

# Number neutral amounts and pluralities in Brazilian Portuguese<sup>\*</sup>

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## *Abstract*

*The main goal of the paper is to elucidate the notion of ‘number neutrality’ in such a way that we can account for contrasts between bare plurals and number-neutral count bare nouns in Brazilian Portuguese.*

## **1. Defining number-neutrality**

Examples such as (1) are built with count nouns that lack any determiner or number-marking, labeled ‘count bare nouns’ (CBNs)<sup>1</sup> henceforth:

- (1) Eu vi criança na sala.  
I saw child in-the room  
‘I saw a child/children in the room.’

Such bare nouns exhibit a ‘number-neutral’ interpretation, in the sense that they do not constrain the cardinality of the entity they denote: the predication in (1) is satisfied by situations that contain more than one child or just one child. According to Munn & Schmitt (1999, 2005) and Müller (2002), the CBNs can be resumed by either a singular or a plural-marked anaphoric pronoun; thus, both (1’a) and (1’b) are reported by these authors as possible continuations of (1):

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<sup>1</sup> This label was used by Müller (2002); most of the literature devoted to count nouns that are not marked as plural use the label ‘bare singular’, which is however misleading, since these nominals are not interpreted as singular.

- (1') a. E elas estavam ouvindo.  
and they were listening  
'And they were listening.'
- b. E ela estava ouvindo.  
and she was listening  
'And she was listening.'

Note however that this judgment is not unanimously shared by speakers of Brazilian Portuguese. The people mentioned in the introductory note of this paper strongly prefer (1'a), where the pronoun that resumes the CBN is marked as plural. The following example and acceptability judgments are due to Sergio Menuzzi:

- (2) *Ontem, quando cheguei na casa do João, vi criança brincando no pátio.*  
'Yesterday, when I entered João's home, I saw child playing in the backyard'.
- (2') a. *Elas 'tavam fazendo a maior bagunça.*  
'They were making a hell of a mess'.
- b. ?? *Ela 'tava fazendo a maior bagunça.*  
'She was making a hell of a mess'.

The different acceptability judgments shown in (1'b) vs (2'b) may be due to dialectal variation, but they may also be due to the fact that some speakers, but not others, feel that accommodation is needed in (2'b): the unmarked interpretation of a CBN would be 'plural (entity)', but the use of a singular pronoun in the subsequent discourse may be allowed, due to accommodation, in case the cardinality of the plurality in the described situation happens to be 'one'.

The data in (2)-(2') shed some initial doubt on the way in which both Munn & Schmitt (1999, 2005) and Müller (2002) characterize the number-neutrality of CBNs:

- (3) Number-neutral CBNs have both atoms and pluralities in their domain of denotation.

If the domain of CBNs contained atoms, there should be no problem for resumption by a singular pronoun.

Note now that under the characterization in (3), the interpretation of CBNs is identical to Link's (1983) analysis of bare plurals (BPs henceforth), presented in section 3 below. In order to distinguish between BPs and CBNs, Munn & Schmitt (1999, 2005) and Müller (2002) assume (contra Link, 1983) that in the Lexicon, count nouns denote sets that contain both atoms and pluralities, the contribution of plural marking being to remove the atoms from that set.

However, if the judgment in (1'b) is questionable, there is no clear contrast between BPs (which can only be resumed by plural pronouns) and CBNs regarding the (im)possibility of singular marking on anaphoric pronouns, so that we might after all assume the same analysis for BPs and CBNs: both types of bare nouns would have atoms in their domain of denotation, in addition to pluralities. Note indeed that in languages that do not have CBNs, the example in (1) would be translated by a BP. There are, moreover, some other well-known similarities between BPs and CBNs. Thus, (i) both BPs and CBNs in object positions trigger atelic readings (see (4a)) and neither of them allows wide scope construals (but counterexamples exist, an issue to which we will come back later, in section 5), in particular they are interpreted as narrow-scoped with respect to negation (see (4b)):

- (4) a. João leu revistinha(s) (\*em uma hora).  
 John read comic book(s) (in an hour).  
 b. João não lê revistinha(s).  
 John not reads comic book(s).

This analysis is however problematic, because it cannot account for a number of important contrasts between number-neutral CBNs and BPs, which will be introduced in section 2 below. The alternative proposal made in this paper can informally be described as in (5):

- (5) Number-neutral CBNs refer to cumulative entities (amounts of objects).

## 2. Differences between BPs and number-neutral CBNs

### 2.1 Collect vs. Compare

Dayal (2007) observed in relation to Hindi and Hungarian that certain plurality-selecting verbs, e.g., *compare*, allow BPs but do not allow number-neutral CBNs, in contrast with other plurality-selecting verbs, e.g., *collect*, which allow both BPs and CBNs. The contrast between CBNs and BPs seems to also hold in Brazilian Portuguese, although my informants point out that the use of CBNs does not result in complete ungrammaticality, but only in reduced acceptability compared to the versions with BPs, which are fully acceptable:

- (6) a. João coleciona selo.  
 João collects stamp  
 b. João coleciona selos.  
 João collects stamps

- (7) a. ?? João compara selo.  
       João compares stamp  
       b. João compara selos.  
       João compares stamps

Sergio Menuzzi observes that the examples in (8a-c) seem perfectly acceptable:

- (8) a. {João/Todo bom consumidor} compara preço antes de fazer  
       uma compra.  
       John/Every good consumer compares price before making  
       a buy  
       b. Quando me pedem pra selecionar um novo funcionário, a primeira  
       coisa que faço é comparar currículo. (Se necessário, faço  
       entrevista também.)  
       if people ask me to select a new employee, the first thing I do is  
       to compare curriculum. (If necessary, I conduct interview too.)  
       c. Depois de tantos anos dando aula, não comparo mais aluno.  
       after so many years teaching, I don't compare student  
       anymore

But note that in these examples, the CBNs do not have existential readings, but instead they have a totality reading (see § 2.2 below): they refer to the totality of the contextually relevant entities and translate by definite plurals in the other Romance languages.

The contrast between existential CBNs and BPs can be observed with other verbs that have the same selectional requirements as *comparar* 'compare', as shown in the examples in (9); the use of *ontem* 'yesterday' is meant to filter out the habitual/dispositional interpretation, which renders CBNs with these verbs acceptable for most speakers, an issue that I leave aside here:<sup>2</sup>

- (9) a. ??Ontem à tarde, Carlos enumerou qualidade de João.  
       a'. Ontem à tarde, Carlos enumerou qualidades de João.  
       b. ??Ontem à tarde, Maria listou livro.  
       b'. Ontem à tarde, Maria listou livros.  
       c. ??Ontem à tarde, João misturou caneta.  
       c'. Ontem à tarde, João misturou canetas.  
       d. ??Ontem à tarde, João embaralhou folha de endereço.

<sup>2</sup> Marcelo Ferreira pointed out to me that some of the verbs in (9) allow an interpretation on which the CBN is interpreted as referring to a singular entity (to my knowledge, this reading has not been previously reported in the literature). On this reading, some of the examples in (9), e.g., (9e), might be acceptable to some speakers. Relevant to the present discussion are only number-neutral readings of CBNs.

- d'. Ontem à tarde, João embaralhou folhas de endereço.
- e. ??Ontem à tarde, Maria separou artigo.
- e'. Ontem à tarde, Maria separou artigos.
- f. ??Ontem à tarde, Pedro numerou livro.
- f'. Ontem à tarde, Pedro numerou livros.
- g. ??Ontem à tarde, João reuniu artigo.
- g'. Ontem à tarde, João reuniu artigos.
- h. ??Ontem à tarde, Carlos combinou elemento de decoração.
- h'. Ontem à tarde, Carlos combinou elementos de decoração.

## 2.2 Totality readings and existential readings

Condoravdi (1992, 1994) observed that BPs in English allow a totality reading (labelled 'functional' by Condoravdi herself), which is distinct from both the generic and the existential readings. On this third construal, English BPs refer to the totality of the contextually relevant entities that satisfy the descriptive content of the BP (they are translatable by definite plurals in Romance languages other than Brazilian Portuguese). Examples such as (10) are ambiguous between the existential and the totality readings.

- (10) a. Last year students went on strike. (ambiguous)
- b. Prices of vegetables went up yesterday. (ambiguous)

In Brazilian Portuguese, the corresponding examples can be translated with both CBNs and BPs, but the choice of one or the other yields different interpretations. CBNs have the totality reading, but not the existential reading, and the reverse is true for BPs:

- (11) a. Aluno no ano passado fez greve. (totality reading only)  
       student last year went on strike  
       '[All] students went on strike last year.'
- b. *Preço de verdura subiu ontem.*  
       price of vegetables went up yesterday  
       '[All] prices of vegetables went up yesterday.'
- (12) a. Alunos no ano passado fizeram greve. (existential reading;  
       %totality reading)  
       '[Some] students went on strike last year.'
- b. *Preços de verdura subiram ontem.*  
       prices of vegetables went up yesterday  
       '[Some] prices of vegetables went up yesterday.'

The % indication is meant to signal that the totality reading of BPs is accepted by some speakers of Brazilian Portuguese (Roberta Pires de Oliveira) but not by others (Sergio Menuzzi). Although intriguing, this variation is

somewhat peripheral to the present investigation. What we will try to explain is why the existential reading is blocked with CBNs but allowed with BPs.

### 3. Plural and Cumulative Entities

#### 3.1. Pluralized Nominal Predicates and the Interpretations of Bare Plurals

According to Link (1983), plural nouns are pluralizations of singular descriptions, i.e., they are derived from singular nouns via a pluralization operation (the \*-operation):

(13) Plural nouns denote the closure under sum of the corresponding singular predicate.

- a.  $N_{sg}$  denotes a set of atoms
- b.  $N_{pl}$  denotes the closure under sum of  $N_{sg}$  (the set of atoms that have the N-property supplemented with all the sums generated by the atoms)

This analysis is illustrated below with the plural noun *cats*, derived from *cat*:

- (14) a.  $[[cat]]$ : CAT (the set of atoms that have the cat property)  
 b.  $[[cats]]$ : \*CAT (the closure under sum of CAT)  
 c. If  $CAT = \{a, b, c\}$ , then  $*CAT = \{a, b, c, a+b, b+c, a+c, a+b+c\}$

Since a pluralized predicate denotes a set that contains not only plural individuals but also singular individuals (see (13) and (14b-c)), we expect both ‘inclusive’ (atom + sum) readings, as in (15b-c), and ‘exclusive’ (only sums) readings, as in (15a), depending on the context:<sup>3</sup>

- (15) a. Yesterday, John spent his day reading linguistic articles.  
 b. Have you ever read linguistic articles?  
 c. Do you have children?

#### 3.2. Current Analyses of Number-neutral Count Bare Nouns

Turning now to the number-neutral interpretation of count bare nouns, it is currently described (see in particular Munn & Schmitt, 1999, 2005, and Müller, 2002), as in (3), repeated below:

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<sup>3</sup> The choice between the two interpretations depends on a number of factors (Krifka, 1989; Farkas, 2005; Sauerland, 2005) that are irrelevant here.

- (3) Number-neutral CBNs have both atoms and pluralities in their domain of denotation.

Under the more formal phrasing given in (3'), this characterization becomes identical to Link's analysis of plural nouns, the only differences being morphological marking (no marker of plurality), and correlatively, the level of grammar at which pluralization applies (Lexicon for CBNs versus morphosyntax for BPs):

- (3') Count bare nouns denote the closure under sum of the set of atoms in their denotation.

The intuition behind this characterization is that in the absence of plural-marking, a common count noun is not restricted to apply to atomic entities, but may also apply to any plural entity that satisfies its descriptive content. In order to distinguish between bare plurals and CBNs, Chierchia (1998), Munn & Schmitt (1999, 2005) and Müller (2002) propose that the analysis of BPs should be changed: the role of the plural marking would be to strip away the atoms from the denotation of the unmarked count noun:

- (16) a. [[gato]]: \*CAT (the closure under sum of CAT, where CAT is the set of atoms)  
 b. If  $CAT = \{a, b, c\}$ , then  $*CAT = \{a, b, c, a+b, b+c, a+c, a+b+c\}$   
 c. [[gatos]]: \*CAT minus CAT =  
 $= \{a, b, c, a+b, b+c, a+c, a+b+c\} - \{a, b, c\} = \{a+b, b+c, a+c, a+b+c\}$

The analysis of CBNs in (3)-(3') is problematic for the following reasons:

- (17) a. The pluralization operation (the closure under sum of a set of atoms) is assumed to apply (in the Lexicon) in the absence of plural marking.  
 b. BPs are analyzed as 'exclusive plurals' and therefore their 'inclusive' readings (see (15b-c)) cannot be explained.  
 c. We cannot account for the contrasts between CBNs and BPs described in section 2.

In this paper I will assume that Link's pluralization operation applies only if the noun is morphologically marked as plural, which means that pluralization does not underlie the denotation of CBNs, but only the denotation of plural nouns (i.e., they denote the closure under sum of the corresponding singular noun), which means that the domain of BPs contains both atoms and sums. The differences between CBNs and BPs described in

section 2 will be accounted for by proposing a definition of number-neutral CBNs that does not rely on pluralization.

### 3.3. Number Neutral CBNs Refer to Amounts of Objects

In a nutshell, my view of the number-neutrality of CBNs in Brazilian Portuguese is stated in (18):

- (18) CBNs refer to amounts of objects of unspecified quantity (the number of minimal entities contained in each amount is indeterminate).

The definition in (18) relies on the notion of amount, which is a particular type of entity. The domain of entities is currently assumed to be typed, containing at least objects and events. Objects are themselves of several types: individuals (corresponding to singular descriptions), pluralities (corresponding to plural descriptions) and amounts, which correspond to mass descriptions (Higginbotham, 1994; Moltmann, 1997). Unlike individuals, which belong to sets, amounts are necessarily ordered by part-whole relations. Pluralities are less clearly distinguishable from the other two types of objects: they are made up of singular individuals, and according to Link (1983, 1984) they should be viewed as ‘plural individuals’ (which means that they are of the same semantic type as singular individuals). But on the other hand, bare plurals resemble amounts of mass stuff in that they exhibit cumulativity:

- (19) a. If A are children/ tables/ cats... and  
       B are children/ tables/ cats...  
       A and B are children/ tables/ cats...  
       b. If A is gold/ mud/ water... and  
       B is gold/ mud/ water ...  
       A and B is gold/ mud/ water ...

In order to account for their long-noticed similarities, we need some representation that would suit both pluralities and amounts. According to Chierchia (1995) followed by Kratzer (2005), Rothstein (2010), a.o., mass nouns are to be modeled as pluralities. More precisely, mass nouns are ‘inherently plural’, i.e., their plurality is part of their lexical representation; pluralization, i.e., the closure under sum of a domain of atomic entities, would apply (or would ‘be already there’) in the Lexicon. The current analysis of count bare nouns, briefly reviewed in the previous section, follows the same line of inquiry: pluralization would apply in the Lexicon not only for mass nouns, but also for count nouns. Besides the problems listed in (17), this account is problematic in that the distinction between count and mass nouns is lost, and indeed, according to Chierchia, in certain languages, e.g., Chinese, all nouns are ‘mass’ nouns. Evidence against this view can be found in



Doetjes (1997) and Cheng & Sybesma (1999) for Chinese and in Munn & Schmitt (1999, 2005) and Müller (2002) for Brazilian Portuguese.

Since a more in-depth discussion of Chierchia's theory cannot be pursued in the limits of this short article, let me simply conclude that I will not assume it because: (i) the analysis of mass nouns as inherently/lexically plural is problematic; (ii) the analysis of count bare nouns as pluralized in the Lexicon is problematic (see (17) above); (iii) count bare nouns should be kept distinct from mass nouns.

More specifically, the proposal that I want to defend here is that cumulativity does not depend on pluralization, but instead is a primitive negative notion, best characterized as non-individuability. I assume two types of primitive objects,<sup>4</sup> individuals on the one hand and amounts of matter, which are negatively characterized as non-individuals. In the Lexicon, count nouns denote sets of individuals (atomic entities), whereas mass nouns denote sets of amounts/quantities of stuff (Higginbotham, 1994; Moltmann, 1997) and their domain is non-atomic (Link, 1983). Plural-marking on count nouns triggers pluralization; in other words, plural nouns denote the closure under sum of the set of atomic entities denoted by the corresponding unmarked count noun.

Granting this much, let us now turn to the issue under examination here, namely the analysis of CBNs. My proposal is that they resemble mass nouns insofar as they refer to amounts (of indistinguishable objects).

This is not to say, however, that under my account CBNs are identified to mass nouns. I will follow Moltmann (1997) in assuming that the difference between the two classes of nouns relies on the notion of integrated whole. Count nouns are descriptions of integrated wholes, i.e., they denote sets of atomic objects, which satisfy integrity constraints such as shape, space-occupation and relations between their parts. Mass nouns, on the other hand, lack integrity constraints,<sup>5</sup> they are 'inherently cumulative', i.e., they are descriptions of amounts.

CBNs occupying argument positions are like mass nouns insofar as they are cumulative (i.e., they refer to amounts (of objects) of unspecified quantity), but they differ from mass nouns in that their cumulativity is not due to their lexical features (in other words, CBNs are not 'inherently'/lexically cumulative) but rather to the fact that their DP projection lacks Number (Munn & Schmitt, 1999, 2005). Because they are cumulative, CBNs refer to amounts, but these amounts must satisfy the descriptive property of a count noun; since count nouns describe integrated wholes, and since integrated

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<sup>4</sup> Other primitive objects might be needed in the ontology, e.g., groups, corresponding to collective nouns such as *mafia*, *government*, *committee*, *orchestra*, etc. (Link, 1984).

<sup>5</sup> Cumulativity is presumably derivable from lack of integrity: by putting together objects that lack integrity, we get other objects of the same type; by putting together integrated wholes we do not get other integrated wholes, but rather objects made up of several integrated wholes.

wholes are not amounts, a CBN is necessarily understood as denoting an amount made up of an unspecified number of objects.

Let me stress that talking about ‘unspecified number of objects’ is not equivalent to talking about pluralization, nor does it lead to introducing atomic individuals into the denotation of CBNs. Pluralization applies to sets of atoms and yields another set. The notion of ‘number of objects’, on the other hand, is the notion of cardinality, which I take to be akin to measuring. In other words, the number neutral interpretation of CBNs has nothing to do with pluralization, but instead should be viewed as indicating the (vague) cardinality of the amount of objects denoted by the CBN, much in the same way as measure-phrases, e.g., *300g of butter*, indicate the quantity of the amount of stuff denoted by mass nouns. The distinction between pluralization and measuring of amounts is supported by languages such as Hungarian, which have plural morphology (e.g., on bare nouns or on definite and indefinite plurals) but do not use it in DPs headed by cardinal expressions and the version with plural marking on is ungrammatical. Let me note in passing that under the proposal made here, CBNs do not refer to ‘ground/mashed stuff’, which is what they are (wrongly) expected to do on those accounts according to which all nouns are ‘mass’ in the Lexicon.

Summarizing the account proposed above, CBNs refer to amounts, e.g., amounts that have the cat property. One amount differs from another amount by its cardinality, notated  $n$ , obtained by applying a measure function to the amount (see (20a)). This representation is comparable to that of mass nouns, given in (20b):

- (20) a.  $[[\text{cat}]]: \lambda x \exists n (x \text{ has the cat property} \ \& \ \mu_{\text{unit-of-cat}}(x) = n)$   
 b.  $[[\text{gold}]]: \lambda x \exists n (x \text{ has the gold property} \ \& \ \mu_{\text{gram}}(x) = n)$

The main difference between count and mass nouns is that for count nouns the measure unit corresponds to the integrated whole that satisfies the description of the count noun, which corresponds to the minimal amount of matter that satisfies the description provided by the count noun, whereas for mass nouns, the descriptive property denoted by the noun does not allow us to identify minimal amounts.<sup>6</sup> Therefore, in order to measure the quantity of an amount denoted by a mass noun we need various measure units, e.g., grams, meters, cube-meters, etc. Crucially, under this analysis of CBNs, atomic cats are not individuals, but rather measure units, i.e., *Qua* individuals, atomic cats are each distinct from any other atomic cat, a distinction that can be notated by numerical indices (see § 5 below). *Qua* measure units, on the other hand,

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<sup>6</sup> Note that under the view proposed here, it is irrelevant whether or not mass nouns have minimal parts. What matters is that mass nouns do not describe their minimal parts, if they have any. Thus, *furniture* refers to amounts of matter that have well-circumscribed minimal parts, but it does not describe those minimal parts, and therefore *furniture* is a mass nouns, on a par with *gold*.

atomic cats are cat-amounts of cardinality 1, which are indistinguishable from other cat-amounts of cardinality 1. To say that the cardinality of the cat-amount denoted by the CBN is unspecified is to say that the cat-amount contains an unspecified number (possibly fractional) of minimal amounts that have the cat property.

In sum, we have replaced an analysis relying on atomicity and pluralization (according to which number-neutral CBNs have ‘both atoms and sums’ in their denotation) with an analysis that makes use of the notion of amount of unspecified cardinality, according to which CBNs have ‘neither atoms nor sums’, but rather amounts of objects, in their domain of denotation. In other words, CBNs are represented as amounts of cardinality higher than (or different from) 1 rather than as plural entities obtained by applying a pluralization operator to a set of atoms. Under this proposal, counting does not rely on pluralization: we can count the minimal elements contained in an amount even though the amount is not obtained via pluralizing. This view can capture a clear crosslinguistic generalization: with some possible exceptions, all natural languages have counting expressions, but only a limited number of languages have plural inflection.<sup>7</sup>

The proposed definition of number-neutral CBNs obeys the constraint stated in (21), which is violated by the current view in (3)-(3’):

- (21) No pluralization operation without plural marking!

#### 4. Selectional restrictions

Let us now explain Dayal’s puzzle presented in the Introduction and repeated below:

- (22) a. João coleciona selo.  
           João collects stamp  
       b. João coleciona selos.  
           João collects stamps  
 (23) a. ?? João compara selo.  
           João compares stamp  
       b. João compara selos.  
           João compares stamps

Dayal’s own suggestion is that CBNs denote atomic entities. The plural construal of CBNs is due to a pluractional operator located on the VP. CBNs are disallowed if the minimal events in the denotation of the VP-predicate necessarily contain more than one entity (see *compare*); CBNs would be

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<sup>7</sup> Plural free morphemes have a quite different behavior from that of plural inflection (see Zribi-Hertz, 2005, on Korean)

allowed with verbs such as *collect*, because the minimal events in the denotation of *collect* allow atomic entities (we collect stamps by adding one stamp per minimal event). CBNs are disallowed if the minimal events in the denotation of the VP-predicate necessarily contain more than one entity (see *compare*);

I find this suggestion problematic: although *buying* one stamp after the other are events that are related to *collecting* stamps, we cannot assume that events of buying belong to the set of events denoted by *collect*. Note moreover that one can be said to be a ‘stamp-collector’ only if one has more than one stamp, and in fact a considerable amount of stamps.

Let me propose instead that *compare* is a symmetric predicate, which selects two internal arguments. The two arguments can be realized in distinct argument positions, as in (24a-b), or as conjoined DPs, as in (24c), or as plural DPs, as in (23b):

- (24) a. I compared John to Mary.  
 b. I compare Mary to John.  
 c. I compared John and Mary.

The two arguments of symmetric predicates must be distinguishable from each other even if they are syntactically expressed as a plural DP, as in (23b). The distinguishability condition is satisfied by BPs, which can be generated from singular entities by sum-formation: for concreteness, we may assume that the numerical indices of atomic entities are preserved under sum-formation. Thus, if *cat* denotes the set made up of  $cat_1, cat_2, cat_3$ , the bare plural *cats* may denote either  $cat_1 + cat_2$ , or  $cat_1 + cat_3$ , or  $cat_3 + cat_2$  or  $cat_1 + cat_2 + cat_3$ , all of which contain distinguishable atomic entities. These predicates disallow CBNs, because this type of BNs denote cat-amounts, which do not contain distinguishable individuals (recall that the atomic cats inside cat-amounts count as measure units, not as individuals).

## 5. Constraints on the Strong Readings of Bare Nouns

Since Milsark (1977), indefinite DPs headed by overt determiners are known to be ambiguous between weak and strong readings (note that some determiners, e.g., accented *some* in English or certains ‘some’ in French are only compatible with the strong reading, whereas other determiners, e.g., unaccented *some* or *des* in French favor the weak reading). The weak vs strong distinction is also found with BPs, but under a somewhat different guise. Weak BPs are interpreted existentially, in which case they behave like weak indefinites, whereas strong BPs are either kind-referring (Carlson, 1977) or totality-referring (see Condoravdi’s (1992, 1994) ‘functional’ reading). Totality and kind-referring readings are not available to strong indefinite DPs, which can instead be interpreted as specific/partitive and taxonomic. Such

strong readings are less obvious for BPs, but they have nevertheless been parenthetically alluded to by some theorists (for specific/partitive readings of BPs see Condoravdi, 1992, 1994, and Chierchia, 1998, in particular his discussion of *parts of this machine*; for the taxonomic reading of BPs, see Dayal's (2004) discussion of BPs in the object position of *invent*). In sum, BPs can take the strong readings that characterize indefinite DPs, in addition to totality and kind-referring readings,<sup>8</sup> which are not available to indefinites.<sup>9</sup>

- (25) Strong readings
- a. of indefinite DPs: specific/partitive (and taxonomic)
  - b. of BPs: kind-referring, totality, specific/partitive (and taxonomic)

Turning now to CBNs in Brazilian Portuguese, our main concern will be an explanation for the following generalization:

- (26) CBNs allow kind-referring and totality readings, but do not allow specific/partitive readings (nor taxonomic readings).

### 5.1 Referential Indices and the Weak vs Strong Distinction

On their unmarked 'weak' reading (in the sense of Milsark, 1977), existential bare nouns – regardless of whether they are plural, singular or number-neutral – can be analyzed as supplying variables that get bound by VP-level existential closure (Diesing, 1992).<sup>10</sup> The necessity of VP-level existential closure may be attributed to the fact that the variables supplied by BNs do not range over individuals (individualizable objects), but rather over amounts of objects.

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<sup>8</sup> The kind-referring readings of BPs are not available in all the languages that allow BPs: English and Brazilian Portuguese allow kind-referring BPs, whereas Romance languages other than Brazilian Portuguese do not allow them. As to the specific/partitive readings of BPs, they seem to be absent in Romanian, but seem to be found with prepositional-marked object BPs in Spanish. The crosslinguistic variation regarding the kind-reference of BPs has been attributed to parametrical options bearing on the syntactic properties of the functional categories of Determiners and/or Number. According to Longobardi (1994), the (un)availability of kind-referring readings of BNs is due to the (im)possibility of N-to-D movement, whereas Dobrovie-Sorin (2009b) attributes this crosslinguistic variation to the different location of the Number feature (in either little *n* (in English) or *D* (in Romance languages)). The choice between these two accounts is not directly relevant here.

<sup>9</sup> The parentheses around 'and taxonomic' in (26) are meant to indicate that, because of lack of space, this type of readings here will not be examined here. See Dobrovie-Sorin & Pires de Oliveira (2010) on the correlation between specific/partitive and taxonomic readings.

<sup>10</sup> For arguments against the property-analysis of weak indefinites (vanGeenhoven, 1996; Dobrovie-Sorin, 1997a,b, a.o.) the reader is referred to Dobrovie-Sorin (2009a).

The difference between these two types of objects can be captured by using numerical indices (Dobrovie-Sorin, 2009a), Dobrovie-Sorin & Beyssade, in press):

- (27) a. Variables that range over atomic individuals are assigned numerical indices.  
 b. The numerical indices of atomic individuals are transferred to the plural individuals generated by the sum-operation.  
 c. Variables that range over amounts of objects cannot be assigned numerical indices.  
 d. Unindexed variables must be bound by VP-level existential closure.  
 e. Indexed variables remain free at LF.  
 f. Indexed variables underlie the strong readings of indefinites.

The suggestion made here is that VP-level existential closure is imposed by the lack of numerical indices. Those indefinites that supply numerically-indexed variables have a much freer distribution. Such indefinites are ‘strong’ in Milsark’s (1977) terms.

## 5.2 Kind-referring and totality readings

Kind-referring readings of BPs, illustrated in (28) for English, are obtained by applying the Down operator (intensional iota operator) to the property denoted by the BP (Chierchia, 1998):

- (28) Dinosaurs are extinct.

According to Dobrovie-Sorin & Laca (1996, 1998) and Dobrovie-Sorin (2009a), kind-reference also underlies the generic readings of BPs in characterizing sentences (compare Diesing, 1992, or Kratzer, 1995, who analyze such BPs as indefinites bound by the Gen(eric) operator):

- (29) Students are intelligent.

A further proposal made by Dobrovie-Sorin & Laca, 1996, 1998) is that the totality reading (see Condoravdi’s, 1992, 1994) ‘functional readings’) of BPs illustrated in (30) relies on the Down operator, just like as kind-reference:

- (30) a. Prices went up yesterday.  
       ‘All the prices went up’  
 b. In 1968 students were on strike  
       ‘All the students ...’

According to Dobrovie-Sorin & Laca (1996, 1998), the only difference between kind-referring and totality referring BPs (see (28)-(29) vs (30)) is that the latter are contextually restricted (e.g., to one country or to one campus, as in (30a-b)), whereas the former are contextually unrestricted, hence their intensional meaning. The fact that kind-referring and totality interpretations are due to the same operator predicts that if in a given language BNs can be interpreted as kind-referring, they should also have totality readings (Dobrovie-Sorin & Laca, 1996, 1998). Since CBNs in Brazilian Portuguese allow kind-referring interpretations (Munn & Schmitt, 2005; Dobrovie-Sorin & Pires de Oliveira, 2007, 2008), we expect them to also allow totality readings. This expectation turns out to be correct:

- (31) a. Dinossauro está extinto. (kind-predicate + CBN)  
 dinosaur is extinct  
 b. Aluno é inteligente. (characterizing predicate + CBN)  
 student is intelligent  
 c. Aluno entrou em greve em 1968. (totality CBN)  
 student was on strike in 1968

Note that a similar prediction is made for BPs: if they are kind-referring, they should also allow totality readings. However, as already noted in § 2.2 above, grammaticality judgments vary from one speaker to another, hence the % indication:

- (32) a. Dinossauros estão extintos.  
 dinosaurs are extinct  
 b. Alunos são inteligentes.  
 students are intelligent  
 c. Em 1968, alunos entraram em greve. (existential; % totality)  
 in 1968, students were on strike

The totality reading is difficult to tease apart from the existential reading. One way (suggested to me by Sergio Menuzzi) to force the totality reading is by using *sem exceção* "without exception". Note that whereas *sem exceção* "without exception" is acceptable with both kind-referring BPs (see (33)a-b) and definite plurals (preceded or not by *todos*) as in (33)c-d, the judgments vary for episodic sentences built with totality-referring BP (see (34)):

- (33) a. Estudantes de lingüística são, sem exceção, muito inteligentes.  
 students of linguistics, with no exception, are very intelligent.  
 b. Adolescentes são, sem exceção, preguiçosos.  
 teenagers, with no exceptions, are lazy  
 c. (Todos) os preços de verdura subiram ontem, sem exceção.  
 (all) the prices of vegetables, with no exception, went up  
 yesterday

- d. Em 1968, (todos) os estudantes, sem exceção, entraram em greve.  
in 1968, (all) the students, with no exception, were on strike
- (34) a. % Preços de verdura subiram ontem, sem exceção.  
prices of vegetables, with no exception, went up yesterday
- b. % Em 1968, estudantes, sem exceção, entraram em greve.  
in 1968, students, with no exception, were on strike

These data seem to indicate that the correlation between the generic and the totality readings of BPs does not hold for all speakers of Brazilian Portuguese. This fact, which is unexpected under the view that both readings rely on the Down operator, might be due to some specialization of the interpretations of BPs from those of CBNs. Note also that according to Marcelo Ferreira and Roberta Pires de Oliveira, the kind-referring reading of BPs is not perfectly acceptable in certain contexts at least. I will leave this issue open for further research.

Turning now to CBNs, their totality reading is accepted by all my informants. In particular, the 'no exception' qualifier is allowed with CBNs in existential contexts:

- (35) a. Preço de verdura subiu ontem, sem exceção.  
price of vegetables, with no exception, went up yesterday
- b. Em 1968, estudante, sem exceção, entrou em greve.  
in 1968, student, with no exception, was on strike

### 5.3 Specific/partitive readings

The example in (36) illustrates the specific/partitive reading of indefinite DPs, which can be described as in (37):

- (36) Some students are intelligent.
- (37) A DP is interpreted as specific/partitive if it presupposes that the NP-set contains elements that do not have the property denoted by the VP.

The complex label I use here is needed because the definition in (39) holds of various interpretations that have been distinguished in the literature on indefinites, e.g., specific, referential, partitive, D-linked. Note in particular that the definition in (37) does not rely on the notion of contextually restricted set, which characterizes only D-linked (Pesetsky, 1987) indefinites. Specific and referential indefinites – if they can be distinguished at all in the semantic representation – constitute yet other sub-types of 'specific/partitive' indefinites.



Let us now consider the examples in (38),<sup>11</sup> which show that in existential contexts, BPs in Brazilian Portuguese can appear quite freely in the preverbal subject position, much like English BPs and unlike BPs in Romance languages such as Italian, Spanish or Romanian, where they can do so only if they are modified, coordinated or if they carry phonological stress:

- (38) a. Fontes próximas ao presidente me contaram que ele está pronto para se aposentar.  
 ‘(some) Sources close to the president told us that he is ready to resign.’  
 b. Gambás com apetite furioso comeram minhas flores na noite passada.  
 ‘(some) Raccoons with a ferocious appetite ate my flowers last night.’

The fact that existential BPs are acceptable in the preverbal subject position in English may be attributed to the fact that this language disallows postverbal subjects. Compare Romance languages such as those mentioned above, which allow postverbal subjects, and correlatively impose constraints on subjects occurring in the preverbal position. The acceptability of preverbal BPs in Brazilian Portuguese cannot be explained in the same way as in English for at least two reasons: (i) in this language, postverbal subjects are more acceptable than they are in English; (ii) the preverbal position disallows existential CBNs, as shown in (39):<sup>12</sup>

- (39) a. ??Fonte próxima ao presidente me contou que ele está pronto para se aposentar.  
 ‘Source close to the president told us that he is ready to resign.’  
 b. ??Gambá com apetite furioso comeu minhas flores na noite passada.  
 ‘Raccoons with a ferocious appetite ate my flowers last night.’

My proposal is that the preverbal BPs in (38) have specific/partitive readings (hence the gloss ‘some N’), which are inaccessible to CBNs, due to the constraints on the assignment of numerical indices introduced in § 5.1 above, and repeated here:

<sup>11</sup> These examples are counterparts of Condoravdi’s examples, which according to Condoravdi have specific readings. The relevance of specificity will become relevant in a minute.

<sup>12</sup> According to some of my informants, the examples in (39a-b) are unacceptable. Some other informants observe that if it is at all interpretable, (39b) talks about a non-specific, unknown raccoon, which means that for these speakers, CBNs may refer to singular entities (see also footnote 2 above), an interpretation that is not relevant here.

- (40) a. Variables that range over atomic individuals are assigned numerical indices.  
 b. The numerical indices of atomic individuals are transferred to the plural individuals generated by the sum-operation.  
 c. Variables that range over amounts of objects cannot be assigned numerical indices.  
 d. Unindexed variables must be bound by VP-level existential closure.  
 e. Indexed variables remain free at LF.  
 f. Indexed variables underlie the strong readings of indefinites.

Since the variables supplied by CBNs range over amounts of objects, they cannot be assigned numerical indices, and as such they must be bound by VP-level existential closure. This explains why (leaving aside their kind-referring and totality readings) CBNs in Brazilian Portuguese are restricted to appear in the postverbal subject position, where they can only have the weak existential reading.

Since BPs are generated from atoms, the variables they introduce can be assigned numerical indices. I take numerical indices (i) to dispense indefinites and BNs from being bound by VP-level existential closure and correlatively (ii) to be necessary for specific/partitive readings to arise. This explains why BPs can freely appear in the preverbal subject position, and why they can take specific/partitive readings.<sup>13</sup>

The proposal made above sheds new light on the data in (41), which was observed, but not explained by Munn & Schmitt (2005), who did not distinguish between totality and specific/partitive readings:

- (41) a. *Mulheres discutiram as eleições.*  
 women discussed-PERF the elections  
 ‘[some, certain] women discussed the elections.’  
 ([..] = my addition to M&Sch’s gloss)  
 b. *?Mulher discutiu as eleições.*  
 woman discussed-PERF the elections  
 c. *Mulher discutiu as eleições, homem discutiu futebol . . .*  
 woman discussed-PERF the elections, man discussed-PERF soccer  
 ‘Women discussed the elections, men discussed soccer . . .’  
 (examples from Munn & Schmitt (2005), see their (5))

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<sup>13</sup> In the context of the present article, which focuses on CBNs, this analysis of BPs cannot be further motivated, but the interested reader may find some relevant discussion on the taxonomic readings of BPs in Dobrovie-Sorin & Pires de Oliveira (2010). The distinction between indexed and non-indexed variables was introduced in Dobrovie-Sorin (2009a) and Dobrovie-Sorin & Beyssade (in press, Chapter 2).

Since CBNs allow totality readings, the difference in acceptability shown in (41b-c) may be explained by invoking some constraint on such readings. To understand what kind of constraint is at work here, let us consider the difference between the examples in (35a-b) and those in (41): in (35a-b), the totality interpretation is easily accessible, because a relevant context can be easily accommodated for the totality of prices or of students, e.g., a certain country that is part of the background of the utterance. It is arguably more difficult to refer to the totality of women (without using an overt definite article) at a given party, hence the marginal acceptability of (41b). The example in (41c) shows that the totality reading is facilitated if the context specifies another maximal entity which – in the same context – is involved in some other activity. Turning now to (41a), it cannot be analyzed as involving the totality reading, because on that reading, BPs should be as marginal as CBNs. The conclusion must be that the BP in (41a) has a partitive/specific interpretation rather than a totality reading.

Summarizing, kind-referring and totality readings are possible for CBNs (and for bare mass Ns, which were not illustrated here), because these readings rely on the Down operator, which applies to a cumulative property (regardless of whether it is derived via pluralization or not) and yields the maximal object in the extension of that property. Specific/partitive readings, on the other hand, depend on numerically indexed variables and since the variables supplied by CBNs cannot be indexed, these bare nouns do not allow specific/partitive readings.

My proposal also explains why BPs freely appear in the preverbal subject position, whereas CBNs cannot do so. Since BPs in Brazilian Portuguese can have specific/partitive readings, they are free to occur in the preverbal position; and since existential CBNs are necessarily weak, they are ruled out from that position (since Brazilian Portuguese allows postverbal subjects, the preverbal subject position is accessible only to strong DPs). When CBNs do appear in the preverbal subject position, they can only have a kind-referring or a totality reading, resulting from an application of the Down operator.

## 6. Conclusions

The main goal of the paper was to show that in order to account for contrasts between CBNs and BPs in Brazilian Portuguese we need to define cumulativity as reference to amounts rather than as reference to entities that range over a domain that contains both atoms and pluralities. I have not insisted on the locus of the cumulativity of CBNs: does it pertain to the Lexicon or to some other level of representation? Because I insisted on the necessary distinction between count nouns (sets of atomic entities) and mass nouns, which are lexically cumulative (denote sets of amounts), the implicit answer to the above question is that the cumulativity of CBNs does not pertain to the Lexicon, but comes in at a later level of representation. One possibility

is to assume that number-neutrality/cumulativity is a default value that is assigned to Number in case Number is not valued (as either singular or plural) in the morphosyntax. If we want to assume that Number is absent from the maximal projection of CBNs (Munn & Schmitt, 1999, 2005) we may assume that number-neutrality is a default interpretation that arises for DPs lacking Number. Finally, if we want to assume that CBNs lack even the D-position, we may assume that number-neutrality is the default interpretation of CBNs in argument positions. The crucial point, which is common to the three theoretical options just mentioned, is that in the Lexicon, i.e., at the NP-level, CBNs are singular descriptions (denote sets of atomic entities); their cumulativity comes in at the level of their maximal projection.

The hypothesis that the cumulativity of CBNs does not pertain to the Lexicon is an important departure from the view that all nouns are cumulative in the Lexicon, which is widely assumed (following Krifka (1989)) in the current literature. Given the wide consensuality of Krifka's hypothesis, I might want to make it compatible with my definition of number-neutrality as reference to amounts. Note that so far I have remained rather vague regarding the level at which cumulativity is to be represented. There are however two objections against the hypothesis that all predicates, and in particular count nouns, are cumulative in the Lexicon for. On the conceptual side, saying that count nouns are both singular descriptions and cumulative *in the Lexicon* is contradictory. The minimal conceptual cost would be some stipulation designed to wipe out that contradiction. But more importantly, it can be shown that the paradoxical data presented in Ferreira (this volume) can be accounted for within my theory of number-neutrality only if we assume that CBNs in Brazilian Portuguese are singular in the Lexicon, while their maximal projection is cumulative.

The main generalizations made in this paper can be summarized as follows:

- (42) a. Amounts of objects are distinct from pluralities.  
 b. The difference between amounts and pluralities is relevant for selectional restrictions.  
 c. Specific/partitive readings are incompatible with reference to amounts of unspecified cardinality, but compatible with reference to pluralities of unspecified cardinality.

The reason for (42c) is that pluralities of unspecified cardinality may function as (plural) individuals, whereas by definition amounts of objects are not individuals.

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