MUITO IN BRAZILIAN PORTUGUESE AND THE MASS-COUNT GRAMMAR[1]

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RESUMO

Muito, no Português Brasileiro (PB), *é um quantificador massivo: *muito livro-S* (PL), *muita água.* Contudo, ele se combina com o singular nu (SNu): *muito livro.* Pires de Oliveira & Rothstein (2011) argumentam que o *muito* SNu gera leituras massivas; uma evidência de que o SNu é mass, já que nomes contáveis geram apenas leituras cardinais. Beviláqua (2015) verificou experimentalmente se *muito* SNu tem uma leitura massiva. Os resultados não falsearam a predição de Pires de Oliveira & Rothstein (2011), mas os dados não são conclusivos, pois não exclui a possibilidade de que "grinding" esteja licenciando essa leitura. Nós trazemos argumentos teóricos contra essa possiblidade de "grinding", para, depois, explorar a semântico do *muito* SNu. Além do mais, Rothstein & Pires de Oliveira (in press) propõem que a leitura contável do SNu é resultado de "measure" (não "contagem"). Neste artigo, exploramos algumas das consequências disso, em especial um melhor entendimento de massa.

ABSTRACT

Muito in Brazilian Portuguese (BrP) isa massquantifier: **muito livro-S* (PL), *muita*

água. However, it combines with the Bare Singular (BS): *muito livro*. Pires de Oliveira & Rothstein (2011) argue that *muito BS* engenders mass readings; an evidence that the BS is mass, since count nouns can only give rise to cardinal interpretations. Beviláqua (2015) experimentally verified whether *muito BS* has a massreading. The results do not falsify Pires de Oliveira & Rothstein's (2011) prediction, but the data is not conclusive, since it does not exclude the possibility that grinding is licensing this interpretation. We advance theoretical arguments against grinding to further explore the semantics *muito* BS. *Moreover,* Rothstein & Pires de Oliveira (2013) propose that the count reading of the BS is due to measure (not to counting). This paper concludes exploring some ofits consequence, in particular a better understanding of mass.

PALAVRAS-CHAVE

Muito; Plural; Singular Nu; Massivo/contável.

KEYWORDS

Muito; Plural; Bare Singular; Mass/count.

Introduction

In this paper we discuss the by now famous Bare Singular (BS)[3] in Brazilian Portuguese (BrP). BSs are very productive in BrP and they are restricted in the other romance languages, including European Portuguese[4]. Our aim is to deeply investigate the consequences of Pires de Oliveira & Rothstein's (2011) hypothesis that the BS is "mass", i.e. it is derived from a lattice structure where atoms are vague - the stuff, so to say-, and denotes the kind (or the concept) – Chierchia's view on bare nominals in Chinese. According to them, the BS in BrP is just like the bare nominal in languages such as Mandarin. Chierchia (1998) allows the down operator to apply to predicates that are either plural or

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[3] It is not our aim to review the literature on Bare Singular. See Schmitt &Munn (1999, 2001), Müller (2002a), (2002b), among others.

[4] See Dobrovie-Sorin*et al* (2012) for Spanish, Catalan, and Romanian.

mass, i.e. a semi-lattice structure built from (vague) atoms. In Chinese all nouns are mass. The difference between count and mass nouns is not due to different structures but rather to different ways of organizing the lexicon: English is [+arg; +pred], Chines is [+arg; - pred]. Pires de Oliveira & Rothstein (2011) propose a fine-grained parameter, according to which thelexicon in BrP is not the same as in English: English is an either or language, whereas in BS, roots are always available. If this is so, then BrP shares something with several indigenous languages in Brazil: it has a bare nominal (not a Bare Singular, because singular does not mean an atomic count noun). We explore this view in this paper.

The first section briefly reviews Pires de Oliveira & Rothstein claim that the BS *livro* ('book') in *João comprou livro* (João bought book) denotes the kind, and as such is it not derived from a count noun. The authors rely on Rothstein's (2010) formal apparatus, briefly introduced in this section. The prediction is that this sentence is true in a situation where João bought books by kilo or volume, since only mass nouns can have non-cardinal interpretation. The authors claim that this is precisely the case.

Beviláqua's (2015) experiment is presented in the second section. Its aims was to empirically verify the claim that *muito livro* has mass interpretation. The results are compatible with the idea that one may measure an alleged count noun like *livro*. However, these results are not conclusive, because the data can be explained by grinding, a semantic operation that coerces counts into mass. We present theoretical arguments that sustain a distinction between grinding and measuring.

Since our aim is to understand the semantics of *muito*, plurality is an important piece. Plural nouns only have cardinal interpretation, although as shown by Barner & Snedeker (2005) some mass nouns as *furniture* in English may have cardinal readings. The third section discusses the relation between *muito* and *muito*-PL. We argue that the plural morpheme presupposes an atomic domain, i.e. a predicate of type $<e_x d, t>$. This is crucial for us to understand why there are no BSs in English: in English

the count distinction is at the noun level, while in BrP it is morphological (as the plural morpheme, i.e. it is higher up in the derivation). In   the fourth section we explore Rothstein & Pires de Oliveira's (in press) proposal, according to which the root predicate allows for different arrangements of the lattice structures. It is beyond the aims of this paper to present a formal apparatus, we just want to point that it should be possible to count mass nouns, as long as there are units available in the context. Barner & Snedeker (2005) have shown that in English there are some mass nouns that may be counted, the *furniture* noun type. But they have also shown that this is not the case with other types of mass nouns, in particular substances. In English as in BrP, one cannot count water or honey. Thus, at first sight it seems that Rothstein & Pires de Oliveira make wrong predictions. However, Lima (2014) shows that in Yudja (a Juruna language from Tupi stock), one counts honey or water.

In the conclusion, we assume that the mass and count distinction is linguistic, and that the ontological domain is made of stuff. We tentatively propose an explanation for why in BrP it is not possible to linguistically count mass nouns. This will be the opportunity to try to clarify the cross-linguistic picture. BrP, and several other languages around the world, including several indigenous Brazilian languages, may refer to the concept directly. This explains why a bare noun in Karitiana or in BrP or in Chinese may "denote" different instantiations of aKind. English cannot do that directly, it must do it through number; so it has a Bare Plural (BP). But it is also the case that we don't count mass nouns in BrP, and Yudja people do. We briefly discuss Pires de Oliveira, Lima & Rothstein (2014) suggestion that the presence of a classifier system is crucial in the explanation.

1. The "BSs are mass" hypothesis

It is certainly the case that the mass and count distinction surfaces in BrP, as can be attested by the weirdness of the sentences below:

(1)

    a.   # João viu areia-S.[5]
        'João saw sand-PL'[6]

    b.   # Maria comprou duas farinha-S.
        'Maria bought two flour-PL'

One may find contexts where (1.a) and (1.b) are acceptable, i.e. one where different types of a particular stuff, or portions of that stuff. The former is called the "universe sortal", the latter, "universal packager"; but these are mechanisms of coercion which apply to save the derivation. We come back to this issue in the next sections. On the other hand, count nouns are fine without appeal to any sort of coercion:

(2)

    a.   João viu cavalo-S.
        'João saw horse-PL'
    b.   Maria comprou dois livro-S[7].
        'Maria bought two book-PL'

Thus, in BrP mass nouns do not combine with plural morphology (1.a), and cannot be counted (1.b); count nouns can (2a.b.).

Relying on the literature about BrP, Pires de Oliveira & Rothstein (2011) observed that *muito* is a mass quantifier because it combines with a mass noun, engenders non-cardinal interpretations, and is incompatible with the bare plural. These properties are exemplified below. In (3) the most natural interpretation is volume:

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[5] The use of # is to mark that the sentence is not ungrammatical, but rather requires a particular interpretation, arrive at by coercion.
[6] We are only interested in marking the noun morphemes in our glosses.
[7] In BrP, the plural marker is obligatory though it does not have to appear in all the constituents of the noun phrase. We deal with this issue on section 3.

(3)   Tem   muita água nessa reserva.
       There is muito[8] water in this reserve.

(3) is true if the volume of water in the reserveis above a contextual pattern.[9] Crucially it cannot be interpreted as: the number of units of water is greater than the number of units of water that is considered normal. This is expected, since água 'water' is mass and we all know that substances are not "atomic". The literature on cognition has shown that human infants, as young as 3 months, as well as non-humans do distinguish between substance and units (see, for instance Carey (1985), Carey and Spelke (1996) and Barner *et al.* (2008)). Thus, (3) makes perfectly sense. *Muito* is a mass quantifier which measures volume (not unities).

And more, *muito* cannot combine with the bare plural:

(4)   * Tem muita gata-S na   sala.
          have   muito cat-PL in+the room.

Sentence (4) is ungrammatical in BrP. This is expected if *muito* is a mass quantifier: it does not combine with plural nouns.

Pires de Oliveira & Rothstein (2011) predict that if their hypothesis that the BS is mass is correct, then it should compose with *muito*, and give rise to a non-cardinal interpretation. They exemplified the discussion with a "homemade" example. Suppose that we know that João has back problems and he is packing his backpack with one very thick book, and someone comments:

(5)   É   muito livro   pra você carregar.
       It is   muito book   for you   to carry.

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[8] We avoided translating *muito* because it is our object of analysis and there is no one to one correspondence in English.

[9] We assume the common ground semantics for *much*/*many*, where they are quantifiers that state that the degree that something has (according to some scale) is greater than the normal standard. See Mendes de Souza & Pires de Oliveira (2013) for alessnaïve discussion.

They predicted that (5) can be true in such an extreme situation where there is just one object, but it is thick (or heavy). Notice that in this scenario it cannot be the case that the number of books that he has is greater than the normal standard, because he has just one. Whatever is compared, it cannot be the cardinality.

However, it is a consensus that the BS can be used in a situation where more than one individual is involved. Nobody doubts that sentence (5) also has a cardinal interpretation, i.e. it is true in a situation where the number of books that João is carrying is greater than the number of books taken as the standard. There are two issues here: (i) is it really the case that a volume interpretation is available for the BP? Is the sentence true if João has less number of units but they are thicker or heavier? Pires de Oliveira & Rothstein (2011) argue that this is the case. Thus the sentence in (5) can be interpreted by comparing the volume, the weight, and the number of individuals. (ii) How do we account for the cardinal reading if *muito* is a mass quantifier?

Let's first turn to the empirical data.

2. Beviláqua's (2015) experiment and grinding

Beviláqua's experiment was designed to evaluate whether the hypothesis that *muito* BS, exemplified in (5), can have a volume interpretation. In this experiment, the ultimate goal was to verify whether in BrP bare noun phrases behave differently in contexts which made salient the volume or the number of individuals Very briefly, in the task participants were asked to judge the truth of a statement based on visual inputs. The target-sentences, recorded in audio samples to diminish the influence from the written variety, asked about the adequacy (or not) of the sentence to describe the situation in a photography. For instance, the picture in figure 1 was introduced while the participant heard the question *Tem muito livro na sacola?* (Is there much/many book in the bag?), and he had to choose "yes" or "no":

FIGURE 1: Situation 1 for BS *livro* (book)

TEM MUITO LIVRO NA SACOLA?

Verdadeiro   Falso

Accepting the sentence is to be committed to the truth of *tem muito livro na sacola* (there is muito livro in the bag), but since there were only 3 books, the prediction was that the speaker would accept the sentence because he would judge by the volume. Scenarios like those in figure 1 were contrasted with scenarios as the one in figure 2, which was accompanied by the same question. The hypothesis for figure 2 was that the participant would not describe the situation as *muito livro* because the amount of books is not above the pattern which, in this case, is given by the bag, independently of the number of individuals. Here again the speaker judges by volume.

FIGURE 2: Situation 2 for BS *livro* (book)

TEM MUITO LIVRO NA SACOLA?

Verdadeiro   Falso

Thus, if the participants made their judgment based on volume, they should accept the sentence in situation 1 and reject it in situation 2. Participants were instructed before they started. The task was presented in a computer, using php language, and it can be accessed at 'www. roberta.neg.cce.ufsc.br/instrucaotestem.php'.

The graphic below shows the relation between the pair situation/ sentence and the truth judgment of the participant. 93,33% of participants judged true for the pair situation 1 and *muito livro* ('muito book'), while 73,33% assigned "false" for the pair *muito livro* ('muito book') and situation 2 ($\chi2(1) = 55,556$; p = 0.000).

CHART 1: Results of BS *livro* (book), Beviláqua (2015)
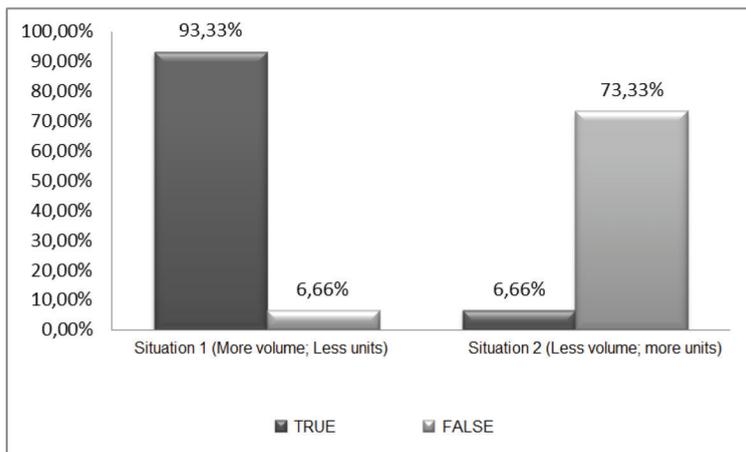
The same pattern is found for *muita bola* ('muita ball'), 66,66% of participants judged true for situation 1, while 93,33% assigned 'false' for situation 2 ($\chi2(1) = 46,507$; p = 0.000), as presented in the chart below:

CHART 2: Results of BS *bola* (ball), Beviláqua (2015)
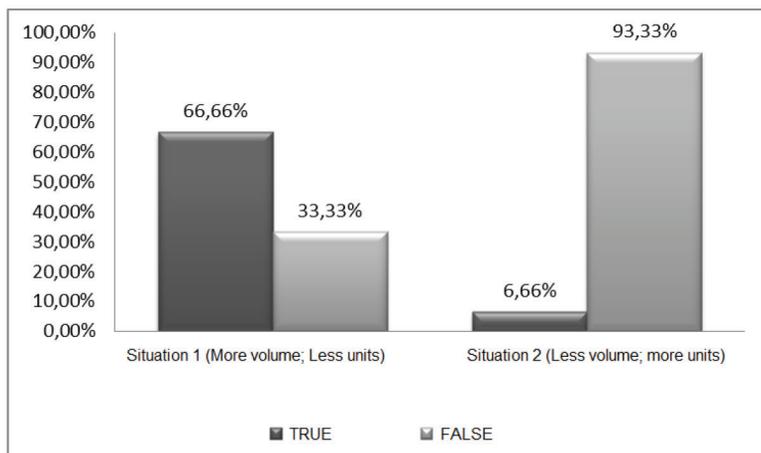
Thus, it seems that there is empirical support for the claim that the BS is mass. However these results cannot be conclusive because they may be explained by grinding.

2.1 Volume or grinding?

English is a well-behaved language, for example: the pair *much* and *many* is clearly sensitive to the count and mass distinction: *many* is a count quantifier, since it must combine with a count noun - * *many water* -, while *much* is a mass quantifier (CHIERCHIA, 1998), because it only combines with mass nouns:

(6)
    a.   Much water.
    b.   *Much books.
    c.   *Much book.

As we know, (6.c) is highly marked; if it is acceptable, it can only be interpreted by grinding. Grinding is an operation, already defined in Link (1983), according to which a count noun is turned into its mass. This operation explains the felicity of:

(7)   There was book all over the place.

Sentence (7) is only true in a situation where there are pieces of book all over the place. This is due to coercion since a count noun *book* is used in a mass syntax. Coercion is certainly the explanation for sentence (8), which is also marked in English:

(8)   # John has more book than Mary.

Here is a possible reasoning: *book* in (8) is a singular count noun, thus it must be about "parts of a singular individual": John has more "parts" of the book than Mary

One could argue that the interpretation of the BS in (5) and the results for volume interpretation found by Beviláqua (2015) are to be explained by grinding, as the English examples in (7) and (8). Although this is certainly something to be empirically checked, we believe that the data in BrP cannot be explained by grinding. First of all, the prototypical sentence for universal grinding, example (7) in English, does not receive in BrP the same interpretation as in English:

(9)   Tinha livro pra tudo quanto é canto.

Sentence (9) naturally describes a situation where there are books (not pieces of book) all over the place; the grinding reading, i.e. one is talking about pieces of book(s), seems to be possible, but very hard to get. The same happens with the translation of (8):

(10)   João tem mais livro que Maria.

First, the sentence is not marked in any sense, as one expects with gridding. Second, both volume and number readings are possible.[10] Third, we may get the grinding reading, but it does require a context where it is interpreted as parts of a book or of books[11], as it also seems to be the case with the English sentence in (8). In BrP, the grinded reading coexists with the volume interpretation. In English, there is only grinding. Volume interpretation is due to measuring a quantity into the volume scale, whereas gridding is an operation that turns an object into the stuff it is made of.

Giving our intuitions concerning the interpretation of the above sentences, we conclude that the volume interpretation for the BS is not achieved via grinding. Suppose we are on the right track. What are the consequences of this view for the nominal system of BrP?

3. *Muito* and *Muito*-PL

BrP has agreement and plural morphology, thus *muito* is part of a grammar where it is in contrast with *muito*-PL. If *muito* is mass and *muito*-PL is plural, we have just met our old friends: *much* and *many*. Unfortunately this is not so! As we said, English is a well behaved language: *much* only combines with mass, see (6), and *many* only combines with plural count nouns:

(11)
      a.   * Many water.
      b.   * Many waters
      c.   * Many book.
      d.   Many books

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[10] For the volume reading, imagine a situation where João and Maria are moving and they packed their books. Maria has 100 very small books. João has only 30 books, but very thick ones.

[11] The gridding interpretation is marked both in BrP and in English, but suppose that one gets into a room where there are pieces of books all over the place.

Thus, in English both *much book* and *many book* are out, and the reason seems to be clear: a cumulative denotation is needed in other to compare, and *book* in English is singular, a non-cumulative predicate, thus it cannot be compared.

The scenario inBrP is less clear. Given what we said so far, the form *muito livro* can be translated by *much book* and also by *many book*. However, this is not the best way of describing the situation, since we are dealing with different grammars. In English, *book* is indeed (semantically) singular, whereas this is not the case with *livro* in BrP, which in this particular resembles bare languages as Chinese, Karitiana, Yudja. But in both English and BrP, the plural morpheme requires individualization (and by consequence atomic sums), which explains why in both languages these phrases only compare the number of individuals. We come back to the cross linguistic issue in the conclusion. For now, let's dig even deeper into the nominal system in BrP.

The literature on number agreement in BrP (See Schere (1988) Scherre & Naro (1998)) claims that plural morphology must be marked at least at the right most constituent in the noun phrase, thus (12.a) is ungrammatical, but all other forms are possible:

(12)
  a.   *Muito livro-PL.
  b.   Muito-PL livro
  c.   Muito-PL livro-PL

Suppose this is so. Thus, we don't expect *muito livro* to be plural, since there is no plural mark. But it does have number interpretation. Consider the two grammatical possibilities of marking plurality, (12.b) and (12.c). There seems to be no difference in interpretation; they are true if the number of units of books is greater than the standard number of books. How do we know that *livro* is plural?

If we trust the data so far, the main difference is *muito livro*, on the one side, and *muito-PL livro(-PL)*, (12.b) and (12.c), on the other; both can be used in counting contexts, whereas only *muito livro* can be used to compare volume. Comparing *muito-PL* and *muito* we arrive at the following generalizations:

(I)   *Muito*-PL compares by number
(II)   *Muito* allows comparison by number and by volume

A straight (and inadequate) solution is to propose that *muito* is ambiguous: *muito-C* where c means count, and *muito-V*, where v means volume. Since there seems to be no lexical restriction to BSs in BrP, in the sense that any lexical item can receive a mass interpretation, that leads to assume that all count nouns in BrP are ambiguous between count and mass: *livro-C* (book) is a count noun, and we have the cardinal reading, and *livro-V* is the mass noun, and the volume reading is allowed.[12] However, the hypothesis that there is a *muito-C* is not economical, and is challenged by the ungrammaticality of (12). If (13) is not grammatical, then we can be sure that plurality is given by the morpheme, and that (12c) is just agreement:

(13)   *Tem   muito   livro-S   na   sacola.
         There is muito   book-PL in+the bag

If *muito* were ambiguous, then it should combine with bare plural nouns, like *livros* in (13). But it does not.

So how can we account for these facts? And what consequences such an account brings about?

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[12] One could imagine that flexible nouns in English, *as baggage* and *rope*, are exactly like that, but this is not the case. There is an important difference: in the count context, English requires plurality. This is not so in BrP, since *muito livro* has a cardinal interpretation.

3.1 BS/BM denote the kind

Contrary to the expectations in the literature, sentence (5), repeated below as (14), may be interpreted as being about the volume (and this interpretation is not achieved via grinding) or about the number of individuals, a count interpretation:

(14) É   muito livro   pra você carregar.
     It is muito book   for you   to carry.

Ambiguity is not a solution. Rothstein and Pires de Oliveira (in press) explored the idea that *livro* may be interpreted as volume or as number because it is derived from a predicate which denotes a lattice structure with vague atoms, as proposed by Chierchia (1998) to the mass denotations. There is no consensus about how to formally account for the notion of vague atoms; thus, it is yet an intuitive description, though we know we need Possible World Semantics. In Rothstein & Pires de Oliveira (in press) approach, they advocate that root nouns denote vaguely in the sense that no unity was defined. Thus, they may be "measure" by different scales.

We follow Rothstein (2010), according to whom the plural morpheme is the expression of the count operation which is a function that maps the pair individual and situation into a unity that counts as 1. Plural Predicates denote atomic sums over complete lattice structures. Thus, the cardinal interpretation is unavoidable.

In our analysis the noun phrase *livro* in (14), the so called BS, is not a plural predicate, rather it denotes the kind (the denotation of the concept) as água in (15), which is derived from the root noun:

(15) É   muita água   pra você carregar.
     It is   muita water   for you   to carry.

The kind is forced to type shift to the root predicate, which is open to different measuring, because comparison forces us to have predicates. Since root predicates are built from vague atoms, they are open to any measurement. No doubts some nouns denote individual entities, as *livro* and *mobília*, so they tend to be compared by units. Thus, we expect that the most natural interpretation for these nouns is the unity interpretation, as is clearly the case with *livro* and empirically verified to be the case with the so called atomic mass nouns as *furniture* (Barner & Snedeker (2005), and Beviláqua (2015) for BrP). Substances are not normally compared by units; thus, in (15) we don't normally get the unity reading, what is at stake is the volume. But the prediction is that given a context where the substance is presented in portions it would be possible to have the unity reading. We come back to this issue in the conclusion.

Since root nouns do not have a pre-defined unity, the individuals may be mapped to different scales. Thus, the volume reading of (14) is a consequence of the presence of the kind, which is built from the root predicate that is open to different measurement. Root nouns are "undefined", so they may have both volume and cardinal interpretations.

The plural morphology in the BP warranties that the only possible interpretation is "counting" the individuals (1, 2, 3, 4…) because plurality pairs an individual and a unity. The counting reading with the BS is achieved via "measuring" an amount of individuals into a cardinal scale. The result is the same, not the meaning. Rothstein & Pires de Oliveira (in press) claim that "counting" and "measuring" are different operations: "counting is putting entities in one-to-one correspondence with the natural numbers, whereas measuring is assigning an overall quantity a value on a scale".

If this is the case, then it should be possible to measure substances using the cardinal scale, the topic of the next section.

4. Mass nouns

The bare mass in BrP behaves as English mass phrases, i.e. it does not combine with the plural:

(16)
      a. *   Muita-S água
      b. *   Muita-S água-S
      c.   Muita água

The hypothesis is that água (water) in (16.c) also denotes the kind and is shifted to the root predicate, which denotes a lattice built from vague atoms. This is pretty much the picture that Chierchia (1998) offers for mass nouns. If this is so, and if it is the case that *muito* is underspecified with respect to the scale, then we expect that it is also possible to map water into a scale that has unities, in the same way it is possible with *livro*.

Thus, on the one side, we expect languages that count mass nouns, a prediction that is banned in the literature - mass nouns cannot be counted is the mantra! It is true that substances are not composed of natural unities and one could justify the inexistence of the unity reading for mass nouns due to its natural properties, as Rothstein (2010) and others suggested. Nouns as *furniture* can be counted because they have natural units. But if there are units in the context, what would block such a possibility for substances? Why we do not normally count water? Isn't a drop a natural unity? The prediction is that this is indeed possible, and it happens in some languages. Lima (2014) argues that Yudja is such a language. In Yudja it is possible to count mass without any classifier, as exemplified below:

(17)   txabïu uda   awïla wï
         'three someone honey bring'
         'Someone brought three (portions of) honey'

If a count reading is available for the root noun *livro*, one expects that is it also available for root nouns that denote substances as *areia* ('sand'). This is the mirror situation of the volume reading of BS; so one has to check whether the counting of substances is not due to coercion via packaging. This was not done yet for BrP. But Gomes & Lima (2015) found some preliminary results for BrP that confirm that it is possible to "count" mass the same way we "count" books in *muito livro*. The idea is that one can felicitously use (18) to describe a situation where the number of units of sand in a context is greater than the number of units of sand in the other relevant situation, given that the volume is the same:

(18)   Essa sala   tem mais   areia que aquela.
       This room has more sand than that.

Suppose this is so, then we have support for the hypothesis that "Bare" bare nominals, i.e. nominal without determiners and without any morphology, as they happen in Chinese, Karitiana, Yudja and BrP, denote the root noun. This explains the similarities between such different languages. But now we have to come back to our first example and explain why one cannot say (1.b) in BrP, repeated here as (19) for convenience:

(19)   # Maria comprou duas farinha-S.
        'Maria bought   two   flour-PL'

The literature claims that (19) may be interpreted as types of flour – white flour and integral flour – or packaging: two conventionalized packages of flour. This leads us to our last section where a cross-linguistic perspective is proposed.

5. Across languages, some remarks

In their 2011 paper, Pires de Oliveira & Rothstein advance the hypothesis that English does not have the BS, only the BP, because it is an either/or language, that is a noun is either count or mass, and once a count operation is performed on the root noun, it is no longer available for other operations, for instance the down operator to generate the kind. They suggested that there languages where the root noun is always available, as BrP and Chinese; in these languages the root noun is always available, allowing structures like the BS in BP. But, as discussed in Pires de Oliveira (2014), these are also very different languages, since BrP has the plural morpheme which forces the distinction between plural and non-plurality. Chinese, on the other hand, has a very complex system of classifiers, which does not seem to match our binary distinction between plural and root.

This hypothesis allows us to see the similarities between BrP and Yudja when the nouns are bare, but it does not account for the difference between them, i.e. it is not possible to directly count mass in BrP, as exemplified in (19). Pires de Oliveira, Lima & Rothstein (2014) suggest that the difference may be explained by the classifier system. BrP has a classifier system that is obligatory in order to count substances. The consequence is that if (19) is possible it is through coercion: the data is reanalyzed so that units are provided via a hidden classifier, that we know it is there, because there are classifiers in BrP. Yudja has no classifier system, and no number morphology; thus the bare noun phrase is its only resource (Yudja is barer than Chinese, in this respect).

Thus it is fine to count substances, given that there are units in the context; no coercion is involved. This is a hypothesis that is still under investigation, built as part of a castle the foundations of which are still very shaky; to say the least we lack a formal definition of vague atoms. No doubts much more investigation is needed, but we hope to have contributed to clarifying the mass hypothesis in Pires de Oliveira & Rothstein (2011).

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