role of *determinerless* abstract mass nouns. However, these nouns can also appear under regular mass determiners, just like concrete ones:

- (52) a. There was(n't) more / much / some / a bit of / a lot of {water / wine / furniture} left.
 b. There was(n't) more / much / some / a bit of / a lot of {patience / beauty / authority / courage / chaos} left in her.

It is well-established since Link (1983), Gillon (1992) a.o. that with concrete mass nouns these determiner measure *amounts*, and that these amounts are (for all practical purposes) *continuous*.¹⁶ This fits with the fact that, as we have seen in Section 1, concrete mass nouns have the divisive and the cumulative property:

- (53) a. Together, this water and that water are still water.
 b. Half of this water is still water

These properties extends to abstract mass nouns, though non-far-fetched examples are somewhat harder to construct, partly due to the resistance of bare abstracts to be used as predicates (see (49)). Still, Nicolas (2002) constructs convincing examples using the noun *part*, as in (54).

- (54) a. I could only admire part of the *disorder* that you left behind.
 b. During the day I can only see part of the *beauty* of Paris.

Distributivity succeeds for e.g. *chaos* (55a), but — Nicolas claims — fails for *idea*, a rigid abstract count noun (56).

- (55) This chaos is only part of the chaos that the children created in the apartment.
 (56) a. What you are hearing is only [part of the idea that I have]_i. *Nicolas' (2002:3)*
 b. ??[This idea]_i is more than enough for me.

Cumulativity is probably easier to test, and seems well-established for abstract and concrete mass nouns alike.

¹⁶The well-known exception is *furniture*-type mass nouns, which seems to have natural discrete atomic elements (see also *luggage, mail*). Even here, context can trigger a continuous measure, witness (i)

- (i) By weight, family A has more {furniture / *members} than family B.

Genuine concrete count nouns do not have this option, regardless of contexts.

- (57) a. John and Lucy’s love/beauty (together) was more love/beauty than Ted could handle. *Nicolas (2002)*
 b. John and Lucy’s beauty was more than Marc could handle.

However, abstract+abstract like *chaos+chaos* is not quite parallel to concrete+concrete (*water+water*): the latter refers to bigger *amounts*, the former to higher *degrees*. As Van de Velde (1995) initially observed, abstract nouns often express *graded properties*, and quantification over such nouns modifies the degree to which the property holds. Surprisingly, this can sometimes give the illusion of a countable meaning even in rigid mass terms. Tovina (2001) points out that in Italian abstracts such as *coraggio* ‘courage’ or *talento* ‘talent’ can be quantified over by the normally count determiner *nessuno* ‘no’ (lit. ‘not-one’). In (58), *courage/talento* pattern with the count noun *amico* ‘friend’, not with *cotone* ‘cotton’. Still, singular universal quantification (**ogni/ciascun coraggio* ‘every/each courage’) remains unavailable.

- (58) Carlo non ha nessun {coraggio / talento / amico / *cotone}.
 Carlo not has no {courage / talent / friend / cotton}

Nicolas (2002) and Jayez and Tovina ((2002):sec 4) observe that in English the singular indefinite determiner can appear with many abstract mass nouns, as long as they are modified by adjectives, especially the word *certain* (59) (see also Hinterwimmer and Umbach 2015 for German). The effect is visible with corpus analyses: while modified singular count indefinites like *a large dog* are about half as frequent as unmodified ones, with mass nouns the ratio becomes 0.69.¹⁷ The effect can be replicated in Italian, with a broader range of adjectives (60).

- (59) He needed a ??(certain) {courage / intelligence / dedication }
 (60) Hai mostrato {un tale / un qualche / un bel} coraggio
 you_have shown {a such / a some / a great} courage
 “You showed {such a / quite some / a great deal of} courage”

(59) is understood as “a certain *degree* of courage/intelligence/dedication”, certainly not as a synonym of “a certain kind of courage”, etc., which would be the expected meaning if *courage* underwent the Kind-shift. Indeed, mass nouns like *tempo* ‘time’ or *spazio* ‘room/space’ which — as noted above for English — seem to fall between concrete and abstract, do not accept a paraphrase with *degree* (61), and do not allow *nessuno* either (62).

- (61) Un (certo / alto) grado di {pazienza / intelligenza / dedizione / *tempo / *spazio}
 A (certain / high) degree of {patience / intelligence / dedication / time / space}
 (62) *Carlo non ha nessun(o) {spazio / tempo} per questo.
 Carlo not has no {space / time} for this

As expected, the adjectives *massimo* ‘maximal’ and *minimo* ‘minimal’, which apply to scales, are not compatible with concrete mass nouns:

¹⁷This count was carried out on the British National Corpus, using syntactic criteria to identify mass nouns. [A-ADJ-Ns] had 340030 non-mass and 29158 mass cases, [A-N] had 680408 non-mass and 425461 mass cases, respectively.

- (63) a. Non ho la minima {paura / preoccupazione / *acqua}
 Not I_have the minimal {fear / worry / *water}
 “I don’t have any fear/worry/water at all”
- b. Qui serve la massima {attenzione / cura / *acqua in questa vasca}
 here one_needs the maximal {attention / care / water in this tank }

Citing Van de Velde (1995), Tovena calls the class of mass nouns that can be quantified over degrees *Intensive Nouns*. Their characteristic is the “possibility of undergoing continuous increase or contraction without a corresponding extension in space or time.” (Tovena, 2002:570). Her proposal is that the degrees of intensity of these nouns provide a “weakly discretized” domain, which is sufficiently atomic to be referred to with specific indefinites, but not enough to be quantified with *every* or counted. The remaining question is why a modifier is needed.

As Tovena and other observed, the modifiers appended to abstract mass nouns often make their degree more specific. Their effect seems in fact similar to the one we obtain with the words *kind* or *amount*, in (64). All objects belong to some kind or other, and all concrete mass nouns come in some quantity, so unmodified *kind* or *amount* are simply too nondescriptive to be used; only the addition of a modifier makes them informative. By the same token, I propose that since all graded adjectives have some degree or other, without a modifier the plain specification that “there is a degree” carries no information.

- (64) a. A ??(strange / certain) kind of thing was on my desk.
 b. Between the two buildings there was a(n) ??(surprising / large / small) amount of space.

The last question to address in this section is whether quantification over abstract mass nouns is *always* over degrees. The problem is that an overt *degree* modifier is not fully acceptable in cases such as (65), except perhaps in highly metaphorical meanings.

- (65) a. ??She knows/studied a certain degree of {chemistry / journalism / research / theater}
 b. ??He has a certain degree of {life / ill-health / advertising / creation} to his credit.

Yet, one can say: *she had studied a lot of chemistry / journalism / research / advertising*, etc. Replacing *degree* with *amount* (which applies to all non-intensive noun: *he spilled a small amount of wine*) notably improves the situation. This suggests that there are abstract mass nouns which are not intensive.

Consider now the quantifier *most*. When used with nouns, it means something like “somewhat more than half” (66).

- (66) a. Most people left.
 b. Most wine is white.
 c. Most criticism is not constructive.
 d. Most research pretends to be applied.

Most can be found with a motley mix of (singular) mass nouns, but in this combination it is quite rare (1884 cases in the *whole* UKWAC corpus, out of 230944 tokens of *most+N*), and the N distribution profile one gets is quite different from what we saw in (25): there are more

concrete mass cases, and more eventive nouns.¹⁸ Interestingly, the corresponding adverb *mostly* cannot apply to graded adjectives (67), unlike the adverbs *very* and *extremely*.¹⁹ Specifically, (67) cannot mean anything like “John’s height is more than half the (mean) height of people judged tall” (compare with *John is somewhat tall*), or “the door is more than halfway closed” (compare with *the door is half closed*).

- (67) a. John is {very / extremely / *mostly} tall.
 b. The door is mostly closed. *only temporal meaning*

This strongly suggests that *most* cannot quantify over degrees. As expected, pairing it with rigid abstract mass nouns which have a strong ‘degree’ component, such as those in (68), leads to ungrammatically (and to unattestedness in UKWAC).

- (68) ??Most {courage / intelligence / dedication / worry / talent / ... }

Should we now conclude that the abstract nouns which do combine with *most* (e.g. *criticism* or *research* in (66)) belong to the same class as *water* and other concrete mass nouns? This position was originally put forth in Levinson (1978), but conceptually, it is rather counterintuitive: canonical concrete mass nouns are well-known for their *undifferentiated* parts, but this does not apply to many abstracts. Water or mud are uniform, research, chemistry and drama are most definitely not. Is there a way to bring out this intuition at a linguistically testable level?

Let’s consider the *proportional partitive* construction (69) ((Falco and Zamparelli 2019)) exemplified in (69).

- (69) Half/Part/Two thirds/20%/Most of DP is P
 (70) a. Half of the boys were underwater.
 b. Most of John was already underwater.
 c. Two thirds of the house were painted green.

When applied to bare mass nouns, this construction tends to select *abstract* cases (Graham Katz, p.c.), yielding a quantification over “aspects” or “constituents” (or, when possible, time subperiods), which is not suitable for concrete masses (72).²⁰

- (71) a. Most/Much of theater is improvisation

¹⁸The list of *Most+N_{sing}* cases with more than 9 tokens in UKWAC comprehends (frequency given before): 10 folk, 10 funding, 10 material, 11 damage, 11 PC, 11 traffic, 11 use, 11 waste, 12 crime, 12 training, 12 value, 13 communication, 13 learning, 13 significance, 14 business, 15 emphasis, 15 support, 17 energy, 18 activity, 18 steam, 19 importance, 19 money, 20 fish, 20 time, 22 food, 24 percent, 31 information, 33 research, 46 software, 48 staff, 49 work, 53 interest, 57 attention, 66 concern.

¹⁹We set aside the meanings *John is tall most of the time*, and the far-fetched *for most of the people you ask, John is tall*. Note that *most* is a maximality operator in *the most intelligent person*, and akin to *very* in *a most intelligent person*. Still, one cannot say: *a most closed door* in the sense “more than half closed”.

²⁰The list of *Most of+N_{sing}* cases with more than 3 tokens in UKWAC comprehends (frequency given before; not cleaned): 312 today, 55 humanity, 50 yesterday, 42 time, 41 history, 39 life, 31 mankind, 30 mine, 29 day, 25 society, 16 em, 15 use, 13 year, 13 wall, 13 interest, 12 Merseyside, 11 industry, 11 everything, 9 way, 7 respect, 7 morning, 7 money, 7 chapter, 6 work, 6 tonight, 6 tomorrow, 6 night, 6 hisstandard, 6 europe, 5 week, 5 science, 5 course, 5 agriculture, 4 return, 4 pre-season, 4 population, 4 page, 4 lunchtime, 4 government, 4 fish, 4 Christianity, 4 art, 4 area.

- b. Much/Half of wisdom is experience.
 - c. Most/Too much of courage is bad risk assessment.
- (72)
- a. ?Most of mud is water.
 - b. ?Much of furniture is wood/chairs

This shows that the behavior of abstract mass terms must really be investigated at all levels. As restrictors, some admit degree quantification (and with it, the modified indefinite article over that degree) much more readily than others. Those that do not begin to look closer to concrete count nouns. But as full DPs (probably kind denoting, as we saw in the previous section), abstracts seem to diverge again from concretes — a remind that we have just scratched the surface of this complex phenomenon.

5 A BECL-based review of mass/count shifts with abstract nouns

In this final section, I will look at the set of elastic mass nouns on a larger scale, using data drawn from BECL 2.0, a recent, large-scale annotation project which lists the countability status and the presence of the Kind or Container shift for 10667 English noun *senses*, extracted from Wordnet and manually annotated by between two and four native speakers (see Kiss, Pelletier, and Stadtfeld 2014b, Kiss, Husic, and Pelletier 2014 for details). In version 2.0, the data are reported only when all the annotators reached agreement. Lemma frequencies from the Open American National Corpus are provided.

In BECL, the decision on how to classify a noun sense in one class or another in the lexicon depends on the outcome of 3 tests. For each of the noun senses of the lemma under investigation, the annotators had to answer the following choices.²¹

- The first test checks whether singulars under the mass determiner *more* are possible.

TI.1 Is it possible to say: NP₁ VERB MORE NOUN[SG] THAN NP₂?
(e.g. *The boy ate more **fruitcake** than the girl*)

If the answer is positive, the annotator is asked to say whether the comparison is based on the amount of matter or the number of items (relevant for *John has more **furniture** than Bill*, as shown in a study by Bale and Barner 2009). VERB could not be *be*.

- The second test aims to detect if a noun can be pluralized, and if this triggers a Kind or Container meaning (the two were lumped together).

TII.1 Is it possible to say: NP₁ VERB MORE NOUN[PL] THAN NP₂?
(e.g. *The boy ate more **fruitcakes** than the girl*)

²¹I ignore other data from the spreadsheet when not relevant for our study. See Kiss, Pelletier, and Stadtfeld 2014b for a full discussion.

If the answer is positive, the annotator checks for the presence of Kind/Container shift by answering TII.2.

TII.2 Is the meaning above equivalent to the meaning NP₁ VERB MORE CLASSIFIER OF NOUN [SG] THAN NP₂? Where CLASSIFIER was “kind” or an appropriate container.

For instance, the annotator answered Yes to TII and TII.2 on the basis of *the man drank more whiskies than the child* and its equivalence with *the man drank more kinds/glasses of whiskey than the child*.

- The third test checks for the availability of the singular indefinite article in copular subject position.

TI.1 Is it possible to say: [INDEF-DET + NOUN-[SG]] IS { SOME PROPERTY OF NOUN }?
(e.g. *a **whiskey** is a glass full of whiskey*)

Note that the indefinite must apply to the *unmodified* noun.

TI.2 Is it possible to say: NOUN-[SG] IS { SOME PROPERTY OF NOUN }?
(e.g. ***Whiskey** is a drinkable liquid*)

Depending on how they reacted to the various tests, noun senses were assigned to 18 (arbitrarily tagged) classes. For instance, class 235 contains rigid count-nouns (no *more*+sing., plural ok, no bare singular), Class 528 rigid mass nouns (bare singular, no plurals at all, unmodified indefinite *a* impossible), etc. Nouns which received negative answers for both TI.1 and TII.1 were identified as ‘unmarked’ for countability in Kiss, Husic, and Pelletier (2014) (i.e. neither count or mass; examples were certain senses of *bias*, *fate* and *tail*).

Given our interest in elasticity, the cases that most concern us here are those nouns which pass TI.1 and TII.1 (i.e. can appear with both singular and plural *more*; *dual-life* nouns, in BECL terminology). If the plural is judged to be due to a Kind/Container shift we have Class 510, with 315 nouns. If not, Classes 726 and 729 (the latter contains only 3 eventive nouns *slaying*, *kidnapping* and *theft* which pass TI.2, i.e. where *more* N is judged to depend on the number of events), for a total of 165 nouns. We can now use as a criterion for abstractness the use of certain abstraction-triggering suffixes, specifically *-tion* (*activation*) *-ity* (*scarcity*) and *-ness* (*happiness*), see Plag (1999).²² The outcome for the various classes is given in Table 5.

The first thing to observe is that the abstract suffixes in our survey are much more frequent in mass senses. In particular, the *-tion* suffix makes up for almost half of Class 726, the elastic nouns whose alternation is *not* due to the Kind or Container shifts. Individual inspection shows that this Class is dominated by nouns (often in *-ation*) which refer to events in the count sense and to generalizations over these events in the mass sense. Examples are:

²²While these are by no means the only affixes producing abstract nouns (cf. *archer-y*, *betray-al*, *annoy-ance*, *orphan-age*, *nation-hood*, *despot-ism*, etc.), the others were either highly ambiguous, or too rare to be attested in the elastic group (*-ism* gave 76 hits in the mass-only group, cf. *more Communism*, but 0 in the elastic categories).

Table 1: Distribution of abstracts with different morphological profiles across BECL classes

BECL Class		All nouns			Morphological Abstracts			
		Lemmas#	Senses #	Sense/- Lemma ratio	-ity	-ness	-tion	Abstract/ Senses Ratio (%)
Rigid	235 (count only)	4968	8025	3,63	63	9	438	6%
	528 (mass only)	1437	1866	1.3	194	135	224	30%
Elastic	510 (Kind/ Container shift)	290	314	1.08	8	6	10	8%
	726 (non K/C shift)	155	165	1.06	5	0	66	43%

(73) absence acclimation accumulation burglary capitalization condemnation confirmation contamination contradiction crystallization decapitation deception decline degeneration detoxification devaluation difficulty diffraction dilation disclosure ...

In some cases the mass sense can in turn take a process reading (words like *capitalization*, *contamination*, *crystallization*, *decline* can be prefixes with *the process of* and can supports predicates such as *can last a long time*). Others (e.g. *difficulty*, *contradiction*) seem to be statives, closer to “notions” (though note that we can replicate Moltmann’s argument apropos the contrast between (35) and (36): *contradiction is common in political speeches* isn’t quite equivalent to *the notion of contradiction is common*). In both cases, the kind analysis discussed in Section 4.2 might be a viable option.

Turning to Class 510 (elastic, with K/C shift), it contains the same rate of abstract nouns as the purely countable Class 235, but a high proportion of names of substances (around 160). Individual examination of their plurals reveals just a few Container shifts (for *ale*, *champagne*, *coffee*), plus something which we might term “Sortal Classifier Shifts” (e.g. *bread/breads* ‘loafs of bread’, *popcorn/popcorns* ‘pieces of popcorn’, etc.). The Kind shift is plausible in about 80 cases, mostly chemicals e.g. *alcohol carbohydrate clay condensate corn cotton cyanide detergent dye electrolyte emulsion ester estrogen ether extract*.²³

Other cases do not properly belong to Class 510. In particular, many substances in the plural seem to refer to idiosyncratic objects which are partially made up of them: *bronze/bronzes* (statues in bronze) *canvas/canvases* (paintings), *copper/coppers* (small coins in British English), *iron/irons* (e.g. for prisoners), *tissue/tissues* (napkins), *timber/timbers* (beams), *tin/tins* (cans), see also *wood/woods*, *speech/speeches*, etc. We do not want to think of this as a productive semantic shift from mass to count, since it is essentially unpredictable which object one ends up with. Neither is the other direction more viable, since this process seems far more lexicalized than Grinding (grinding coppers does not get you the element copper; grinding woods, not only wood). Rather, it seems to be a lexical correspondence which can become an analogical model for other nominal pairs.

As Table 5 shows, mass nouns of all classes have a much lower sense/lemma ratio than count nouns. This might be an artifact of frequency (frequent terms are more polysemous), but it could

²³Yet another class of cases is the systematic relation between a type of tree (e.g. *chestnuts*, *birches*, *hardwoods*, *redwoods*) and their wood (mass). This is a specialized form of the Lewis/Pelletier Grinding-shift (9).

also be the result of working with the (very fine-grained) set of Wordnet senses. If a lemma is elastic, it might be that its count and mass meanings might be attributed to different senses, one of which would end up in the unambiguously count class (235), the other in the mass-only class (528).²⁴ To check this possibility, I looked at lemmas with multiple senses, 460 of which have senses in multiple classes. From this group, 253 have senses both in the “count only” Class 235 and in the ‘mass only’ Class 528 — thus confirming the “split-countability” hypothesis. This group contains many true homonyms (*cricket* the animal, count vs. the game, mass), but also a large number of abstracts (again, the main class in *-tion*, with 48 cases). Conversely, lemmas in multiple classes but with no count meanings (49 cases) are mostly substance-referring.

A final interesting class is that of nouns which refer to human psychological states, like those in (74).

(74) ambition belief concern desire dislike doubt fear hope love suspect thought . . .

In their count senses, these words can refer to the propositional contents of the mental states (i.e. to what I believe, think, fear, hope, suspect, am ambitious about, etc.). They contrast, on the one hand, with personal properties which are not mental states (*ability disabilities skill vulnerability*) and which have count versions that seem to exemplify the general property (‘my disabilities’ are not the things I am not able to do, e.g. fencing, etc.); on the other, with properties such as *courage, alertness, blandness, shyness* which have no count counterpart at all. This suggests the existence of one further semantic shift — from the propositional content to the attitude.

(75) **Attitude-formation:** reference to the mental attitude held with respect to a cognitive or emotional content.
(*object of a mental attitude* ⇒ *mental attitude*)

Still, the *direction* of the shift seems to be quite arbitrary in this case.

6 Conclusions

We navigate a complex world, largely made of cultural object, and we encounter a very big number of terms whose connections with the senses are very indirect, embodied cognition notwithstanding ((Louwerse 2011; Borghi and Binkofski 2014)). Abstract terms arise from this situation, and challenge the strengths of current lexical semantics. While the field has a long way to go before it can start to give a formal account of this largely overlooked area of the content lexicon, it is important to clarify what semantics (as opposed to psychology or philosophy) could be reasonably expected to do on the matter.

In my view, the questions one can raise about the abstract lexicon should be, at this stage, very much linguist’s questions: in what kinds of constructions these terms participate, with which modifiers, with which predicates. Many questions are typological in nature: linguists have been keen to point out the difference in countability across languages for terms such as *pasta* or *hair*, but of course, if countability was a lexical feature like gender, we would expect a much larger

²⁴In some cases, but not in others, the Wordnet annotators separated the event and the underlying process in two senses (for instance *fire* as an event is separated from *fire* as “combustion process”, mass). In general, the sum of the unavoidable idiosyncrasies of the Wordnet and the BECL annotators decreases the consistency of the data.

variation. Nobody denies the existence, in the countability feature, of a broad semantic component which just isn't present in gender beyond relatively few biological cases (see Zamparelli 2008 for discussion). If the analysis stopped at concrete nouns, the fact that *water* is uncountable in all the languages where the distinction is expressed would hardly be surprising. But if we expand it to abstract terms, the comparison becomes a lot more interesting. How come *John has more difficulties* alternates with *more difficulty*, but *more problems* does not alternate with **more problem*? Is it because *problem* does not have the degree argument that singular *more* could modify? If this is so, is there a language which distinguishes “problem” and “difficulty”, but where both have a degree argument? Or where the plural of “courage” expresses the things one is brave in the face of — be they lions or tax inspectors?

This paper attempted a first step in this direction, contrasting abstract terms with other properties and kinds, and mapping the range of productive shifts that languages can employ to move from one meaning to the other. The next step should be, in my opinion, a methodological one: combining intuitions drawn from theoretical linguistic, philosophy, lexicography and corpus linguistics (including distributional semantics), but with a crucial focus on language variation.

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