

The morpho-semantics of number in Brazilian Portuguese bare singulars

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Abstract

In this paper, I provide evidence against the idea that bare singulars in Brazilian Portuguese (BP) are morphologically singular but semantically number neuter. I argue instead that they are sometimes specified for number (singular) and sometimes under-specified and that this has semantic consequences. I develop an account according to which whether or not a bare noun can enter a syntactic derivation under-specified for number depends on the functional heads to which it is syntactically related. The conclusion is that, as far as number is concerned, morpho-syntactic specification should NOT be kept apart from semantic interpretation.

1. Introduction*

Brazilian Portuguese allows bare singular count noun phrases in argument positions, as shown by the following examples:

- (1) Maria leu revista no consultório médico.
Maria read magazine at-the office doctor
'Mary read a magazine/magazines at the doctor's office'.

* Parts of this work were presented at Universidade Federal de Santa Catarina (Workshop on Indefinites and Bare Nouns), Universidade de São Paulo, Université de Paris 7, and Institut Jean Nicod ("Genericity Interpretation and Uses" Seminar). I would like to thank these audiences for comments and suggestions, specially Carmen Dobrovie-Sorin, Alan Munn, Jairo Nunes, Cristina Schmitt, and Roberta Pires de Oliveira. I am also grateful to two anonymous reviewers for suggestions that helped me improve the original manuscript. All remaining errors are mine.

- (2) Cachorro come gato.
 dog eats cat
 ‘Dogs eat cats.’

(1) is an episodic sentence with a bare singular NP occupying the object position. (2) is a generic sentence with bare singulars in both subject and object positions. In this article, our focus will be on the use of bare singulars in episodic sentences, in which they receive an existential interpretation, roughly equivalent to ‘there is one or more’ or ‘there is at least one’.¹

A common intuition about BP bare singulars in episodic sentences is that they are morpho-syntactically singular but semantically neuter (cf. Schmitt and Munn, 1999; Munn and Schmitt, 2005; Müller, 2002; Müller and Oliveira, 2004, among others). The source for this intuition is highlighted in the examples below:²

- (3) Tem amigo meu que está desempregado.
 has friend my that is unemployed
 ‘There is/are a friend/friends of mine who is unemployed.’
- (4) Maria comprou CD na Fnac. Ele/s está/estão no carro.
 Mary bought CD at Fnac it/they is/are in-the car
 ‘Mary bought a CD/CDs at Fnac. It/they is/are in her car.’

In (3), we notice the absence of plural morphology on the bare noun and its possessive modifier and also the presence of singular morphology on the verb of the subject relative clause attached to the bare noun. In (4), the bare singular in the first sentence can serve as the antecedent of either a singular or a plural pronoun appearing on the subsequent discourse. These facts have been taken as evidence that despite being morphologically singular, BP bare singulars are semantically neuter, being able to introduce both atomic and non-atomic discourse referents.^{3,4}

¹ There are syntactic restrictions affecting the distribution of bare singulars in episodic sentences that will not be discussed in this paper. For instance, bare singulars cannot appear as the subject of finite clauses under an episodic reading. The restriction does not apply to generic contexts, as attested in (2). This is, per se, an interesting topic. Further research is necessary to tell what the impact of this and related matters is to the points to be made in this paper.

² Due to number neutrality, it is hard to give appropriate and concise English translations to the BP sentences containing bare singulars. Although it may affect readability a little bit, I decided to translate the bare nouns and related agreement morphology in pairs, such as a ‘friend/friends’.

³ In this paper, the term number neutrality should be understood as follows: an NP is number neutral if its denotation contains both atomic and non-atomic entities.

⁴ As pointed out by an anonymous reviewer, a different logical possibility is that BP has a number system with three categories – neuter, singular and plural – with neuter and singular being homophonous. Although this is certainly compatible

However, one should be careful when evaluating this evidence. Plural discourse anaphora is possible even in the absence of a plural antecedent, as the following example attests:⁵

- (5) Todo menino comeu uma maçã. Elas estavam ótimas.
 every boy eat an apple they were great

Here, the plural pronoun *elas* refers to the apples eaten by the boys. Of course, there are differences between (4) and (5). For instance, the singular indefinite is under the scope of a universal quantifier in the latter but not in the former, but for the moment the example suffices to raise a warning flag and point out that it is not obvious that the bare singular in (4) should be semantically neuter or plural to license the plural pronoun. We will return to this point in section 7.⁶

Moreover, semantic neutrality is not enough to legitimate morphological mismatches in discourse anaphora. Consider the following case:

- (6) Tem criança na sala. Ela/*Ele está chorando.
 has child in-the room she/he is crying
 ‘There is/are a child/children in the room. She/he is crying.’

The noun *criança* is morphologically feminine in BP, but semantically neuter, being able to refer to both boys and girls. However, it can only serve as the antecedent for feminine pronouns. As shown above the use of a

with the data presented so far, we will see throughout this paper some evidence that certain instances of bare singulars should be treated as genuine singular NPs, in the sense of having only atomic entities in their denotations.

⁵ Schmitt and Munn (1999) acknowledge this point. See, in this respect, the work of Evans on e-type pronouns (Evans, 1980) and Kamp and Reyle’s (1993) process of abstraction. More on this topic in section 7.

⁶ Discourse anaphora is a complex topic and many non-trivial examples can be constructed linking pronouns to noun phrases that have been previously mentioned. For instance, Krifka et al. (1995) present cases in which kind referring pronouns are linked to existential indefinite NPs that introduce individual referents into the discourse. Even more indirect links exist between noun phrases and pronouns, as the following example provided by an anonymous reviewer shows:

(i) Natal é uma cidade especial. Eu construí uma relação muito boa com eles.
 Natal is a city special I built a relation very nice with them
 ‘Natal is a very special city. I built a very nice relationship with them.’

Here the pronoun *them* is linked to the proper noun *Natal* (a city in Brazil) and seems to refer to its inhabitants. What examples like this reveal is that noun phrases can introduce/activate several kinds of discourse referents, some of them only indirectly related to the NP denotation. In section 7, I will briefly discuss what kind of connection might be responsible for the relation between bare NPs and pronouns in examples such as (4) and (5).

masculine pronoun is infelicitous in this case.⁷ This prohibition against gender mismatches does not seem to apply to number mismatches, as confirmed by (7) below:

- (7) Tem criança na sala. Elas estão chorando.
 has child in-the room they are crying
 ‘There is/are child/children in the room. They are crying.’

If both (6) and (7) are cases of feature mismatch across sentences, why then is (6) bad, but (7) fine?

The goal of this paper is to argue that BP bare singulars are sometimes morpho-syntactically unspecified for number and sometimes fully specified for number (sg). Crucially, I will also argue that whether or not bare singulars enter a syntactic derivation specified for number has semantic consequences. In other words, the morpho-syntactic facts should not be kept apart from the semantic facts: with respect to number, morpho-syntactic under-specification equals semantic under-specification.⁸

⁷ This constraint against gender mismatches seems to be a very strong one. As shown by the following example (due to an anonymous reviewer), even when the context makes it clear that the child under discussion ought to be a boy, only the feminine pronoun is allowed:

- (i) Tem criança sendo submetida a uma operação de circuncisão. Ela/*ele está chorando. crying
 ‘There is/are a child/children undergoing a circumcision procedure. She/he is crying.’

⁸ An additional piece of evidence that has been presented in favor of the number neutrality of BP bare singulars comes from the following example from Munn and Schmitt (2005):

- (i) Eu escrevi carta por muitos anos/*em uma hora
 I wrote letter for many years/in one hour
 ‘I wrote letters for many years.’

According to the authors, “the data above suggest that bare singulars have no specification for number”. But one can also construct minimal variations in which the bare singular can co-occur with a *in*-adverbial. (ii) below seems just fine:

- (ii) Eu já vi o João escrever carta em um minuto.
 I already saw the John write letter in one minute
 ‘I saw John write a letter in one minute.’

The data above seem to suggest that bare singulars MAY have no specification for number, but as an anonymous reviewer pointed out, it is far from obvious how to account for the contrast between (i) and (ii). Moreover, as another anonymous reviewer noticed, the bare noun in (i) is interpreted as one or more letters, whereas in (ii) it is interpreted as a single letter. This interaction between plurality and aspect is an interesting but intricate topic, which I leave for future work.

The rest of the paper is organized as follows. In section 2, I present data showing that bare singulars in BP are not always number neutral, and that under certain circumstances they are not compatible with plural interpretations. In section 3, I lay out some general assumptions concerning the interpretation of number features on both NPs and functional heads. In section 4, I discuss the number specification of nominal and functional heads in BP. In section 5, I explore the consequences of these assumptions when applied to BP bare nouns and show how they can account for the data presented in section 2. In section 6, I extend the analysis to full nominal phrases, that is, to cases in which an NP is not bare, but covered by a determiner projection. In section 7, I revisit the cases of discourse anaphora, paying attention to the dynamic behavior of bare singulars. Section 8 is a brief conclusion.

2. Data

If bare singulars are semantically neutral with respect to number and contain both atomic and non-atomic entities in their denotations, they should be able to combine with certain expressions (or appear in certain environments) that require the presence of non-atomic arguments to trigger group-oriented interpretations. In this section, we will discuss three such expressions (environments) and compare the behavior of bare singulars and bare plurals to check whether or not these plural interpretations arise.

2.1. Anaphoric *se*

The clitic form *se* in BP, when used as an anaphoric pronoun, can give rise to both reflexive and reciprocal interpretations, as illustrated in (8):

- (8) Os alunos se elogiaram.
the-masc/PL students SE praised-3PL
'The students praised themselves/each other.'

This sentence can be used to talk about a group of students each of which praised himself or about a group whose members praised one another. As one might expect, in order for a reciprocal reading to arise, SE should have an antecedent that denotes a plurality. If its potential antecedent denotes a single individual, only the reflexive reading will show up:

- (9) O aluno se elogiou.
the-masc-SG student SE praised-3SG
'The student praised himself/*each other.'

Consider now what happens when bare nouns are used in similar environments:

- (10) a. *Eu vi alunos se elogiando.*
 I saw students SE greeting
 ‘I saw students praising themselves/each other.’
- b. *Eu vi aluno se elogiando.*
 I saw student SE praising
 ‘I saw a student/students praising himself/themselves/each other.’

Both (10a) and (10b) have reciprocal readings. In the case of (10a) this is as it should be since the antecedent of SE is a bare plural. As for the case of (10b), it gives further support to the view that bare singulars are semantically neuter with respect to number. Just like (10a), it can be used to talk about students who were praising one another.

Consider now the following pair, again contrasting a bare plural and a bare singular:

- (11) a. *Eu vi alunos que estavam se elogiando.*
 I saw students that were SE praising
 ‘I saw students who were praising themselves/each other.’
- b. *Eu vi aluno que estava se elogiando.*
 I saw student that was SE praising
 ‘I saw a student/students who was/were praising himself/themselves.’

Here, only (11a) has a reciprocal reading. (11b) has only a reflexive one. The contrast becomes sharper if we use a predicate that disfavors a reflexive reading:

- (12) a. *Eu vi alunos que estavam se cumprimentando.*
 I saw students that were SE greeting
 ‘I saw students who were greeting themselves/each other.’
- b. *Eu vi aluno que estava se cumprimentando.*
 I saw student that was SE greeting
 ‘I saw a student/students who was/were greeting himself/themselves.’

Once again, only the version with a bare plural has a reciprocal reading, whereas the version with a bare singular has only a (weird) reflexive reading.

Notice already that the contrasts in (11) and (12) are unexpected if bare singulars are neuter for number. They should trigger reciprocal (as well as reflexive) readings in both cases and no salient difference between bare plurals and bare singulars should be attested.⁹

⁹ Notice that the examples above (as well as many others that will appear in the rest of the paper) use relative clauses. An anonymous reviewer brought up the issue of whether the conclusion that bare nouns are not always neutral depends or not on a raising analysis of relative clauses (see Vergnaud, 1974; Kayne, 1994; Bianchi, 1999, among others. See also Kato and Nunes, 2009, for Brazilian Portuguese). Under such an analysis, the bare noun would move from within the relative clause in (11) and (12). Given the contrast in (12), the natural conclusion is that the bare

I will offer an account for the contrasts above in the next sections. What I would like to point out now is a difference between the examples in (10) and the ones in (11)/(12) that will turn out to be crucial to the explanation of these contrasts.

In (10), bare nouns are the (subject) argument of a gerundive verbal form. Gerunds in BP do not inflect for number (or person). Therefore, the same verbal form is used with bare singulars and bare plurals. On the other hand, in (12) the bare nouns (or the corresponding relative pronouns) are related to the subject position of a finite verbal form. Finite forms do inflect for number in BP, and, as shown in the examples, different forms surface depending on whether we have singular or plural subjects. As I mentioned above, this difference will be crucial to my proposal about the morpho-semantics of BP bare nouns. For the moment, let us look at some more examples highlighting the same point:

- (13) a. *Tinha alunos se abraçando.*
 had-3sg students SE hugging
 ‘There were students hugging themselves/each other.’
- b. *tinha aluno se abraçando.*
 had-3sg student SE hugging
 ‘There was/were a student/students hugging
 himself/themselves/each other.’
- (14) a. *Tinha alunos que estavam se abraçando.*
 had-3sg students that were SE hugging
 ‘There were students who were hugging themselves/each other.’
- b. *Tinha aluno que estava se abraçando.*
 had-3sg student that was SE hugging
 ‘There was a student/students who was hugging himself/
 themselves.’

singular in (12b) is indeed singular. However, as the reviewer pointed out, under a null operator analysis one could maintain that bare Ns are always number neutral and blame a singular null operator for the absence of plural interpretations in (11b) and (12b). Notice, however, that since the interpretation of the bare noun and the interpretation of the relative clause combine intersectively, the interpretation of the resulting bare NP (N+Relative Clause) would still be singular. That this is indeed the case is confirmed by the absence of a reciprocal interpretation for (i):

- (i) *Eu vi [[criança que estava sentada] se beijando].*
 I saw child that was seated SE kissing

In this example, it is the bare NP that cannot serve as the subject of the reciprocal predicate. Thus, even if the examples in the text do not necessarily lead to the conclusion that bare Ns are singular, they do lead to the conclusion that bare NPs are (sometimes) singular. Many thanks to an anonymous reviewer who urged me to clarify these issues.

- (15) a. Eu li livros que se completam.
I read books that SE complete-3pl
'I read books that complete themselves/each other.'
- b. Eu li livro que se completa.
I read book that SE complete-3sg
'I read a book/books that complete(s) itself/themselves.'

These examples show the same pattern: reciprocal interpretations become unavailable for bare singulars when they are (or are related to) subjects of finite verbal forms. No such restriction is observed with bare plurals.

2.2. Cumulative Interpretations

Consider the following sentences:

- (16) a. Tem amigos meus morando em muitos países.
has friends my-pl living in many countries
'There are friends of mine living in many countries.'
- b. Tem amigo meu morando em muitos países.
has friend my-sg living in many countries
'There is/are a friend/friends of mine living in many countries.'

Both sentences have what may be called a cumulative interpretation. According to this interpretation, no friend of mine has to be living in many countries. What is required for the sentence to be true is that there is one or more friends of mine and a set of many countries, and each one of these countries is the residence of at least one such friend of mine. In other words, the sentence can be used to talk about a group of 15 friends of mine and a group of 15 countries, with each one of these friends living in a different country.

Consider now another pair of sentences:

- (17) a. Tem amigos meus que moram em muitos países.
has friends my-pl that live in many countries
'There are friends of mine who are living in many countries.'
- b. Tem amigo meu que mora em muitos países.
has friend my-sg that lives in many countries
'There is/are a friend/friends of mine who is/are living in many countries.'

Notice that we have replaced the gerundive forms in (16) with subject relative clauses with finite verbs in (17). Interestingly, only (17a), in which a bare plural is related to the finite verb, has a cumulative interpretation. (17b), with a bare singular, requires (at least) one friend of mine to be living in many countries.

Let us now replace the original gerundive form with a participle form:¹⁰

- (18) a. Eu tenho amigos exilados em muitos países.
 I have friends exiled-pl in many countries
 ‘There are friends of mine exiled in many countries.’
 b. Eu tenho amigo exilado em muitos países.
 I have friend exiled-sg in many countries
 ‘There is/are a friend/friends of mine exiled in many countries.’

Here, only (18a) has a cumulative interpretation. (18b) requires some friend(s) of mine to be in many countries. This contrast is similar to the contrast observed above in (17) with finite relative clauses. Indeed, replacing the participial forms with finite relatives will not change the contrast:

- (19) a. Eu tenho amigos que se exilaram em muitos países.
 I have friends that se exiled-3pl in many countries
 ‘There are friends of mine who exiled in many countries.’
 b. Eu tenho amigo que se exilou em muitos países.
 I have friend that se exiled-3sg in many countries
 ‘There is a friend/friends of mine who exiled in many countries.’

Once again, only (19a) has a cumulative interpretation. (19b) requires some friend(s) of mine to be in many countries.

Crucially, participial verbal forms in Portuguese inflect for number (*exilado/exilados*), patterning thus with finite verbs and not with gerunds. We are facing the same contrast we had seen above with respect to anaphoric *se*: an overt morpho-syntactic agreement seem to (indirectly) correlate with semantic contrasts concerning the number interpretation of bare nouns.

2.3. *mesmo* (‘same’)

Our last group of examples concerns the word *mesmo* (‘same’). This word can have both an anaphoric and a group-internal reading, illustrated below:

- (20) Maria trabalha em um projeto. João trabalha no mesmo projeto.
 Maria works in a project João works in-the same project
 ‘Mary works in a project. John works on the same project.’
 (21) João e Maria trabalham no mesmo projeto.
 João e Maria work in-the same project
 ‘John and Mary work on the same project.’

¹⁰ When testing judgments, it is important that a pause be inserted between the bare noun and the participle in order to make it clear that we are dealing with a (short) relative clause and not a simple Noun-Adjective sequence.

(20) illustrates the anaphoric reading. The second sentence says that John works in a project that has already been mentioned in the discourse, namely, the project on which Mary works. (21) illustrates the group-internal reading. Both John and Mary are currently working in a single project. It is also compatible with an anaphoric interpretation. For instance, if what is being discussed is Pedro's current project, then (21) can mean that John and Mary are both working in that project too. Of course, when uttered out of the blue, the anaphoric interpretation of (21) vanishes due to the absence of an appropriate discourse antecedent.

It should be clear that in order for the group-internal reading to arise, *mesmo* must relate to a group-denoting argument, such as a coordinating DP (John and Mary) or a plural definite (the employees). Otherwise, only the anaphoric reading will be available. In the second sentence in (20), for instance, *mesmo* only has an anaphoric reading. (21), on the other hand, has both a group-internal and an anaphoric interpretation, as I have just pointed out.

Bearing this in mind, consider the following sentences:

- (22) a. Eu vi alunos trabalhando no mesmo projeto.
I saw students working on-the same project
'I saw students working on the same project.'
- b. Eu vi aluno trabalhando no mesmo projeto.
I saw student working on-the same project
'I saw a student/students working on the same project.'

In both sentences, *mesmo* has an anaphoric and a group-internal reading. Substituting a bare singular for a bare plural makes no salient difference in interpretation.

The situation changes when we replace gerunds with finite subject relative clauses:

- (23) a. Eu vi alunos que estavam trabalhando no mesmo projeto.
I saw students that were working on-the same project
'I saw students who were working on the same project.'
- b. Eu vi aluno que estava trabalhando no mesmo projeto.
I saw student that was working on-the same project
'I saw a student/students who was/were working on the same project.'

In this case, only in (23a) *mesmo* has a group-internal reading. (23b) can only be interpreted as saying that the student(s) that I saw were working in a project that had been previously mentioned in the discourse.

Below is another example:

- (24) a. Tem convidados dormindo no mesmo quarto.
 has guests sleeping in-the same room
 ‘There are guests sleeping in the same room.’
 b. Tem convidado dormindo no mesmo quarto.
 has guest sleeping in-the same room
 ‘There is a guest/guests sleeping in the same room.’
- (25) a. Tem convidados que estão dormindo no mesmo quarto.
 has guests that are sleeping in-the same room
 ‘There are guests who are sleeping in the same room.’
 b. Tem convidado que está dormindo no mesmo quarto.
 has guest that are sleeping in-the same room
 ‘There is a guest/guests who is/are sleeping in the same room.’

In (24), both sentences allow for a group-internal reading, whereas in (25), only the version with a bare plural allows for such reading.

Another contrast that is revealing is one in which bare singulars are used as the subject of a gerundive active verbal form and also of a gerundive passive verbal form, as shown below:

- (26) a. Eu vi convidado dormindo no mesmo quarto.
 I saw guest sleeping in-the same room
 ‘I saw a guest/guests who were sleeping in the same room.’
 b. Eu vi convidado sendo posto no mesmo quarto.
 I saw guest being put-sg in-the same room
 ‘I saw a geust/guests who was/were being put in the same room.’

The relevant fact is that only in (26a) can we have a group-internal interpretation. Notice in (26b) the presence of the passive participle *posto*, which is inflected for number. If instead of a bare singular we had a bare plural, reciprocal readings would be possible in both sentences:

- (27) a. Eu vi convidados dormindo no mesmo quarto.
 I saw guests sleeping in-the same room
 ‘I saw guests who were sleeping in the same room.’
 b. Eu vi convidados sendo postos no mesmo quarto.
 I saw guest being put-pl in-the same room
 ‘I saw guests who were being put in the same room.’

The lack of contrast in (22),(24), and (27), and the presence of a contrast in (23), (25), and (26) point once more to the relevance of morpho-syntactic overt agreement to the number interpretation of bare nouns. Replacing a bare singular with a bare plural triggers a different interpretation when finite and

(adjectival) participial verbal forms are involved, but not when (only) gerundive forms are.

2.4. Interim Summary

The pattern that emerges from the data presented in this section can be summarized as follows:

- When argumental bare singulars are syntactically related to verbal forms carrying singular morphology, “plural” interpretations are blocked.
- When argumental bare singulars are syntactically related to verbal forms carrying no number morphology, “plural” interpretations are allowed.

These are the generalizations that I will try to explain in the next sections.

At this point, it is important to check whether the absence of plural interpretations discussed above correlates not with the denotation of bare nouns, but rather with the presence of overt singular morphology, as the generalizations above might seem to suggest. If this is the case, plural interpretations should not be available when singular verbal forms combine with group-denoting, singular arguments, as in (28) below. However, as the glosses make clear, this is not what one observes:

- (28) A *criançada* se abraçou.
 The bunch-of-children SE hugged-3sg
 ‘The (bunch of) children hugged each other.’

The word *criançada* is a group denoting expression meaning ‘bunch of children’.¹¹ In (28), the word is singular and triggers singular morphology on the verb. Nevertheless, a reciprocal interpretation is readily available to the sentence. Other singular expressions that are group denoting behave the same way:

- (29) Um grupo de mulheres se abraçou.
 a group of women SE hugged-3sg
 ‘Some (group of) women hugged each other.’
- (30) A maioria das mulheres se abraçou.
 the majority of women SE hugged-3sg
 ‘Most women hugged each other.’

¹¹ *-ada* is a suffix roughly meaning ‘bunch of’ which is relatively productive in Brazilian Portuguese and usually carries a somewhat derogatory meaning, as in *brasileirada* (‘bunch of brazilians’).

What the data above suggests is that singular verbal morphology per se does not block plural readings of their agreeing subjects. Therefore, the reason behind the asymmetries found in the previous section between bare singulars and bare plurals should lie elsewhere, most likely on the denotation of these bare nouns. This is the road I will take on the following sections.¹²

3. On the Interpretability of Number Features

In this section, I lay out some assumptions regarding the interpretation of number features on noun phrases and also on functional heads. In the next section, these general assumptions will be applied to BP data focusing on the relation between the morphology and the semantics of number.

3.1. Number Features on Nouns

I assume that number features – singular (sg) and plural (pl) – are interpretable on nouns. I follow Krifka (1992) and Kratzer (2004) and assume that uninflected nominal denotations are cumulative and that the role of sg and pl is to restrict the denotation of a noun, eliminating sums and atoms, respectively.

$$(31) \quad \begin{aligned} [[N-]] &= \{a, b, c, a \oplus b, a \oplus c, b \oplus c, a \oplus b \oplus c\} \\ [[N\text{-sg}]] &= \{a, b, c\} \\ [[N\text{-pl}]] &= \{a \oplus b, a \oplus c, b \oplus c, a \oplus b \oplus c\} \end{aligned}$$

Thus, an uninflected bare noun has both atoms and sums in its extension, being therefore neutral with respect to number. Number-inflected nouns, on the other hand, denote sets of atoms (singular nouns) or sets of mereological sums (plural nouns). Whether or not number features host their own projection under DP/NP will not be important for our purposes in this discussion and for the sake of simplicity, I will represent them as features attached directly to nouns.

¹² Just to make the parallel with many of the examples from the previous section clearer, adding relative clauses do not change the judgements:

- (i) A mulherada que se abraçou foi embora.
the bunch-of-women that SE hugged-3sg went-3sg away
- (ii) O grupo que se abraçou foi embora.
the group that SE hugged-3sg went-3sg away

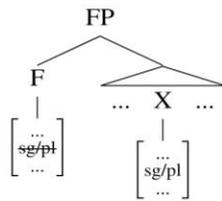
In both cases, the subject DP refers to a group whose members hugged each other. Thus, (singular) relative clause formation should not be blamed for the lack of plural readings either.

3.2. Number Features on Functional Heads

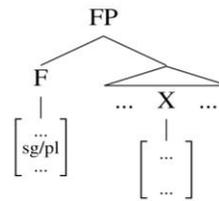
As for number features on functional heads (I, v, D, ...), I take them to be uninterpretable at the syntax-semantics interface and follow Chomsky (2000) and much subsequent work in assuming that they must be deleted (via agreement) before the syntactic representation is sent to semantic interpretation.¹³

More precisely, I assume that a number-specified functional head F requires another number-specified expression X(P) in the same structure so that they can enter into an agreement relation and F's uninterpretable features be eliminated.

(32) a. OK!



b. NOT OK!



Only in (32a) did F find an appropriate number-specified XP that can check and consequently eliminate its uninterpretable number features. In (32b), F's number feature will persist throughout the syntactic derivation and the resulting structure will not be legible by the semantic component. Notice that this is the case only under the assumption that F is specified for number. Were it not, the resulting syntactic structure would be fine and compatible with a number neutral X(P).

4. Number Specification in BP

With this general background in mind, we now turn to the number specification of functional and nominal heads in BP, paying special attention to the relation between morphology and semantics.

4.1. Verbal Functional Heads

The idea I would like to pursue for the number specification of BP verbal heads is very simple and intuitive. Verbal heads that overtly display overt

¹³ Although I am assuming the Agree-based system of more recent Chomskian Minimalism, nothing important hinges on this choice, and a Government and Binding/earlier Minimalism implementation in terms of Spec-Head relations would be compatible with the spirit of the analysis too.

number morphology are specified for number and those that do not display any overt number morphology are not specified for number, i.e., do not bear any number feature.

As the following table shows, this intuition separates finite and participial heads (of passives and reduced relatives) on one side and gerunds and little *v* (which hosts object-verb agreement) on the other.

(33) Number specification on BP verbal functional heads

Finite T	yes	compra <u>o</u> / <u>m</u>	BUY-3SG/PL
Participial	yes	comprado/ <u>dos</u>	BOUGHT-SG/PL
Gerundive	no	comprando/* <u>ndos</u>	BUYING
little <i>v</i>	no	compra ele/eles	BUY HIM/THEM

As we demonstrate later, this partition has important repercussions in our account for the interpretive asymmetries between bare singulars and bare plurals discussed in section 2. But first, we will look at the number specification on BP nouns.

4.2. Noun Phrases

My core assumption concerning number marking on BP nouns is stated in (34):

(34) BP nouns may enter a syntactic derivation without number features.

I will capitalize on the fact that there is no overt singular morpheme on BP nouns, whereas there is a plural one (-s). The following table shows the spell-out rules for singular, plural and unspecified nouns:¹⁴

(35) Number Spell-out on BP nouns

N-sg → N	menino	‘boy’
N-pl → Ns	meninos	‘boys’
N- → N	menino	‘boy’

Since there is no overt singular morpheme in BP (sg is a zero morpheme), a bare singular NP such as *menino* is ambiguous: it can be interpreted as singular or number-neutral. However, it is important to notice that although

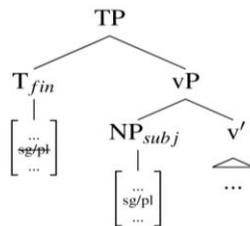
¹⁴ For simplicity, I represent the plural morpheme as -s. This is not always correct as attested by a variety of pairs, such as *mar/mares* (‘sea/seas’), *animal/animais* (‘animal/animals’), etc. This, however, does not affect the point being made here, which is the postulation of a systematic ambiguity between unspecified and singular bare nouns.

leaving a noun unspecified for number is an option in BP, whether or not this will result in a well-formed structure ultimately depends on the functional heads with which it is related, as we show in detail in the following section.

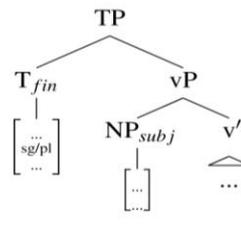
5. BP Bare Nouns and Agreement

According to what we proposed in section 4, finite T and adjectival participles are specified for number. Since the number features on these heads are uninterpretable, they require that a related argument be specified for number. In the case of bare nouns, this excludes the possibility of having a number neutral bare singular as an agreeing argument for both finite T and participial heads, as illustrated below:

(36) a. OK!



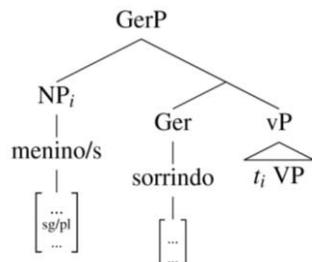
b. Not OK!



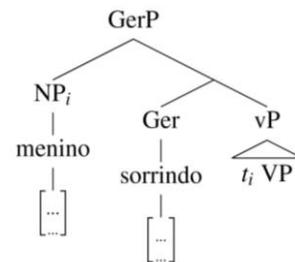
In (36a), T and the subject NP enter into an agreement relation and the uninterpretable number feature of T is deleted. In (36b), the deletion does not occur due to the fact that the subject NP is not specified for number.

Both little v and Gerunds behave differently since they are not specified for number and can be related with underspecified bare nouns.

(37) a. OK!



b. OK!



Due to the absence of uninterpretable number features, both (37a) and (37b) are well formed structures and do not require (as far as number features

are concerned) any agreement relation to take place. Notice that the number feature on the NP in (37a) is interpretable and does not need to be eliminated.

An immediate consequence of all this is that interpretations that require a non-atomic argument will not arise in the presence of a bare singular and a related finite T or a participle.

- (38) a. Eu vi alunos que estavam se cumprimentando.
 I saw students that were SE greeting
 [has a reciprocal interpretation]
- b. Eu vi aluno que estava se cumprimentando.
 I saw student that was SE greeting
 [no reciprocal interpretation]
- (39) a. Tem amigos meus exilados em muitos países.
 has friends my-pl exiled-pl in many countries
 [has a cumulative interpretation]
- b. Tem amigo meu exilado em muitos países.
 has friend my-sg exiled-sg in many countries
 [no cumulative interpretation]

Differently, interpretations that require a non-atomic argument will arise in the presence of a bare singular and a related gerund.

- (40) a. Eu vi alunos se cumprimentando.
 I saw students SE greeting
 [has a reciprocal interpretation]
- b. Eu vi aluno se cumprimentando.
 I saw student SE greeting
 [has a reciprocal interpretation]

Thus, although bare singulars can in principle be singular or number neutral, the surrounding structure may impose a number specification (singular) on them and induce a more restricted set of possible interpretations. In this sense, morphology and semantics go hand in hand as far as number specification on bare nouns is concerned.

6. Full DPs vs. Bare NPs

Hitherto, I have focused my attention on number interpretation on bare nouns. In particular, we concluded that bare singulars can have number neutral interpretations. What about full DPs? Can they also be interpreted as number neutral? This does not seem to be the case. For instance, (41a) will always denote a single boy and (41b) will always denote a plurality of boys:

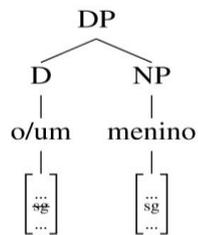
- (41) a. o menino
the-sg boy
'the boy'
b. os meninos
the-pl boys
'the boys'

The same is true of indefinite articles: singular indefinites are used to refer to atomic entities and plural indefinites to pluralities:

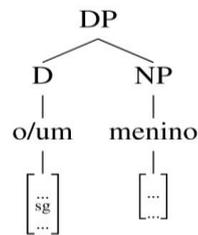
- (42) a. um menino
ind-sg boy
'a boy'
b. uns meninos
ind-pl boys
'some boys'

What then forces the number specification on nouns that are hosted under DPs? Once again, we assume that overt morphology is revealing and that both definite and indefinite articles always bear number features. Since these features are uninterpretable, the presence of an overt article forces its related NP to be specified for number.

- (43) a. OK!



- b. Not OK!



In (43a), D's uninterpretable number feature enters into an agreement relation with the number feature of the NP and gets deleted. In (43b), there is no number feature on the noun and therefore D's uninterpretable feature persists, resulting in an illegitimate structure.

As a consequence, a DP of the form $[_{DP} \text{o/um NP}]$ is always semantically singular.

- (44) a. Eu vi aluno se cumprimentando.
I saw student SE greeting
[has a reciprocal interpretation]

- b. Eu vi o/um aluno se cumprimentando.
 I saw the/a student SE greeting
 [no reciprocal interpretation]

Our account from the previous section remains intact. Only bare singulars can be number neutral. This option is not available to nouns hosted under DPs headed by definite and indefinite articles.

7. Discourse Anaphora Revisited

As we pointed out in the introduction, the main source for the intuition that BP bare singulars are number neutral is the fact that they can serve as discourse antecedents of plural anaphoric pronouns, as in (45):

- (45) Eu vi criança brincando. Elas faziam muito barulho.
 I saw child playing they made much noise
 ‘I saw children playing. They made a lot of noise.’

Throughout this paper, we argued that there are instances of bare singulars that are not number neutral, but rather singular, from both a morphological and a semantic point of view. We repeat in (46) one representative example:

- (46) Eu vi convidado que estava se cumprimentando.
 I saw guest that was SE greeting
 ‘I saw guest(s) that were greeting themselves.’

We attributed the absence of a reciprocal interpretation for cases such as (46) to a singular number feature attached to the bare singular NP. The question that arises at this point is whether or not this bare singular can serve as the discourse antecedent of a plural anaphoric pronoun. One might expect a negative answer here, since being morphologically and semantically singular, the bare noun should behave on a par with singular indefinites, which are not good antecedents for plural pronouns under these circumstances:

- (47) Eu vi uma criança brincando. Ela/*Elas faziam muito barulho.
 I saw a child playing she/they made much noise
 ‘I saw a child playing. She/*They made a lot of noise.’

However, even a bare singular that is interpreted as singular can serve as an antecedent for a plural discourse pronoun, as (48) below attests. This behavior contrasts thus with singular indefinites, as shown in (49):

- (48) Eu vi convidado que estava se cumprimentando. Eles pareciam
 I saw guest that was SE greeting They seemed
 malucos
 crazy
 ‘I saw guest(s) that were greeting themselves. They looked like
 crazy.’
- (49) Eu vi um convidado que estava se cumprimentando. Ele/*Eles
 I saw a guest that was SE greeting They
 pareciam malucos
 seemed crazy.
 ‘I saw a guest that was greeting himself. He looked like crazy.’

The situation might look paradoxical, but it is not. Let us see why. First, notice that singular indefinites and bare singulars are both interpreted as existential indefinites and make the same contribution to the truth-conditions of the sentences in which they appear. Thus, the first sentences of both (48) and (49) have the meaning roughly represented in (50):

- (50) $\exists x: \text{guest}'(x) \wedge \text{greet}'(x, x)$

In (50), x is a variable ranging over atomic individuals. The sentence says that there was one guest who was greeting himself. Notice, however, that (50) is compatible with the existence of more than one such person.

Although the static, truth-conditional contribution of the singular indefinite in (48) and the bare singular in (49) is the same, their dynamic, discourse-related contribution need not mimic this similarity. This is exactly what I want to suggest. In a nutshell, I assume that whereas a singular indefinite introduces a (atomic) discourse referent, along the lines of Kamp (1981) and Heim (1982), bare singulars do not. Their potential for serving as discourse antecedents comes from a different process, called abstraction in Kamp and Reyle (1993)¹⁵.

Roughly speaking, abstraction is a process of set formation corresponding to the intersection of what is usually called the restrictor and the nuclear scope of certain determiners. In the case of (48), we have the intersection between the set of guests and the set of individuals who were greeting themselves. It is this set that provides the referent for the plural pronoun in the subsequent discourse. A similar case can be made for determiners such as *mais de um* (‘more than one’), as in the example below:¹⁶

¹⁵ See also Szabolcsi (1997) for pertinent discussion.

¹⁶ See Kamp and Reyle (1993) for interesting evidence for assuming that certain cardinal determiners do not directly introduce discourse referents.

- (51) Mais de um aluno acertou a questão. Eles ganharam um
 more than one student answered the question. They won a
 ponto extra
 point extra
 ‘More than one student answered the question. They got an extra point.’

In (51), it is assumed that the non-referring expression *mais de um aluno* (‘more than one student’) combines with the predicate VP, resulting in truth-conditions stating that the intersection between the set of students and the set of individuals who answered the question has cardinality greater than one. It is to this set that the pronoun *eles* (‘they’) refers. What I am proposing is that the same process applies to bare singulars in BP (assuming the presence of a covert existential determiner for bare NPs). Thus, we need no new machinery to explain the dynamic differences between singular indefinites and bare singulars.

We are also in a position to address a difference pointed out in the introduction between gender and number mismatch. The relevant example is repeated below:

- (52) Tem criança na sala. Ela/*Ele está chorando.
 has child in-the room she/he is crying
 ‘There is a child in the room. She/he is crying.’

Recall that the noun *criança* is morphologically feminine, but semantically neuter and can refer to both boys and girls. However, it cannot serve as the antecedent of a masculine anaphoric pronoun. Contrastingly, the morphologically singular NP *criança* can serve as the antecedent of a plural anaphoric pronoun, as we have just emphasized. Here, we may credit the asymmetry between gender and number to the non-existence of anything akin to abstraction in the domain of gender.

Summing up, even when bare singulars are morphologically specified for number and has the same contribution to the static meaning of a sentence as singular indefinites do, their dynamic, discourse potential is different, and through a process of set formation they can still (although indirectly) serve as antecedents to plural discourse anaphora.

8. Conclusion

In this paper, I provided evidence against the idea that BP bare singulars are morphologically singular but semantically number neuter. I have argued instead that they are sometimes specified for number (singular) and sometimes underspecified and that this has semantic consequences. I developed an account according to which whether or not a bare noun can enter a syntactic derivation under-specified for number depends on the functional heads to which it is syntactically related. The main conclusion is

that, as far as number features in BP noun phrases are concerned, morpho-syntactic specification should NOT be kept apart from semantic interpretation.

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