

THE SEMANTICS OF GENERIC QUANTIFICATION IN BRAZILIAN PORTUGUESE*

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0 Introduction

This paper investigates the semantics of kind-referring expressions and of generic quantification in Brazilian Portuguese (BP). It may thus be taken as a contribution to the development of a more accurate understanding of genericity as a crosslinguistic phenomenon. In BP genericity may be expressed by both definite singular (1) and definite plural (2) nominals, and also by indefinite nominals such as the indefinite generic (3), the bare numberless (4) and the bare plural (5).¹ The main goal of the paper is to address the differences in the interpretations of these five types of generic expressions in BP in light of the distinction between generically quantified sentences and kind-referring expressions (cf. Krifka *et al.* 1995).

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¹ Throughout this paper I use the terms 'nominal' and 'nominal expression' when I wish to remain neutral to the debate of whether the nominal constituent is a Determiner Phrase or a Noun Phrase. I also opt for the term 'bare numberless', instead of the more traditional 'bare singular' because I do not want to assume that this nominal has already undergone a singularizing operation.

(1) O brasileiro é trabalhador.²

The-SG brazilian is hardworking

'Brazilians are hardworking'

(2) Os brasileiros são trabalhadores.

The-PL brazilians are hardworking

'Brazilians are hardworking'

(3) Um brasileiro é trabalhador.

a brazilian is hardworking

'Brazilians is hardworking'

(4) Brasileiro é trabalhador.

brazilian is hardworking

'Brazilians are hardworking'

(5) Brasileiros são trabalhadores.

brazilians are hardworking

'Brazilians are hardworking'

² I'll use SG for singular and PL for plural whenever English does not have the corresponding markings. Gender will not be contemplated in the glosses.

The paper argues that an explanation for the semantics of generic quantification in Brazilian Portuguese emerges if one takes the denotation of common nouns in this language as a neutralization between atomic and plural denotations. Count common nouns in BP are best analyzed as denoting both atomic and plural individuals.³ The different interpretations of generic indefinites may then be attributed to the semantics of a SINGular and of a PLural operator and to the semantics of generic quantification.

The outline of the paper is as follows. In section 1, the theoretical background against which the phenomenon of genericity in BP will be examined is laid out. Section 2, presents the descriptive facts on the expression of genericity in BP. In section 3, I propose a denotation for common nouns in Brazilian Portuguese, and an interpretation for both a SINGular and a PLural operator which I claim to exist in that language. In section 4, I apply the proposed framework to the derivation of the logical forms of BP generically quantified sentences. Finally, a summary of what has been achieved is presented.

1 Kind-Referring Expressions versus Generic Quantification

In this section I present the theory on genericity on Krifka *et al.* (1995). Genericity in Brazilian Portuguese will be studied against such background. The authors highlight the existence of two distinct phenomena: (i) *generic noun phrases* or *kind-referring expressions* - expressions that denote kinds, and (ii) *generic quantification* or *characterizing sentences* - sentences under the scope of a generic quantifier.

³ The paper only addresses the interpretation of nouns that are traditionally classified as count. Mass nouns are left out of the discussion (but see Müller 2001 for a follow-up on this matter.)

Kind-referring expressions are taken to behave as proper names of kinds and only certain types of phrases are able to perform this role - most typically, the definite Determiner Phrase (DP) in both Germanic and Romance Languages. Carlson (1977) claims that natural language ontology entertains entities called kinds. Kinds are entities just like *Mary* or *those girls*, but they differ from individuals in that they have scattered realizations. Kinds are typically derived from their specimens. Kind-referring expressions denote such entities.

Characterizing sentences, on the other hand, are quantified generalizations over situations, or individuals. The variable over which a generalization over individuals quantifies in a characteristic sentence is provided by indefinite nominals (cf. Heim 1982). Therefore, indefinite nominals with a generic interpretation do not refer straightforwardly to kinds. Sentences (6) and (7) illustrate the two ways of expressing genericity through their respective glosses.

(6) The dodo is extinct.

'The species *Raphus cucullatus* is extinct'

(7) A lion weighs more than 200 pounds.

'Usually, if x is a lion, x weighs more than 200 pounds'

As first proposed in Heim (1982), indefinite nominals may be analyzed as predicates containing a free variable, which will wind up bound by either a covert or an overt operator. Heim (1982), following Lewis (1975), was also the first to suggest that sentences with generic indefinites might be analyzed as parallel to conditional sentences, as illustrated by the paraphrase of sentence (7). 'Generic' indefinites

then are just 'normal' indefinite nominals bound by a generic quantifier. Therefore, their semantics is going to be whatever the semantics of indefinite DPs is plus the semantics for characterizing sentences.

Inspired on Heim's suggestion, Carlson (1989) and Krifka *et al.* (1995) adopt an analysis of characterizing sentences with indefinites as sentences containing an unrealized relational generic operator - **GEN** - that takes a **restrictor** and a **matrix** or **nuclear scope** as its arguments. An example of a characterizing sentence with both a generic and an existential indefinite and of its corresponding logical form with use of GEN is shown in (8).⁴ It is worth noting that it is the x variable that gets bound by the GEN operator, the y variable is bound by an existential operator (cf. Heim 1982).⁵

- (8) a. A unicorn has a horn.
b. **GEN** [x;y] (x is a unicorn; y is a horn & x has y)
= **GEN** [x;] (x is a unicorn; \exists y [y is a horn & x has y])
c. 'Typically, if x is a unicorn, there is a y such that y is a horn and x has y'

2 Setting the Scene - Genericity in Brazilian Portuguese

⁴ *Logical form* is being used here as a level of representation where the truth conditions of a sentence are expressed. It does not necessarily coincide with the LF level of Generative Syntax.

⁵ The variables before the semi-colon are the ones that get bound by GEN and the variables after the semi-column are the ones that get bound by an existential closure operation within the matrix. Predicates are in bold letters, kinds are in small capitals. GEN is a relational quantifier that takes two sentences as its arguments. For details on the formalism see Krifka *et al.* (1995).

In this section, I consider in detail the behavior of the singular and plural definite generic, and of the generic indefinite, the bare numberless and the bare plural in Brazilian Portuguese. I will do so against a background that takes the difference between kind-reference and generic quantification into account.

Brazilian Portuguese pairs with most Romance languages in that genericity may be expressed by a plural definite generic (10) and by a bare plural (12). Nonetheless, BP is also similar to English in that it has a productive singular definite generic (9), and that bare nouns (12 and 13) are not restricted to positions that obey conditions on empty categories as they are in most Romance languages (cf. Longobardi 1994). On the other hand, it is also similar to Chinese in that it has a very productive bare numberless nominal (12). BP, therefore, is an interesting language in which to examine the semantics of genericity.

- (9) O brasileiro é trabalhador.
the-SG brazilian is hardworking
'Brazilians are hardworking'
- (10) Os brasileiros são trabalhadores.
The-PL brazilians are hardworking
'Brazilians are hardworking'
- (11) Um brasileiro é trabalhador.
a brazilian is hardworking
'Brazilians is hardworking'
- (12) Brasileiro é trabalhador.

brazilian is hardworking

'Brazilians are hardworking'

(13) Brasileiros são trabalhadores.

brazilians are hardworking

'Brazilians are hardworking'

Krifka *et al.* (1995) and Gerstner & Krifka (1993) propose a number of diagnostic tests and describe some typical properties that distinguish sentences with kind-referring nominals from generically quantified sentences. I will make use of some of these tests and properties in order to make some descriptive generalizations on the expression of genericity in Brazilian Portuguese.

First, there are some predicates like *be extinct* that subcategorize for kinds. Consequently, nominals that can be used as arguments of these predicates will be kind-referring. The contrast between (14) and (15) illustrates this test in that the definite DP can denote a kind in English, but the indefinite DP cannot. This will be our test (i).

(14) The dodo is extinct.

(15) *A dodo is extinct.

Next, kinds need to be well-established within a culture or a cognitive system (cf. Carlson 1977). As a consequence, sentences that attribute some property to a kind will sound peculiar when uttered of not

well-established kinds. Compare (16) to (17).⁶ Note that the sentence with the well-established 'coke bottle kind' is fine with a kind interpretation whereas the sentence with the 'green bottle kind' is not. The indefinite generic, on the other hand, is indifferent to this change (18-19). This is taken to mean that the indefinite generic is not a kind-referring expression and that the genericity expressed by these sentences does not stem from the nominal. This will be our test (ii).

(16) The Coke bottle has a narrow neck.⁷

(17) ??? The green bottle has a narrow neck.

(18) A Coke bottle has a narrow neck.

(19) A green bottle has a narrow neck.

Finally, sentences under the scope of a generic quantifier are necessarily stative, either because the generic operator generalizes over an individual variable, or because they are habitual sentences, and the quantifier generalizes over situations. Sentences under the scope of a generic operator therefore can never be episodic. Consequently, if an episodic sentence expresses genericity, it is because it has a kind-referring argument, as illustrated in (20)-(21) where the definite generic is able to refer to the kind 'potato', and the indefinite nominal is not.⁸ This will be our test (iii).

⁶ The sentences, of course, need to be taken in their generic interpretations. As specific definites they are both perfectly OK.

⁷ Sentence from Carlson (1977) who attributes it to Barbara Partee.

⁸ Again, the sentences have to be taken in their generic interpretation. Specific and taxonomic interpretations are always possible. List readings (which may be taken as an instance of the subkind/taxonomic reading) are also possible, as pointed out by an anonymous referee.

(20) The potato was first cultivated in the Andes region of South America.

(21) *A potato was first cultivated in the Andes region of South America.

Test (i) - Behavior with predicates that subcategorize for kinds. Sentences (22) with the definite singular, and sentence (23) with the definite plural are both grammatical with a kind predicate. That shows that both definite DPs are able to denote kinds. This is not true of the indefinite generic (24), nor of the bare numberless (25) or of the bare plural (26).⁹

(22) O panda logo estará extinto.

The-SG panda soon will-be extinct-SG

'The panda will soon become extinct'

(23) Os pandas logo estarão extintos.

The-PL pandas soon will-be extinct-PL

'The panda will soon become extinct'

(24) *Um panda logo estará extinto.

A panda soon will-be extinct- SG

*'A panda will soon become extinct'

⁹ In these examples, and in the rest of the paper, the asterisk and the question mark express judgements for the generic non-taxonomic reading of nominals and not for its other possible readings which may very well be available. The taxonomic reading as in *A (kind of) panda will soon be extinct* will not be addressed in this paper.

(25) *Panda logo estará extinto.
Panda soon will-be extinct-SG
*'Panda will soon become extinct'

(26) *Pandas logo estarão extintos.¹⁰
Pandas soon will-be extinct-PL
'Pandas will soon become extinct'

In object position the pattern is the same: only definites are able to denote kinds in this position (27-28).¹¹ It is important to note that many other readings are possible for these sentences, besides the generic reading which would be equivalent to the English translation of (27). A reading that means 'a kind of mini-skirt' or 'a type of mini-skirt' is also available for the indefinite generic in (29) - it is the so-called *taxonomic reading*. A specific reading is also available for the indefinite in (29). And iterative (sub)kind readings are available for the bare singular (30) and for the bare plural (31).

(27) Mary Quant criou a mini-saia.
Mary Quant created the-SG mini-skirt
'Mary Quant created the mini-skirt'

¹⁰ Both (25) and (26) improve their acceptability if the subject is given a contrastive stress. The role of stress, focus, and topicality will not be addressed in this paper.

¹¹ Dispositional predicates like *gostar* ('like'), *adorar* ('adore') and *detestar* ('hate') pose a problem for this generalization as they accept bare nominals in object position with an apparent kind/generic interpretation. They actually pose a problem for many theories of genericity (for example, Diesing 1992 and Kratzer 1985). I will follow Kratzer (1985) in stating that this type of predicate allows scrambling of its objects at LF where they are placed in the matrix of a generic sentence.

(28) Mary Quant criou as mini-saias.

Mary Quant created the-PL mini-skirts

'Mary Quant created the mini-skirt'

(29) *Mary Quant criou uma mini-saia.

Mary Quant created a mini-skirt

*'Mary Quant created a mini-skirt'

(30) *Mary Quant criou mini-saia.

Mary Quant created mini-skirt

*'Mary Quant created mini-skirt'

(31) *Mary Quant criou mini-saias.

Mary Quant created mini-skirts

*'Mary Quant created mini-skirts'

Test (ii). This test relies on the fact that *kinds must be well-established*. Again, definite DPs (both singular and plural) behave as kind-denoting ((32) and (33)) - the change from a well-established kind to a non-established one makes these sentences very unnatural. The indefinite singular (34), the bare numberless (35) and the bare plural (36) are indifferent to this change. This means that we have generic quantification instead of kind-referring nominal expressions. It is important to remember that specific readings are often possible. These readings are not to be taken into account.

(32) a. A garrafa de Coca tem gargalo estreito.

The-SG bottle of Coke has neck narrow

'The Coke bottle has a narrow neck'

b. ??A garrafa verde tem gargalo estreito.

The bottle green has neck narrow

'The green bottle has a narrow neck'

(33) a. As garrafas de Coca tem gargalo estreito.

The-PL bottles of Coke have neck narrow

'Coke bottles have a narrow neck'

b. ?As garrafas verdes têm gargalo estreito.

The- PL bottles green- PL have neck narrow

'The green bottles have narrow necks'

(34) a. Uma garrafa de Coca tem gargalo estreito.

A bottle of Coke has neck narrow

'A Coke bottle has a narrow neck'

b. Uma garrafa verde tem gargalo estreito.

A bottle green has neck narrow

'A green bottle has a narrow neck'

(35) a. Garrafa de Coca tem gargalo estreito.

Bottle of Coke has neck narrow

'Coke bottles have narrow necks'

b. Garrafa verde tem gargalo estreito

Bottle green has neck narrow

'Green bottles have narrow necks'

(36) a. Garrafas de Coca têm gargalo estreito.

Bottles of Coke have neck narrow

'Coke bottles have narrow necks'

b. Garrafas verdes têm gargalo estreito

Bottles green- PL have neck narrow

'Green bottles have narrow necks'

Test (iii). Arguments with a generic interpretation in episodic sentences are kind-referring. As in the other tests, the singular and plural definite DPs emerge as kind-referring expressions (37 and 38), whereas the indefinite generic (39), the bare numberless (40) and the bare plural (41) are not able to denote kinds.

(37) O automóvel chegou ao Brasil no século XX.

The- SG automobile reached to-the Brazil in-the century XX

'The automobile reached Brazil in the 20th century'

(38) Os automóveis chegaram ao Brasil no século XX.

The-PL automobile reached to-the Brazil in-the century XX

'The automobiles reached Brazil in the 20th century'

(39) *Um automóvel chegou ao Brasil no século XX.

An automobile reached to-the Brazil in-the century XX

*'An automobile reached Brazil in the 20th century'

(40) *Automóvel chegou ao Brasil no século XX.¹²

Automobile reached to-the Brazil in-the century XX

*'Automobile reached Brazil in the 20th century'

(41) *Automóveis chegaram ao Brasil no século XX.¹³

Automobiles reached to-the Brazil in-the century XX

'Automobiles reached Brazil in the 20th century'

We may now state some generalizations about generic expressions in BP:

- (i) Definite generics are kind-referring expressions in Brazilian Portuguese.
- (ii) The indefinite generic, the bare numberless, and the bare plural are not able to denote kinds.
Their genericity must stem from their participating in generically quantified sentences.

¹² Again the bare plural and the bare singular become more acceptable if they are given a contrastive stress.

¹³ Some speakers find this sentence acceptable. I think this is due either to an existential reading, or to the written language character of the bare plural that makes our intuitions about it fuzzy.

I will address the issue of what enables Brazilian Portuguese to make use of generic quantification in so many different ways, and what the differences are among these ways in the rest of the article.

3 The Interpretation of Common Nouns and of the Plural and Singular Morphemes in Brazilian Portuguese

In this section, I claim that common nouns in BP are neutralized for number. I also claim that BP has a SINGular/PLural operator that turns this neutral denotation into an atomic/plural denotation.

Count common nouns are usually interpreted as denoting sets of atomic entities or functions from worlds to sets of atomic entities (cf. the classical Montague 1973, Chierchia 1998b, Link 1983).¹⁴ No distinction is usually made between the denotation of a singular common noun and of a numberless common noun for languages that have a singular-plural morphology. Nevertheless, I will claim that the denotation of numberless count common nouns in Brazilian Portuguese contains both singular and plural entities: it is a neutralization of the singular-plural distinction. If this claim is correct, the idea that common nouns in languages with a singular-plural distinction always denote sets of atoms must be recast. Common noun denotation may be a place where parametric variation occurs.

A common noun like *revista* ('magazine'), for example, has as its denotation all atomic magazines and all sets of any number of magazines. In a universe with just three magazines, the denotation of *revista* is as in (42). Chierchia 1998b proposes this denotation for predicative mass nouns, as he sees the denotation of mass nouns as a neutralization of the singular-plural distinction. It is also the denotation

Link (1983) proposes for plural predicates. So, basically, bare common nouns in BP are claimed to be similar to English bare mass nouns and to English bare plurals.¹⁵

$$\begin{array}{ccccccc}
 & & & & & & \{a,b,c\} \\
 (42) \text{ [[revista]]} & = & \{a,b\} & & \{a,c\} & & \{b,c\} \\
 & & a & & b & & c
 \end{array}$$

But contrary to languages like Chinese or Indonesian that are said to have mass-like denotations for its common nouns, BP has number morphology and no overt classifier system (cf. Krifka 1995, Chierchia 1998b, Chung 2000). In standard BP, number marking in nominals is as in (43), where both the head noun and the determiner get inflected.¹⁶ Since number morphology has semantic import in BP, I propose that number morphemes are operators on the denotation of the head noun as in (44) and (45), where **AT**(omic) is a predicate that is true of all atomic entities (c.f. Link 1983). To make things more concrete, I apply these operators to the common noun *revista* in (46) and (47).¹⁷

¹⁴ I'll remain strictly extensional when dealing with denotations in this paper.

¹⁵ Caveat: One must think of a mass term in terms of Chierchia's proposal, i.e., a term whose denotation is neutral in respect to singular and plural: "... saying that all members of category NP are mass-like does not mean saying that something resembling the mass/count distinction cannot be found ..." (Chierchia 1998: 355).

¹⁶ Actually, in standard BP, almost all lexical items inside a DP get marked for number as below.

'os meus velhos amigos americanos'

The-PL my-PL old-PL friends American-PL

'My old American friends'

¹⁷ Possibly the number operators have scope over the whole NP.

(43) a. a revista
the-SG magazine
'the magazine'

b. as revistas
the-PL magazines
'the magazines'

(44) **SING**(ular) = $\lambda P \lambda x [P(x) \wedge \mathbf{At}(x)]$

(45) **PL**(ural) = $\lambda P \lambda x [P(x) \wedge \neg \mathbf{At}(x)]$

(46) **SING** (revista)
= $\lambda P \lambda x [P(x) \wedge \mathbf{At}(x)]$ (**revista**)
= $\lambda x [\mathbf{revista} (x) \wedge \mathbf{At}(x)]$

(47) **PL** (revista)
= $\lambda P \lambda x [P(x) \wedge \neg \mathbf{At}(x)]$ (**revista**)
= $\lambda x [\mathbf{revista} (x) \wedge \neg \mathbf{At}(x)]$

The result of applying the **PL**(ural) operator to the denotation of a common noun is illustrated in (48) for a world with just three magazines. What we get is the denotation of the common noun stripped of its

atomic individuals.¹⁸ When we apply the **SING**(ular) operator to a common noun, we get the set of atomic individuals in the denotation of the common noun, as is illustrated in (49).

$$(48) \text{ [[PL (revista)]]} = \begin{array}{ccc} & \{a,b,c\} & \\ \{a,b\} & \{a,c\} & \{b,c\} \end{array}$$

$$(49) \text{ [[SING (revista)]]} = \begin{array}{ccc} a & b & c \end{array}$$

That the three indefinites are different as far as their semantic number is concerned can be clearly seen in distributive contexts. The indefinite singular *um chifre* ('a horn') refers to atomic entities (50), the bare numberless *chifre* ('horn') refers to an unspecified number of entities (51), and the bare plural *chifres*

¹⁸ Stripping atoms of the denotation of plural common nouns leads to some traditional problems for a language like English. A sentence like (i), for instance, should become false if only one student came, and this is not the case. Solving this whole issue goes beyond the scope of this article (but see Chierchia 1998a for a proposal). Data from BP seems to support my analysis for the language, though. First, one cannot use the plural form when translating a sentence like (i) to BP. Second, one cannot answer a question in the plural with the singular form (ii).

- (i) No students came.
- (ii) a. Alguns alunos vieram? ('Did any students come?')
Any-PL students came
- (iii) b. ??*Sim, um aluno veio. ('Yes, one student came')
Yes, one student came

('horns') refers to plural entities (52).¹⁹ Collective readings are also possible. (50)-(52) may also mean that unicorns, as a group, have only one horn, an indefinite number of horns, or more than one horn.

(50) Unicórnio tem um chifre.

unicorn has a horn

'Unicorns have a/one horn'

(51) Unicórnio tem chifre.

unicorn has horn

'Unicorns have (an unspecified number of) horns'

(52) Unicórnio tem chifres.

unicorn has horns

'Unicorns have (more than one) horns'

Actually, the interesting thing about these constructions is that all types of indefinite subjects go with all types of indefinite objects as shown in (53)-(55). The effect of number remains the same as above so that for the indefinite singular each unicorn has one horn, for the bare numberless, each unicorn has an

¹⁹ A referee has pointed out that the effect on number in these sentences might be due to the verb *ter* (*have*). Most syntacticians would assume a small clause analysis with *ter* as a raising predicate (cf. Kayne 1993, Hornstein *et al.* 1994). Nevertheless, the effect on number in distributive readings remains the same with other kinds of verbs as in the example below.

'Um intelectual/intelectual/intelectuais escreve(m) um artigo/artigo /artigos todo dia.'

An intelectual/intelectual/intelectuals writes(-PL) an article/article/articles every day

unspecified number of horns and for the bare plural, each unicorn has more than one horn.²⁰ The data in (53)-(55) also shows that this is not just a syntactic phenomenon related to agreement.

(53) Um unicórnio tem um chifre/chifre/chifres.

A unicorn has a horn /horn / horns

'Unicorns have horns'

(54) Unicórnio tem um chifre/chifre/chifres.

Unicorn has a horn /horn /horns

'Unicorns have horns'

(55) Unicórnios têm um chifre/chifre/chifres.

Unicorns have a horn /horn /horns

'Unicorns have horns'

Some other arguments for the bare numberless being taken as non-quantized in BP come from Schmitt and Munn (1999). According to them, some of the evidence for lack of number in bare numberless nominals in BP comes from aspectual interpretations of sentences. They point out that properties of the direct object are known to affect the Verb Phrase aspect so that *quantized objects* trigger *terminative readings* in verbs like *write*, while *non-quantized objects* trigger *durative readings* (cf. Verkuyl 1972). Interestingly, bare singulars only allow for durative readings.

²⁰ Of course, collective readings are also possible. I will not consider them.

The behavior of the bare numberless and of the bare plural in sentences (56) and (57) is evidence for their being non-quantized. Both denotations are unspecified for the cardinality of each entity that belongs to it, but the denotation of the bare plural excludes atomic entities. The adverbial phrase *for two hours* forces a durative reading on (56) and the sentence comes out good. On the other hand, the same sentence with the terminative adverbial phrase as *in two hours* becomes extremely awkward (57).²¹

(56) Eu escrevi carta/cartas por duas horas.

I wrote letter/letters for two hours - (an unspecified number of letters)

(57) *Eu escrevi carta/cartas em duas horas.²²

I wrote letter/letters in two hours

Another evidence presented by Schmitt & Munn (1999) is that in the licensing of *cada* ('each') the bare numberless and the bare plural pattern as semantically unspecified for number. The grammaticality of the sentence with a full DP in (58) as opposed to the ungrammaticality of the sentence with the bare nouns in (59) shows that they do not denote well defined quantities.²³

(58) Os países da UE mandaram um/dois/vários delegado(s) cada.

The countries of-the UE sent a /two /various delegate(s) each

'The EU countries sent a/two/various delegate(s) each'

²¹ These tests are Dowty's 1979.

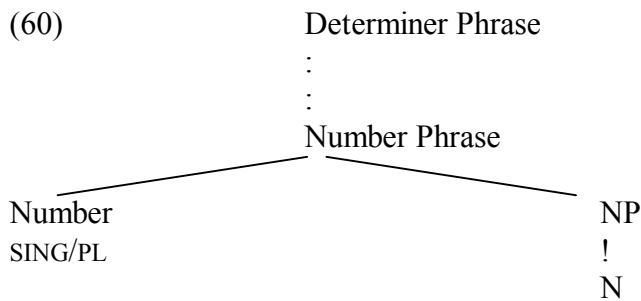
²² This sentence becomes acceptable if it receives some kind of iterative reading, as the following: *Eu estava tão ocupada naquela época que eu preparava aula em uma hora* ('I was so busy then that I used to prepare-class in one hour').

²³ I thank an anonymous referee for pointing the alternatives in (58) out to me.

- (59) *Os países da UE mandaram delegado/delegados cada
 The countries of-the UE sent delegate /delegates each
 *'The EU countries sent delegate(s) each'

Number, in my proposal, is a semantic operation on the denotation of the common noun. But number is also a syntactic phenomenon. This raises questions about the implications of this proposal for the syntax of the DP in Brazilian Portuguese.

Since the work of Abney (1987), the nominal phrase has been analyzed as having a structure similar to the structure of the sentence. Many projections such as gender, number and classifier phrases may be embedded within a full DP. The semantics of number proposed in this section is compatible with a syntactic structure in which number has scope over the NP such as the one presented in (60).²⁴



I will next address the differences among the generic interpretations of the three types of indefinite expressions in BP.

²⁴ The whole set of syntactic consequences of this proposal is outside the scope of this article. But see Schmitt & Munn 1999 for a proposal on the structure of the DP and on the role of the Number Phrase in BP.

4 Indefinites Participating in Characterizing Sentences in Brazilian Portuguese

This section outlines an analysis of indefinites under the scope of the GEN(eric) operator. The section is also to be taken as evidence in favor of the proposal that BP common nouns have a mass-like denotation. I will investigate the ways in which Brazilian Portuguese expresses generic quantification with the indefinite DP, the bare numberless and the bare plural in view of the proposal that common nouns are unmarked for number in the language and of the existence of a SING(ular)-PL(ural) operator in the language.

The generic indefinite in (61) seems to refer to the whole set of entities or to the kind denoted by its head noun 'lion'. It does not refer to any particular lion and it does not have an existential reading as a Russellian analysis would predict.

(61) A lion weighs 200 pounds.

Generic indefinites are not real kind-referring expressions though, because they are not able to denote kinds. First, they only occur in generically quantified sentences (compare 62 to 63). Second, they cannot be used with predicates that apply only to kinds (compare 64 to 65). Finally, they cannot be used with episodic predicates (compare 66 to 67).

(62) The potato was first cultivated in South America.²⁵

(63) *A potato was first cultivated in South America.²⁶

²⁵ Sentences (63)-(67) are from Krifka *et al.* 1995.

- (64) Graham Bell invented the telephone.
- (65) *Graham Bell invented a telephone.
- (66) The rat was reaching Australia in 1970.
- (67) *A rat was reaching Australia in 1970.

If the indefinite generic, the bare numberless and the bare plural are all 'normal' heimian indefinites in Brazilian Portuguese, they get their generic meaning from the fact that they are participating in characteristic sentences where their variable gets bound by the GEN(eric) operator. This being the case, the sentences in which they participate have logical forms as in (68)-(70).

- (68) a. Um brasileiro é trabalhador.
 b. **GEN [x;] (x is a brazilian; x is hardworking)**
 'Usually, if x is a Brazilian, x is hardworking'
- (69) a. Brasileiro é trabalhador.
 b. **GEN[x;] (x is brazilian; x is hard working)**
 'Usually, if x is Brazilian, x is hardworking'
- (70) a. Brasileiros são trabalhadores.
 b. **GEN[x;] (x are brazilians; x are hard working)**
 'Usually, if x are Brazilians, x are hardworking'

²⁶ The asterisk, as before, indicates semantic and not syntactic ill-formedness. Actually, it only means that these sentences cannot be interpreted as straightforward generics equivalent to (62), (64) and (66). They could be understood as generics under the 'shifted' reading 'one kind of N'.

Now the question arises of what the differences are among the interpretations of (68)-(70) and how the three generic interpretations of the indefinite expressions relate to one another. If my proposal for the denotation of common nouns in BP is on the right track, the three forms are different as far as their semantic number is concerned. Sentence (68) generalizes over atomic Brazilians, sentence (69) over both atomic and plural Brazilians, and sentence (70) only over pluralities of Brazilians. The effects on meaning are subtle and hard to grasp in subject position, so we will look at the same phenomena in object position.

Sentences (71)-(73) are habitual sentences where **GEN** has scope over a situation variable and the variable of the indefinites gets bound by an existential quantifier. As far as my intuition goes, (71) would be false or at least not felicitous if in most after-dinner situations Jorge read more than one magazine. And (72) comes out true if Jorge usually reads one or more magazines after dinner. (73) would be false if Jorge usually read only one magazine after dinner. Of course, as most generic sentences, these allow for exceptions. So that if Jorge read more than one magazine on occasional situations, (71) would still count as true. The same holds for (73). If once in a while Jorge read no magazines or if he read just one magazine after dinner instead of his usual two or three, the sentence would still count as true. The corresponding logical forms of sentences (71a)-(73a) are in (71b)-(73b) (c.f. Krifka *et al.* 1995).

(71) a. Depois do jantar, Jorge lê uma revista.

After PREP-the dinner, Jorge reads a magazine²⁷

'After dinner, Jorge reads a magazine' - one magazine

b. **GEN[s;x]** (Jorge is in s \wedge s is after dinner; x is a magazine \wedge Jorge reads x in s)
 = **GEN[s;]** (Jorge is in s \wedge s is after dinner; $\exists x$ (x is a magazine \wedge Jorge reads x in s))

(72) a. Depois do jantar, Jorge lê revista.

After PREP-the dinner, Jorge reads magazine

'After dinner, Jorge reads magazines' - one or more magazines

b. **GEN[s;x]** (Jorge is in s \wedge s is after dinner; x is magazine \wedge Jorge reads x in s)

= **GEN[s;]** (Jorge is in s \wedge s is after dinner; $\exists x$ (x is magazine \wedge Jorge reads x in s))

(73) a. Depois do jantar, Jorge lê revistas.

After PREP-the dinner, Jorge reads magazines

'After dinner, Jorge reads magazines' - more than one magazine

b. **GEN[s;x]** (Jorge is in s \wedge s is after dinner; x are magazines \wedge Jorge reads x in s)

= **GEN[s;]** (Jorge in s \wedge after dinner s; $\exists x$ (x are magazines \wedge Jorge reads x in s))²⁸

Let's now relate the interpretations in (71b)-(73b) to the interpretation of common nouns, and to the singular and plural operators proposed for BP in section 3. As said before, common nouns have denotations that are neutral with respect to the singular-plural/ atomic-non-atomic distinction. In other

²⁷ PREP = preposition.

²⁸ The logical forms in (71) and (72) yield the same truth conditions for both the sentences with the indefinite generic and the bare numberless. This seems to be a well known problem concerning cardinals. I will assume that the differences in interpretation are due to pragmatic effects.

words, the denotation of a count common noun in BP contains all atomic individuals and all the plural individuals of which that predicate may be said true of.

I will assume a Heimian indefinite article that is obligatorily specified for number. This means that whenever we have an article, the number operator has applied to the nominal constituent under its scope (possibly NP). Consequently the logical form of *uma revista* ('a magazine') is as in (74).

$$\begin{aligned}
 (74) \quad & \textit{uma revista} = (\text{SING}(\textit{revista})) \\
 & = (\lambda P \lambda x [P(x) \wedge \text{At}(x)](\textit{revista})) \\
 & = \lambda x [\textit{revista}(x) \wedge \text{At}(x)]
 \end{aligned}$$

If we substitute (74) for *uma revista* in the logical form of sentence (75a) we get the logical form in (75b).²⁹ (75b) says that Jorge usually reads one magazine after dinner. This logical form is faithful to the truth-conditions of the sentence.

$$\begin{aligned}
 (75) \quad & \text{a. Depois do jantar, Jorge lê } \textit{uma revista}. \\
 & \text{b. GEN}[s;](\text{Jorge in } s \wedge \text{after dinner}; \exists x (\lambda x [\textit{revista}(y) \wedge \text{At}(y)](x) \wedge \text{Jorge reads } x \text{ in } s)) \\
 & = \text{GEN}[s;](\text{Jorge in } s \wedge \text{after dinner } s; \exists x (\textit{revista}(x) \wedge \text{At}(x) \wedge \text{Jorge reads } x \text{ in } s))
 \end{aligned}$$

The interpretation of the bare numberless and of the bare plural in quantified sentences are built in the same way and are also faithful to their truth-conditions. The sentence with the bare numberless says that

²⁹ Note that the existential operator is taken to be able to apply both to singular and plural entities.

Jorge reads an indefinite number of magazines after dinner. And the sentence with the bare plural says that he usually reads more than two magazines after dinner.

In this section, we have seen that generic indefinites in Brazilian Portuguese - the indefinite generic, the bare numberless and the bare plural - are Heimian indefinites under the scope of a GEN(eric) operator. The semantic differences among the three forms are accounted for by analyzing count common noun denotations in BP as neutralized for number and positing the existence of a SING(ular)/PL(ural) operator that turns these denotations into atomic/plural denotations.

5 Final Comments

Genericity in BP, as in many other languages, makes use of two different devices: generic quantification and kind-referring expressions. The generic indefinite, the bare numberless and the bare plural are Heimian indefinites in BP. When in generic sentences, they are not kind-referring expressions, but indefinites that get their variables bound by a generic operator. Singular and plural definite generics, on the other hand, are kind-referring expressions.

The three indefinites are different in their semantic number. DPs with the singular indefinite article have only atoms in their denotations, bare numberless nominals have number neutral denotations and bare plural nominals only denote pluralities. This difference is claimed to derive from: (i) the fact that in BP common noun denotations include both atomic and plural entities, and (ii) the existence of both a singular and a plural number operator in the language. The singular operator picks out the atoms of the denotation of a NP, whereas the plural operator strips the denotation of a NP of its atomic entities.

Much more work needs to be done to get a full picture of where BP stands in relation to crosslinguistic variation on the expression of genericity. Chierchia 1998b presents a typology of languages. According to him, languages vary as to how the categories of common noun and DP are mapped onto their denotations. His Nominal Mapping Parameter states that bare maximal projections may be predicative or argumental. Based on the evidence presented in this paper, one could say that, in spite of its atypical behavior as far as number is concerned, BP still pairs with Romance languages in that common nouns are always predicative in the language.³⁰

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³⁰ Based on crosslinguistic data from Italian, French and Spanish, Longobardi (1999) concludes that generic indefinites in Romance languages are always predicative.

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