

What do Bare Nouns mean cross-linguistically? Preliminary results

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Summary

This paper presents a crosslinguistic investigation of the semantics of bare nouns in comparative construction, which is considered the best test to assess the mass/count distinction (Bale and Barner (2009)). It presents preliminary results of three tasks: (i) Acceptability test; (ii) a picture matching; and a (iii) Quantity-judgment (Barner and Snedeker (2005)), all of them applied to four languages: English, Brazilian Portuguese (BrP), Cabo Verdean (CV), and Spanish. English is our point of departure because it is better understood (Barner & Snedeker, 2005, Chierchia 1998, 2010, among others, Rothstein 2010, 2016, among others). The results show that these languages distinguish mass and count. English and Spanish behave alike: the acceptability of the Bare Singular is low, and its interpretation (always partitive) indicates that it is an atomic predicate. Moreover, the distinction between Bare Singulars and Flexible Nouns finds empirical support in these two languages. Thus, they seem to be number marking languages, according to Chierchia's (2010) typology. By contrast, the Bare Singular in CV is well accepted, and it behaves exactly like the Bare Plural; that is, it is a plural noun. Moreover, the distinction mass and count seems to be strict, as we explain later. Thus, CV might be a number neutral language (as suggested by Pires de Oliveira and Martins (to appear)). The Bare Singular in Brazilian Portuguese, in turn, remains a puzzle, since it shows a "hybrid" behavior between volume and number interpretations. These results do not support, however, Rothstein and Pires de Oliveira's (in press) hypothesis that the Bare Singular in BrP is a flexible noun. The distinction between Bare Singular and flexible nouns finds no empirical support in BrP nor in CV. In the conclusion, we point towards an explanation for BrP.

Theoretical Discussion

Although the mass and count distinction is a big issue in contemporary semantics, it is common ground that there are languages, such as English, that grammatically distinguishes mass and count nouns (Link, 1983; Bunt, 1985; Chierchia, 1998; Rothstein, 2016). In these languages, mass nouns do not accept plural morphology nor combine with numerals, and only raise volume measurements in comparison. Count nouns, on the other hand, only raise a cardinality measurement¹ and cannot appear in a mass syntax, unless it as a Flexible noun. Flexible nouns are ambiguous, a position shared by Chierchia (2010) and Rothstein (20017), though the formal systems are very different. We come back to this issue in the conclusion. Thus, *stone* in the sentence (1a) is mass, but *stones* in (1b) is a plural count noun, so it is true about the number of individual stones, the cardinal reading. Only a bunch of items are flexible and in principle they could be learned one by one.

- (1) a. This garden has more **stone** than that one. (only mass reading)
b. This garden has more **stones** than that one. (only cardinal reading)

Sentence like in (2a) with a bare singular count noun are ruled out in English (Chierchia 1998). If forced into a comparison structure, it is shifted either to its substance, as in (2b) (Link, 1983)) or, according to Chierchia (2010), it is rescued via partition of the object:

- (2) a. John has more houses than Peter. (number reading)
b. # This salad has more apple than that one.² (grinding reading)
c. # John has more house than Mary. (partitive reading)

Our experiment verifies the predictions with respect to the sentences in (1) and in (2a) and (2c). The literature (Pires de Oliveira & Rothstein, 2011) shows that BrP is quite different. The Bare Singular

¹ *Furniture* allows for cardinal interpretation but syntactically it behaves massively. There is no consensus in the literature on how to treat these nouns. We will not discuss the issue here.

² See Frisson and Frazier (2005) for empirical support that this is result of coercion.

is acceptable and is polysemous: cardinal, volume (Beviláqua and Pires de Oliveira, 2014; Beviláqua, 2015), and partitive readings. Thus, *casa* (house) behaves as mass (as predicted by Pires de Oliveira & Rothstein, 2011) and as count:

- (3) a. João tem mais casa que Pedro. (cardinal/volume/partitive readings)
John has more house than Peter.
b. Esse jardim tem mais pedra que aquele (volume/cardinal)
This garden has more stone that that

Neither the BS in (3a) nor the allegedly flexible noun in (3b) behave as the flexible noun stone in (1a). *Pedra* (stone) in (3b) may have a cardinal interpretation. Beviláqua and Pires de Oliveira (2014) argue, relying on experimental data, that the distinction between flexible nouns and bare singulars does not find empirical support in BrP; i.e. (3a) and (3b) are indistinguishable.

Rothstein & Pires de Oliveira (2016) argue that (3) is explained if the BS in BrP is a Flexible noun. They argue that, in English, the cardinal reading of (1a) is pragmatically blocked because of the co-existence of the BP in (1b). If this is so, then it should be possible to manipulate the context so that one gets a cardinal reading. The hypothesis is that the BS in BrP behaves as the Flexible noun in English. Moreover, Cyrino & Espinal (2011) argue that the BS in BrP is like the BS in Spanish; if this is so, they should behave the same way in comparison. Finally, Pires de Oliveira and Martins (to appear) argue that CV is a number neutral language; thus, we predict that it does not behave as English. In the next section we present the preliminary results of three tasks the aim of which was to verify these predictions.

Experimental Methodology

The three tasks were web-based using the ‘onlinepesquisa.com’ platform. Task 1 is an Acceptability task; the aim is to verify the acceptability of the bare noun phrases in comparative structures. The independent variables are Noun Phrase and Language. Our point of departure is English. The Noun Phrase has 5 levels: Bare Count Singular Noun (BS); Bare Plural (BP); Flexible nouns in a singular form (FLEX-SG); Flexible nouns in a plural form (FLEX-PL); and Mass nouns (MASS). Substance mass nouns is the control, since the prediction is that they are invariably measured by volume across languages.³ The task had 15 target sentences, 25 distractors. The dependent variable is a 7-point ordinal Likert scale to rate the participants’s evaluation of the naturalness of the sentences. We tested 9 native speakers of English, 10 native speakers of Spanish, 6 native speakers of CV, and 15 native speakers of BrP. Given the literature, the BS should not be natural in English and Spanish, and should be acceptable in BrP and CV. If the literature is right, there is a contrast between Flexible and the BS in English and Spanish. BPs are fine in English, Spanish, and BrP, but it is marked in CV, according to Pires de Oliveira & Martins (2017). Beviláqua & Pires de Oliveira (2014) predict that the distinction between Flexible Nouns and the BS does not find empirical support in BP nor in CV.

Task 2 is a picture-matching activity designed to explore the interpretation of nouns in comparatives. After reading a sentence, the participant chose one or more scenarios that she/he believe are depicted by the same sentences from task 1. The objects in the scenarios were contrasted by: (i) number (for instance, two houses versus three houses); (ii) by volume (a big house versus three small houses); and by parts of the object (one house divided into two parts of different sizes). The dependent variable is the answers. The independent variables are those of task 1. The same participants answered tasks 1 and 2. Chierchia (2010) predicts that, in English and in Spanish, the BS gives rise to a partitive reading. There is then a contrast between Flexible and the BS in these two languages, since flexible are interpreted only by volume. For BrP and CV, the prediction is that there is no distinction between the BS and Singular Flexible Nouns. However, if Pires de Oliveira and Martins (2017) are right, the BS in CV is interpreted by cardinality only, whereas it will have different interpretations in BrP. If Rothstein and Pires de Oliveira (to appear) are right, the BS in BrP should

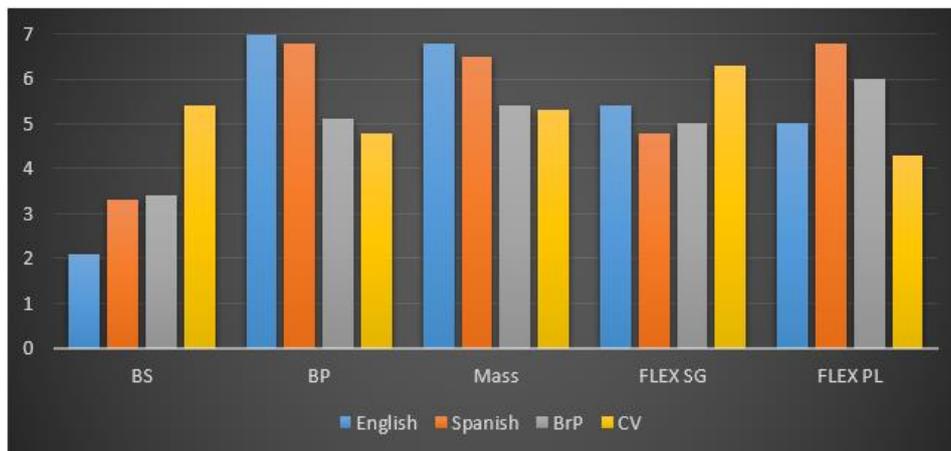
³ This is true for Yudja since the volume interpretation is available. The issue in Yudja is the cardinal reading of substance mass nouns. We will not deal with this issue in this paper. See Lima (2015).

behave as Flexible nouns in English, in particular Flexible Nouns in English should give rise to cardinal interpretations.

Task 3 explores quantity judgments (Barner and Snedeker, 2005). The participants had to choose between two pictures while reading a ‘who has more X?’ question. One picture always had three small objects, while the other had one big object of the same kind. The objects that outnumbered were smaller in volume and in surface area, allowing judgments based on number to be distinguished from those based on volume (the one big object). The independent variables were the same as those of tasks 1 and 2. 5 native speakers of English, 5 native speakers of Spanish, 3 native speakers of CV, and 9 native speakers of BrP participated in the pilot. Following Pires de Oliveira and Rothstein (2011), we expected that the BS in BrP and flexible nouns in English are indistinguishable.

Results

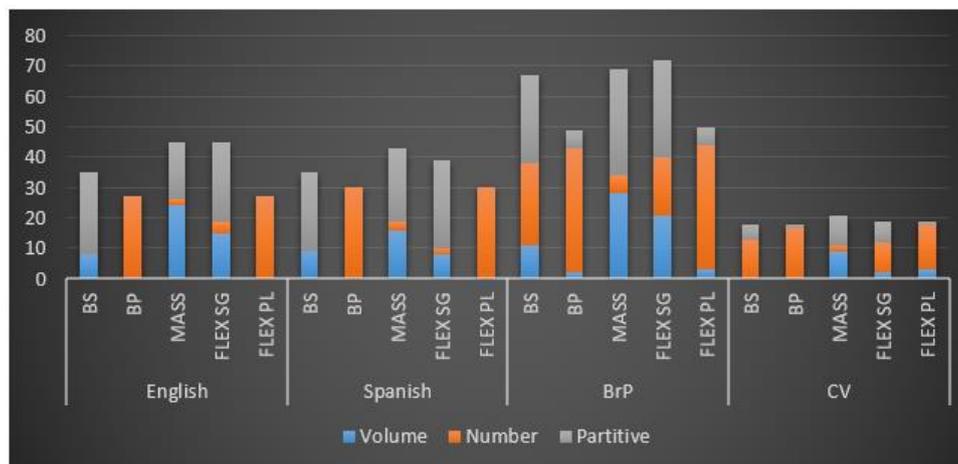
The preliminary results of the Task 1 are in the graphics below.



Graphic 1. Results of the Acceptability test – Means (1 – 7 point scale)

For English, as expected, only sentences with BS nouns were low rated, indicating a mismatch between the count noun and the mass syntax. Notice the contrast between the BS and the FLEX SG in English. The same pattern is found for Spanish: BS nouns were also the only ones low rated; there is a contrast with respect to FLEX SG. For CV, the bare plural and plural flexible nouns were the lowest rated noun phrases. There is no significant difference between FLEX SG, and BS. They are well rated. But Plurals nouns in CV are acceptable, which is an unexpected result. For BrP, all the sentences were medium rated, and BS nouns were the lowest rated one, also an unexpected result. We come back to this issue in the discussion.

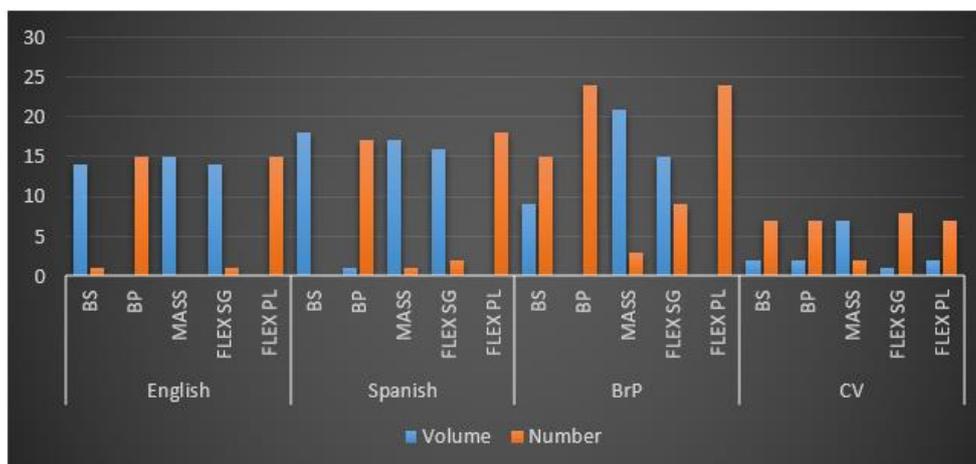
The results of the Task 2 are presented below:



Graphic 2. Results of the Picture-matching test

English singular flexible nouns and notional mass nouns behaved the same way, participants chose both volume and/or partitive readings. For bare plural and plural flexible nouns, participants chose only the cardinal scenario. For BS nouns, participants chose only the partitive reading. Flexible nouns in a singular form behave like mass nouns. The plural form is just like ordinary plural count nouns, only cardinal readings are activated. The same pattern is found for Spanish. For BrP, the BS has volume, partitive, and cardinal interpretation, in contrast to the BS in English and Spanish. Flexible nouns behave like BSs. Flexible Plural are Bare Plurals and they are interpreted by cardinality. In CV, the BS, the Flexible singular are only interpreted by number, as the BP and the Flexible Plural. There is no difference between the noun phrases in CV.

The results of the Quantity-judgment task are presented below:



Graphic 3. Results of the Quantity-judgment test

These results confirm those of Task 2. For English and Spanish: BS; mass and singular flexible nouns were measured exclusively by volume dimensions. Bare plurals and plural flexible nouns were compared by cardinality. For CV, BS, bare plurals, plural and singular flexible nouns were compared by cardinality, while mass nouns were judged by volume. For BrP, BS and FLEX SG allowed quantity judgments based both on volume and cardinality. Mass nouns only on volume; and plural flexible nouns and bare plural nouns only on cardinality.

General Discussion

The aim was to empirically verify a number of predictions concerning bare nouns across four languages fixing the structure to comparatives. Comparatives allow us to see that, the interpretation of the Bare Singular, and of the Singular Flexible Nouns vary across these languages, both in the grammaticality and in the interpretation, whereas the Bare Plural is stable, and substance mass nouns were taken as control, assuming it was stable cross linguistically.

Theoretically, the results support the claim that in English and in Spanish, the Bare Singular is marked in mass comparatives and it is an atomic predicate; if in mass context it gives rise to a partition of the object. The literature claims that this is due to coercion; our experiment supports this hypothesis when the results of the acceptability task are combined with those of tasks 2 and 3 which deal with interpretation. In English and Spanish, the sentences with the bare count singular nouns were low rated, if we force an interpretation, it is a partition of the object. Flexible Nouns are acceptable in mass syntax and they are interpreted massively. The prediction is that the partition reading takes longer to process than the other noun phrases, in particular longer than Flexible Nouns. Thus, they seem to behave as number marking languages (Chierchia, 2010).

In Cape Verdean, the both the Bare Singular and the Bare Plural are highly rated (against Pires de Oliveira & Martins, 2017). However, it seems to be a consensus in the literature on Cape Verdean (Baptista, 2007) that the Bare Singular is the default noun phrase; if there is a bare plural, it is restricted to some nouns (human nouns). We believe that these results might be due to the design of the experiment which compared the singular and the plural in the same task. Since the expression of plurality in those languages are not obligatory, its use raises implicatures which might be interfering. The effect could be a raising of acceptance for the plural form. Moreover, European

Portuguese might be interfering with the judgment in Cape Verdean. We plan to modify the design of the experiment. There is a rigid distinction between Bare Singular and Bare Mass in this language, comparable to the distinction between the Bare Plural and the Bare Mass in English. These might be indication that the distinction count versus mass is lexically given in these languages. However, the notion of flexible nouns does not seem to make sense in Cape Verdean, as was predicted, though it does in English and Spanish. In CV, the morphological mark of plurality is not obligatory to express cardinality. These are empirical evidences that these are two types of languages: English and Spanish are number marking languages - bare singulars are marked in mass syntax because they are atomic predicates -, and CV is number neutral - bare singulars are argumental and they are plural predicates (Pires de Oliveira & Martins, 2017).

Unexpected, the BS in BrP was poorly accepted. As with CV, we believe this is due to the methodology of the task which compared the plural versus the singular in the same task. Marking morphologically the plural is associated with the norm of prestige in Brazil, being evaluated as the right way to speak, thus, the task might have induced the participants to under-rated the singular form. We plan to review the task. The results of tasks 2 and 3 replicate those already found in the literature on BrP: the Bare Singular is interpreted by number of individuals, by volume, and by partition. This seems to show that the Bare Singular is neither mass (against Pires de Oliveira & Rothstein, 2011), nor plural (against Müller, 2002). Rothstein & Pires de Oliveira (in press) predicted that the BS in BrP should behave as singular Flexible Nouns in English, but the results do not support this claim. In particular, only the BS in BrP allows for cardinal reading. If there is a pragmatic ban that does not allow the cardinal reading of the flexible noun in English, it should apply to BrP, since it also contrasts with the Bare Plural. But the results show that this is not the case. Moreover, the distinction of flexible nouns as a natural class finds support in the English data, but it does not in BrP, where there is no significant difference between BS and Singular Flexible nouns. Finally, the interpretation of these nouns phrases, the Bare Singular in BrP and the Flexible singular in English, are not the same. Thus, our data does not support Rothstein & Pires de Oliveira (in press).

Conclusions

The main conclusion is that what may be described as bare count singular noun is not evaluated in the same way across these languages and does not have the same interpretation either. This may be an indication that Bare Singulars are a very efficient way of taking a first look at the nominal system of a language, precisely because it is a place of variation. The Bare Plural, by contrast, seems to be very stable across the languages we have investigated. Flexible nouns seem to be associated with languages as English and Spanish which, we suggest, are number marking.

Based on these preliminary results, one of the findings of this experiment is that English speakers do not base quantity judgments on number for flexible nouns when they are presented in a mass syntax. An evidence against Rothstein and Pires de Oliveira's (to appear) hypothesis. If this is so, flexible nouns in English cannot be treated as a small sample of BrP BS.

Also, our results indicate that while BS readings are derived from coercion in English, this is not the case for BrP. The data conforms to Chierchia's analysis (2010) of English according to which the BS is an atomic predicate. Both the partitive and the volume readings are derived via coercion from count to mass. BSs in CV, on the other hand, are well accepted and only interpreted by cardinality. The results give support to the claim that CV is not a number marking language; it may be number neutral (Pires de Oliveira & Martins, to appear).

BrP, however, remains a puzzle. Given the theoretical frame developed in Chierchia (2010), it does not seem to behave as English and Spanish nor as CV, because the Bare Singular has count and mass readings. Scontras et al. (2017) claim that there are two outliers to the generalizations about mass and count across languages: Yudja where notional mass nouns can be counted, and furniture type of nouns in English because they are syntactically mass but interpreted as count nouns. BrP is another outlier. We do not have an explanation for BrP yet, but we believe that bare singulars in BrP behave just as the same as the "no-noun" condition, lacking any morphosyntactic cues, then being truly underspecified with regard to atomicity.

This paper shows that empirical researches across languages is not only a good method of testing theoretical hypotheses, but it also allows a better understanding of the data and the construction of new predictions. The results of our experiment make several predictions including

predictions about the processing of semantic information. It shows that if we look at the behavior of the Bare Singular in a particular language, we may grasp what sort of language we have and have a clue about how it works.

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