

## Quantifying over bare nouns: evidences from an experiment

This paper discuss the denotation of the bare nouns in Brazilian Portuguese (BrP). We investigate the role of the mass-count distinction when bare nominal phrases appear under the scope of quantifiers, focusing on the bare singular (BS) quantified structures with ‘muito(a)’ (much). As first appointed by Pires de Oliveira & Rothstein (2011), bare singulars (BSs) appear with mass quantifiers generating a context in which volume scales are used:

- (1) 

Tinha	muito	livro	na mochila. (cardinal; volume)
have.PST.IPFV.3PS	much-SG	book-SG	in-the bag

Thus, (1) can be used to on the volume or weight of the quantity of book(s) that someone is carrying. The sentence may be true even if he has only one or two books, provided that the books are thick or heavy, which is too much for someone to carry. Moreover, (1) may be also true in a situation where someone talks about the cardinality of the set of books, i.e. a comparison in which a cardinal scale is used. The discussion in the literature about BSs is not consensual. Schimmt and Munn (1999), Müller (2002), Munn and Schmitt (2005), among others, claim that BSs are number neutral count nouns and not semantically singular, which could explain why we have cardinal interpretations in sentences like (1). Instead, Pires de Oliveira & Rothstein (2011) argue that BS are not number neutral nouns but mass nouns, and then we expect mass interpretations in the context of (1). How should we treat BSs then? Are the two scales of comparison in fact available for sentences like (1)? In addition, if we take a look at others bare nouns in BrP, a pattern seems to emerge, fake mass nouns – Chierchia (2010) – and flexible nouns – Barner and Snedeker (2005) - are also compared using both cardinal and noncardinal scales:

- (2) 

João tem	muita	mobília (cardinal; volume)
John have.3PS	much-SG	furniture-SG
- (3) 

João tem	muita	corda (cardinal; volume)
John have.3S	much-SG	string-SG

In order to have a better understanding of the role of the mass-count distinction when bare nominal phrases are used under the scope of the mass quantifier ‘muito’ (much), we developed an experiment using the method of truth-value judgment. The test investigated the possibility of bare singulars, fake mass nouns and flexible nouns allowing mass or count judgments when appear in the target sentence “Tem muito X?”. 60 participants were shown two photos and were asked to answer between “True” or “False”. One photo always held two or three large objects (situation 1) while the other had four or five small objects of the same kind (situation 2). We used fillers and the photos were randomized and did not appeared at the same time. In this paper, we present the first results.

For bare singulars (‘bola’ (ball)) the participants judged “true” for 93,33% the situations 1; and 73,33% the participants judged “false” the situations 2. For the bare singular term ‘livro’ (book), the participants judged “true” for 66,66% the situations 1; and 93,33% the participants judged “false” the situations 2. For fake mass nouns - ‘roupa’ (clothing) - the participants judged “true” for 60% the situations 1; and 86,66% the participants judged “false” the situations 2. For flexible nouns - ‘pedra’ (stone) - the participants judged “true” for 70% the situations 1; and 96,66% the participants judged “false” the situations 2. The results have shown that these nouns behave in the same way: BSs, flexible nouns and fake mass nouns raises judgments based on volume and number when appear under the scope of the quantifier ‘muito(a)’.

Thus, the experiment allow us to make some remarks: based on the arguments of each theory for BSs, we reasoned that BSs cannot be number neutral count nouns, since it raises volume judgments. The fact that BSs are compared by volume is unexpected and there is no explanation for this by a number neutral theory. These results are best explained if we adopt the mass theory. According to Pires de Oliveira & Rothstein (2011), bare singulars are mass and since then we can expect a mass behavior in quantified sentences. With respect to crosslinguistics issues, flexible nouns in English show a different behavior:

(4) John has too much string (\*cardinal; volume)

In (4), flexible nouns appear to interpret mass syntax uses (much) as only quantifying over volume. This lead Bale & Barner (2009) to generalize that “No term that can be used in count syntax can also be used in a mass syntax to denote individuals.” Note that Bale & Barner (2009)’s generalization cannot be sustained for BrP, given the behavior of the so-called bare nouns in quantified sentences, as we saw in (1) to (3).

In that sense, we suggest that there are no need to posit the existence of flexible nouns in BrP, since nouns like *stone* allowed count and mass judgments under the scope of ‘*muito*’, as bare singulars. How do we explain this crosslinguistic variance? The behavior of flexible nouns in English indicate that syntactic information is employed in forming their semantic mass-count judgments. Contrary to BrP, in which a non-count syntax is default, English has an specialized syntax: either it is a count syntax or there has to be a mass syntax. The choice of count syntax restricts the interpretation exclusively to count (as a plural mark or a count quantifier like ‘many’). Since a mass syntax is selected, it is not the case that we can have a count reading then the syntax restricts the interpretation to mass.

In brief conclusion, this paper discussed the interpretations that nouns have in quantified clauses and the relation of them with the theories about the denotation of bare nouns. We developed and experiment to have an empirical analysis on the survey about the behavior of bare nouns under the scope of expressions like *muito* (much). The results can be explained assuming as Pires de Oliveira & Rothstein (2011) that the bare singular is a mass predicate. The paper also discussed the behavior of flexible nouns and showed that Bale & Barner (2009)’s generalization cannot be sustained. We explained the differences between English and Brazilian Portuguese from the hypothesis of syntatics restrictions. For the last, we wish to develop a semantics for the nominal comparison, arguing that the dimension of measurement can be predicated from the denotation of the noun.

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