Rebel Without a Case: Quantifier Floating in Brazilian Portuguese and Spanish[1]

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Abstract: This paper investigates the relation between quantifier floating and abstract Case. I propose that the ability of QP-type quantifiers to float in Romance languages relies on their ability to only optionally be assigned Case in the syntax, which is not the case for argumental DPs and smaller categories in the nominal domain. I also propose that the focalization of a nominal element XP in Brazilian Portuguese (BP) is done via a null head F^0 projecting above XP. The combination of focalization (encoded as proposed) and the internal structures of QPs is shown to derive the asymmetries between *todos* 'all' and *cada um* 'each one' in BP, as well as cross-linguistic differences with Spanish, when the sentential cartographies of the two languages are contrasted. The main argument of the paper, namely that QPs are special with respect to abstract Case, is built through the comparison of BP and Spanish in the licensing of post-verbal subjects.

Key-words: quantifier floating; abstract Case; focalization; Brazilian Portuguese; Spanish.

1. Introduction

Among the functional pre-nominal elements of Romance languages, only some quantifiers have the ability to float. This well-known situation is illustrated here with data from Brazilian Portuguese (BP). Among the different nominal elements in (1) that can appear as subjects, only the quantifier in (2)a can float, whereas the determiner in (2)b, the possessive in (2)c, and the cardinal and the numeral quantifier in (2)d cannot. This paper addresses the question of why this contrast exists in Romance.[2]

[1] This paper is a development of a suggestion I made in my MA thesis (Lacerda 2012) at the Universidade de São Paulo, Brazil, supervised by Jairo Nunes, to whom I am thankful. I also thank Jonathan Bobaljik, Željko Bošković, Marcelo Ferreira, Mary Kato, Esmeralda Negrão, Francisco Ordóñez, Susi Wurmbrand, and two anonymous OUP reviewers for valuable comments, and Emma Nguyen for proofreading. All errors are of my own responsibility.

[2] Note that other nominal modifiers can be separated from their associated noun in other languages, such as numerals in Japanese (see e.g. Miyagawa 1989) and demonstratives in Warlpiri (see e.g. Baker 2001).

(1) a. **Todos os alunos** leram essa revista. ✓ *quantifier subject*
all the students read this magazine

b. **Aqueles alunos** leram essa revista ✓ *determiner subject*
those students read this magazine

c. **Meus alunos** leram essa revista. ✓ *possessive subject*
my students read this magazine

d. **Vinte/poucos alunos** leram essa revista. ✓ *numeral subject*
twenty/few students read this magazine

(2) a. Os alunos$_i$ leram **todos** t_i essa revista. ✓ *floating quantifier*
the students read all this magazine

b. *Alunos$_i$ leram **aqueles** t_i essa revista × *floating determiner*
students read those this magazine

c. *Alunos$_i$ leram **meus** t_i essa revista. × *floating possessive*
students read my this magazine

d. *Alunos$_i$ leram **vinte/poucos** t_i essa revista. × *floating numeral*
students read twenty/few this magazine

By comparing (2)a and (2)b-d, one could hypothesize that the contrast lies in the category of the element in subject position. It is true that even quantifiers that can float elsewhere cannot do so when selecting an NP, as shown in (3). However, this cannot be the source of the contrast in (2). Even though cardinals and numeral quantifiers can also select for a (partitive) DP, just like the floating quantifier *cada (um)* 'each (one)', they cannot float, as seen in (4).

(3) a. Todo aluno leu duas revistas. ✓ *Q-NP*
all student read two magazines

b. *Aluno$_i$ leu **todo** t_i duas revistas. × *NP ... Q*
student read all two magazines
'Every student read two magazines.'

c. **Cada** aluno leu duas revistas. ✓ *Q-NP*
each student read two magazines

d. *Aluno$_i$ leu **cada** t_i duas revistas. × *NP ... Q*
student read each two magazines
'Each student read two magazines.'

(4) a. **Cada um dos alunos** leu duas revistas. ✓ *quantifier + partitive DP*
each one of-the students read two magazines
b. Os alunos$_i$ leram **cada um** t_i duas revistas. ✓*floating quantifier*
the students read each one two magazines
'Each one of the students read two magazines.'
c. **Vinte/poucos dos alunos** leram essa revista. ✓ *numeral + partitive DP*
twenty/few of-the students read this magazine
d. *Os alunos$_i$ leram **vinte/poucos** t_i essa revista. × *floating numeral*
the students read twenty/few this magazine
'Twenty/few of the students read this magazine.'

That the problem does not rely on the category of the subject is corroborated by (5). Note that the possessive phrase *meus alunos* 'my students' cannot leave a floating determiner behind, despite the fact that a possessive phrase is possible in subject position, as seen above in (1)c. The question is then why some of the above elements can float while others cannot.

(5) a. **Aqueles meus alunos** leram essa revista. ✓ *determiner subject*
those my students read this magazine
b. *Meus alunos$_i$ leram **aqueles** t_i essa revista × floating *determiner*
my students read those this magazine
'Those students of mine read this magazine.'

As for quantifiers in Romance languages, the question of why they float has recently been addressed in the literature by Valmala (2008). He proposes that both the quantifier Q and its nominal associate AS can independently undergo movement in Spanish, the reason for the split between Q and AS being an *informational mismatch* between them, i.e. when they have different specifications

among the informational values of topic, focus, and neutral. The possibilities that lead to floating are given in (6); sentence (7) illustrates the scenario in (6)a.[3]

(6) a. Q_{FOC} + AS_{TOP}
b. Q_{FOC} + AS_{NEUT}
c. Q_{NEUT} + AS_{FOC}
d. Q_{NEUT} + AS_{TOP} (adapted from Valmala 2008:845, ex. (30))

(7) [Los estudiantes de física]$_{TOP}$ han conseguido **todos**$_{FOC}$ t_{foc} t_{top} beca. (*Spanish*)
the students of physics have got all grant
['All the students of physics have gotten a grant.']
(Valmala 2008:846, ex. (31c))

I assume with Valmala that Q and AS may both move for independent reasons and I acknowledge that informational factors play a role in quantifier floating. Nevertheless, I argue that an informational mismatch cannot be the reason why floating happens. It is neither a necessary condition (as neutral floating is possible, at least in BP, i.e. floating of Q_{NEUT} + AS_{NEUT} also exists), nor a sufficient one (as it does not prevent other pre-nominal elements of (1)-(2) from floating and does not account for why different floating quantifiers in a given language may float in different ways).

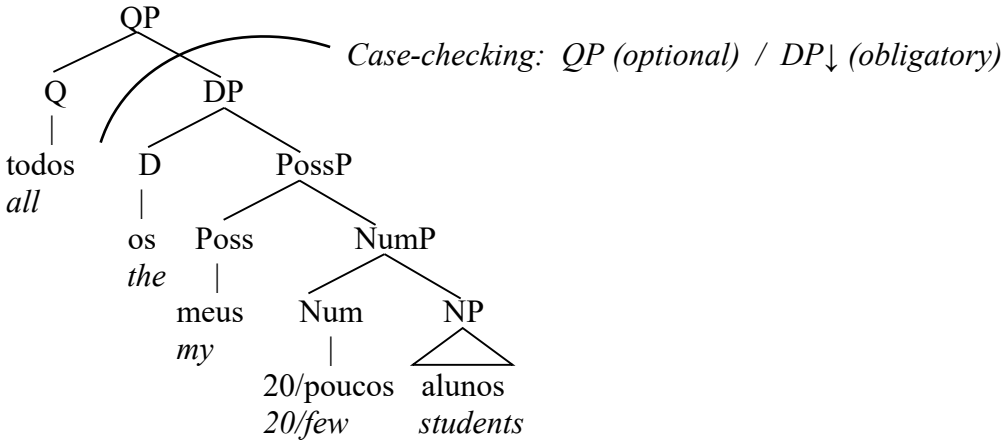
My proposal is that quantifier floating in Romance languages is possible because *QP-type quantifiers do not have to check Case in the narrow syntax* (although they can do so). In general terms, QPs may have different (less strict) syntactic licensing conditions than smaller categories (i.e. DP and categories below DP).[4] This idea traces back to Sportiche's (1988) seminal work. In a brief passage, the author asks: "Why is a constituent of the form [*tous* e] ['all' e; RL] permitted in a Caseless position? The answer is straightforward: if *e* is an NP-trace (or PRO), no Case is needed […]" (p.436).[5] Although I may not consider the answer to this question to be as "straightforward," I will, indeed, highlight the importance of Sportiche's original insight for a theory of floating quantifiers (at least in Romance languages).

[3] Valmala assumes with Rizzi (1997) that quantifiers cannot be topics.
[4] I am of course excluding the contexts of default case, as discussed e.g. by Schütze (2001).
[5] Similarly, Belletti (2004:36) suggests that Italian *tutto* 'everything' does not move to the object Case position, "as its quantifier status does not impose Case requirements on it."

The example in (8) shows that the functional pre-nominal elements of (1)-(2) can all co-occur with a single NP. Given the fact that they must obey the order Q-D-Poss-Num-NP, I assume the structure in (9), which indicates where the cut-off for obligatory Case-checking is, under the analysis presented here.[6] It is important to note that I am not arguing that *every* layer of a given NP must check Case. Checking of Case by the highest layer is sufficient to license the whole nominal expression (with respect to Case), as standardly assumed. For instance, in (5)a above, only the determiner *aqueles* 'those' checks nominative, which arguably spreads down to PossP and NP via Concord (details of which I leave open here).

(8) Todos os meus vinte/poucos alunos já ganharam uma bolsa.
all the my twenty/few students already received a grant
'All the twenty/few students of mine have already received a grant.'

(9)



The evidence for this proposal comes from Brazilian Portuguese and comes to light when this language is compared to other Romance languages (in this paper, I concentrate on the differences between BP and Spanish). The paper is organized as follows. In section 2, in order to account for differences between the floatability of *todos* 'all' and *cada um* 'each one', I propose that focalization in BP is encoded in the nominal domain by a null head projecting above the focalized element. In section 3, by contrasting BP and Spanish, I show that QPs can generally be licensed in (Caseless) positions where DPs (and smaller categories) cannot, namely the (post-verbal) low left periphery (Belletti 2004) and the thematic verbal domain. Section 4 concludes the paper.

[6] Possessives may also be post-nominal, which is irrelevant here.
(i) Aqueles alunos meus
those students my
'Those students of mine'

2. The role of focalization

In this section, I show that focalization plays a role in quantifier floating by affecting the possibility of extraction out of the quantifier phrase. The section is complemented by an idiosyncrasy of BP with respect to other Romance languages: a colloquial version of the quantifier *todos* 'all' that is inherently focalized, namely *tudo* lit.'everything'.

2.1. Extracting out of QP: the focalizer FP layer

Even though both *todos* 'all' and *cada um* 'each one' can float in BP, they do not necessarily float the same way. Recall from the Introduction (cf. (2)a/(4)b) that *todos* and *cada um* can equally float in the post-verbal position, as shown in (10). However, only *cada um* can float in the position to the right of the direct object, as shown in (11). I will argue below that this contrast arises from the combination of two factors: (i) that the QP of *todos* and the QP of *cada um* have different internal structures and (ii) that the quantifiers in (10) are focalized (see section 3.1) while the quantifiers in (11) are informationally neutral (see section 3.2).

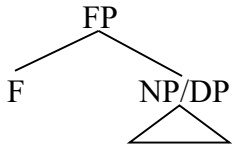
(10) a. Os alunos$_i$ leram **cada um** t_i duas revistas.
the students read each one two magazines
'Each one of the students read two magazines.'

b. Os alunos$_i$ leram **todos** t_i duas revistas.
the students read all two magazines
'All the students read two magazines.'

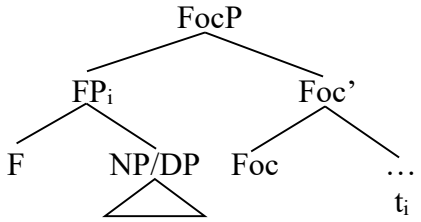
(11) a. Os alunos$_i$ leram duas revistas **cada um** t_i .
the students read two magazines each one
'Each one of the students read two magazines.'

b. *Os alunos$_i$ leram duas revistas **todos** t_i .
the students read two magazines all
'All the students read two magazines.'

In order to connect factors (i) and (ii) above in accounting for the contrast seen in (10)-(11), I propose that the focalization of a nominal element in BP is facilitated via a null head F^0, which projects above focalized elements. More precisely, the focus feature of an NP/DP is encoded in the nominal domain by an additional layer (FP), as in (12)a, which shows the structure of a focalized NP/DP.[7] The FP projection (i.e. the focalized NP/DP) must then be checked against a Foc^0 head, along the lines of Rizzi (1997), as in (12)b, where FP moves to Spec,FocP.

(12) a. 

= focalized NP/DP

b. 

= focalized NP/DP licensed in Spec,FocP

The contrast in (10)-(11) can be summarized in the following way: whereas *cada um* can float with either focus or neutral informational value, *todos* cannot float when it is informationally neutral, i.e. it requires focalization to float. Under the above proposal that focalization is encoded by FP, this additional structural layer is then crucial for the floating of *todos*, but not for the floating of *cada um*. I now turn to why this is so.

I adopt here Bošković's (2014) contextual approach to phasehood, in which "the highest projection in the extended projection of a major (i.e. lexical) category functions as a phase" (p.28).[8] The following paradigm from Serbo-Croatian, a language without a DP layer in the nominal domain, illustrates the functioning of this approach. In (13) below, the NP *this student* (*this* being left-adjoined to *student*, since Serbo-Croatian lacks DP) is the complement of *pictures* and can only be extracted in the presence of a quantifier, which adds another layer to the structure.

[7] Bastos-Gee (2011) shows evidence for the existence of topic and focus projections in the nominal domain of BP to which topicalized and focalized elements can move, which I do not dispute. However, I differ from her with respect to the structure of the focalized element itself, since for her an informational feature (such as focus) does not force the presence of a corresponding projection (such as FP) in the NP/DP.
[8] For other contextual approaches to phasehood, see e.g. Bobaljik & Wurmbrand (2005) and Wurmbrand (2013).

(13) a. Ovog studenta$_i$ sam pronašla mnogo/deset slika t_i . (*Serbo-Croatian*)
this$_{GEN}$ student$_{GEN}$ am found many/ten pictures$_{GEN}$
'Of this student I found many/ten pictures.'

b. ?*Ovog studenta$_i$ sam pronašla sliku t_i .
this$_{GEN}$ student$_{GEN}$ am found picture$_{ACC}$
'Of this student I found a picture.' (Bošković 2014:36, ex.(17))

The situation is explained below (with English words). First note that the nominal expression in (14) is a QP, whereas in (15) it is an NP. Under Bošković's approach, QP (not NP_1) is a phase in (14); in (15), conversely, NP_1 is a phase, as it is the highest layer. Therefore, in (14), in order to be extracted, the NP *this student* must move to the edge of the QP-phase, in compliance with the Phase Impenetrability Condition (PIC) (Chomsky 2001). This movement also respects anti-locality (i.e. the ban on movement that is too short; see Bošković 1994, Abels 2003, and Grohmann 2003), as the NP_2 crosses one maximal projection, namely NP_1.[9] In (15), on the other hand, the NP_2 is trapped inside the NP_1. In order to comply with the PIC, the NP_2 must move to the edge of NP_1 (complement-to-Spec), as in (15)b, which violates anti-locality. If the NP_2 moves directly out of the NP_1, as in (15)c, it violates the PIC. From examples like these, Bošković (2014) concludes that the addition of layers in a given domain affects the extractability out of it: an XP can only be extracted if it can move to the edge of the phase that contains it by crossing at least one maximal projection.

(14) a. [$_{QP}$ many [$_{NP1}$ pictures [$_{NP2}$ this student]]]
b. [$_{QP}$ [$_{NP2}$ this student]$_i$ [$_{Q'}$ many [$_{NP1}$ pictures t_i]]]
c. [$_{NP2}$ this student]$_i$ … [$_{QP}$ t_i [$_{Q'}$ many [$_{NP1}$ pictures t_i]]]

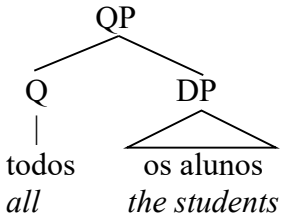
(15) a. [$_{NP1}$ picture [$_{NP2}$ this student]]
b. *[$_{NP1}$ [$_{NP2}$ this student]$_i$ [$_{N'}$ pictures t_i]] × *Anti-locality*
c. *[$_{NP2}$ this student]$_i$ … [$_{NP}$ pictures t_i] × *PIC*

Let us now observe the internal structure of the quantifiers *todos* 'all' and *cada um* 'each one' and see how focalization, encoded as an FP in the nominal structure, affects their floatability. I assume

[9] In Bošković's (1994) approach to anti-locality, which I assume here, a moving element must cross at least one phrase.

with Vicente (2006) that *todos* takes a DP as its complement (as was first proposed by Shlonsky (1991) for Hebrew *kol* 'all') and I adopt her structure in (16). *Cada* 'each' takes an NP as its complement and cannot be separated from it, as shown in (17). Nevertheless, when this NP is the pro-form *um* 'one', it may select for a (partitive) DP, in which case floating is possible, as in (18). The structure adopted is that in (19). [10]

(16)



(Vicente 2006:99, ex. (42))

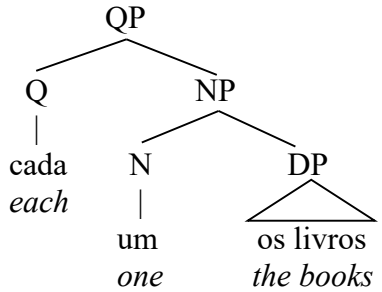
(17) a. **Cada livro** tem um autor diferente.
each book has a author different

b. *Livro$_i$ tem **cada** t_i um autor diferente.
book has each a author different
'Each book has a different author.'

(18) a. **Cada um dos livros** tem um autor diferente.
each one of-the books has a author different

b. Os livros$_i$ têm **cada um** t_i um autor diferente.
the books have each one a author different
'Each one of the books has a different author.'

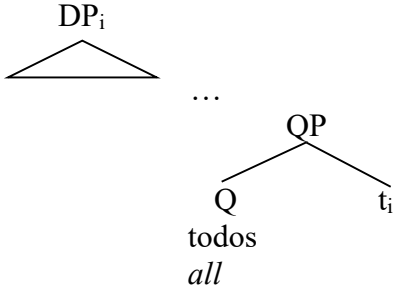
(19)



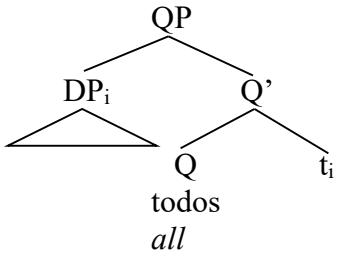
[10] For simplicity, I assume the preposition *de* 'of' to be dummy. The idea that the partitive *of*-phrase is selected by the pro-form *um* 'one' is taken from Safir & Stowell (1988).

When the quantifier *todos* has neutral informational value, there is no FP layer above the QP, which prevents its complement DP from being extracted. The extraction of the DP complement of *todos* cannot happen as in (20)a, for it violates the PIC (the DP being only visible in the edge of the phase, Spec,QP). If, on the other hand, the DP moves to the edge of QP, it does note cross any maximal projection, which violates anti-locality, as in (20)b.

(20) a. * ✗ *Neutral* todos*: PIC*

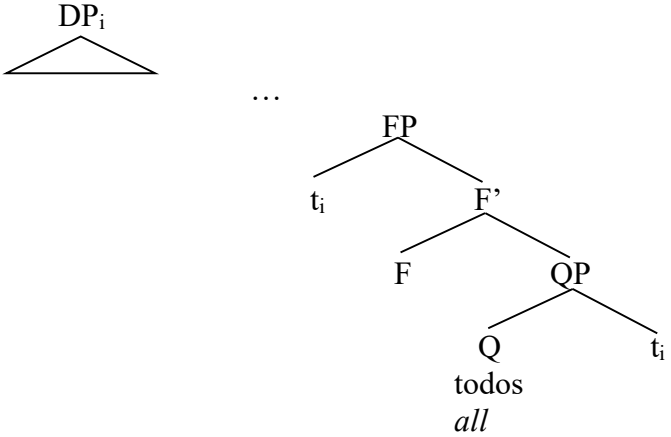


b. * ✗ *Neutral* todos: *Anti-locality*



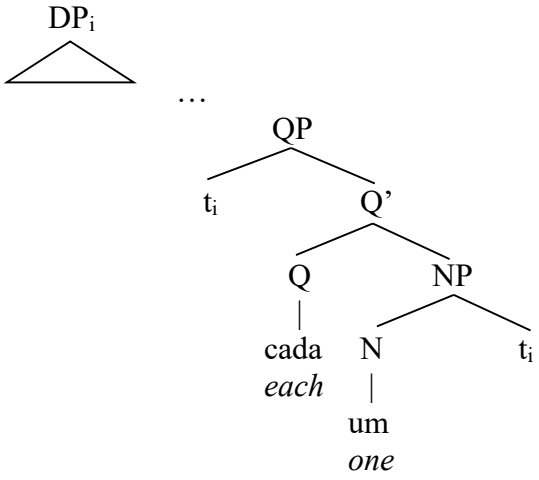
However, if the focus interpretation of the quantifier entails the presence of an additional FP layer, as proposed here, the DP can be extracted, as in (21). Given that FP is the highest projection in the nominal domain, FP (not QP) counts as a phase. The DP can thus move to the edge of FP without violating anti-locality.

(21) ✓ *Focalized* todos

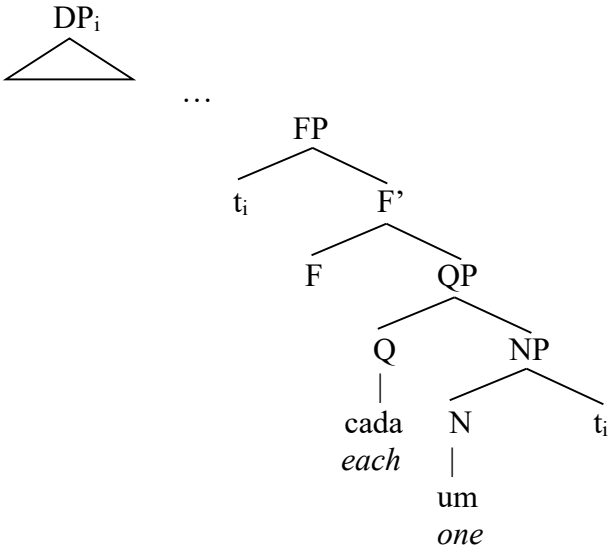


The quantifier *cada um* 'each one', on the other hand, has enough structure on its own to allow the extraction of the DP. Recall from (19) that the associate DP is not selected by the QP, but by the pro-form *um* 'one'. There being an NP projection between the DP and the QP, the DP can be extracted out of the QP in compliance with the PIC and anti-locality. If the quantifier has neutral interpretation, the DP is extracted via Spec,QP, as in (22)a; if the quantifier is focalized, the DP is extracted via Spec,FP, as in (22)b.

(22) a. ✓ *Neutral* cada um



b. ✓ *Focalized* cada um



That the floating of *todos* is contingent on focalization, unlike *cada um*, is corroborated by the contrast in (23). As pointed out by Rizzi (1997), the focus nature of a *wh*-element prevents another element from being focalized in the sentence. This gives rise to a sharp contrast: *todos* cannot float in

a *wh*-question, but *cada um* can. Additionally, an instance of double-floating can be constructed where *todos* is focalized (in the low left periphery) and *cada um* is neutral, but not the opposite, as (24) shows.

(23) a. *Quantas revistas$_w$ os alunos$_i$ leram **todos** t_i t_w ?
how.many magazines the students read all
'How many magazines did all the students read?'

b. Quantas revistas$_w$ os alunos$_i$ leram **cada um** t_i t_w ?
how.many magazines the students read each one
'How many magazines did each one of the students read?'

(24) a. Os alunos leram **todos** duas revistas **cada um**.
the students read all two magazines each one

b. *Os alunos leram **cada um** duas revistas **todos**.
the students read each one two magazines all
'All the students read two magazines each.'

As seen above, the necessity of focus for floating is contingent on the internal configuration of each quantifier. Because of its simple QP structure, *todos* requires focalization to float (as the FP layer provides the DP with an escape hatch on its way out of the QP). However, when we look at another quantifier with a more complex internal structure, we see that floating may happen even when there is no informational mismatch between QP and DP: the structure of *cada um* is rich enough to allow the extraction of the DP without FP. Floating possibilities are thus determined by the epiphenomenal interplay of informational and syntactic factors.

2.2. Tudo *'everything' as a floating quantifier*

The quantifier *todos* 'all' in BP has a colloquial counterpart, *tudo* lit.'everything', that is not found as a floating quantifier in other Romance languages (including European Portuguese). *Tudo* floats in the same way as *todos*, i.e. it cannot float in a neutral position, as (25) shows. It also allows the order

DP-Q, an internal switch that encodes topicalization or resumptivity of the DP (Vicente 2006), as can be seen in (26).[11] That *DP-Q* forms a constituent is shown by the cleft test in (27).

(25) a. Os alunos$_i$ já compraram **tudo** t_i o livro. ✓ *focus floating*
the students already bought everything the book
b. *Os alunos$_i$ já compraram o livro **tudo** t_i . × *neutral floating*
the students already bought the book everything
'All the students have already bought the book.'

(26) a. [Os alunos **tudo**/**todos**] compraram o livro. ✓ *subject DP-Q*
the students everything/all bought the book
'All the students bought the book.'
b. O professor aprovou [os alunos **tudo**/**todos**]. ✓ *object DP-Q*
the teacher approved the students everything/all
'The teacher passed all the students.'

(27) A: Who suggested the group activity?
B: Foram [os alunos **tudo**/**todos**] (que sugeriram a atividade em grupo).
were the students all/everything (that suggested the activity in group)
'It was all the students (who suggested the group activity).'

However, in contrast to *todos*, *tudo* (meaning 'all') cannot appear in subject position, as is shown in (28).[12,13] It also cannot appear without a complement DP, as in (29). In object position, *tudo* is also different from *todos* in the sense that it must obligatorily bear the main stress of the nominal phrase (cf. the ungrammaticality of (30)a, with stress represented with capital letters), which can be achieved through an internal switch (see (30)b) or through post-verbal focalization, as in (30)c and (31)a. If

[11] Vicente (2006) analyzes this switch as a complement-to-Spec movement. Given my assumption of anti-locality, Vicente's analysis cannot be maintained. I thus suggest that the examples in (26) should be analyzed as instances of topicalization in the nominal domain, as in Bastos-Gee (2011), where topic and focus projections à la Rizzi (1997) can appear within the DP and host topicalized and focalized subparts of such DP (see footnote 7).
[12] This fact has already been pointed out e.g. by Vicente (2006) and Cançado (2006). While I share their judgment, there are some speakers who accept the sentence. I leave this variation aside for the moment.
[13] Following a suggestion by Jairo Nunes (p.c.), I hypothesized in Lacerda (2012) that this restriction could be due to *tudo*'s lack of phi-features and hence incapability of agreeing with T^0.

another element is focalized, *tudo* cannot occur (see (31)b). Its stress requirement and its incompatibility with another focalized element suggest that *tudo* is inherently marked for focus, hence its incapability to float in a neutral position.[14]

(28) a. **Todos os alunos** fizeram a prova. ✓ *subject* todos-*DP*
all the students did the exam
b. ***Tudo os alunos** fizeram a prova. × *subject* tudo-*DP*
everything the students did the exam
'All the students took the exam.'

(29) a. O professor aprovou **todos**. ✓ *stand-alone* todos
the teacher approved all
b. *O professor aprovou **tudo**. × *stand-alone* tudo
the teacher approved everything (okay if *tudo* means 'everything')
'The teacher passed everybody.'

(30) a. *Eu comprei [tudo os LIvros]. × tudo-***DP**
I bought everything the books
b. Eu comprei [os livros TUdo]. ✓ *DP*-**TU**do
I bought the books everything
c. Eu comprei [TUdo os livros]. ✓ **TU**do-*DP*
I bought everything the books
'I bought all the books.'

(31) a. Eu dei [TUdo os livros] (ontem) pra Maria. ✓ **TU**do-*DP*
I gave everything the books (yesterday) to-the Mary
b. *Eu dei PRA MARIA (ontem) TUdo/tudo os livros. × *Focus* + tudo
I gave to-the Mary (yesterday) everything the books
'I gave all the books to Mary (yesterday).'

[14] That *tudo* is inherently marked for focus can arguably also account for why it cannot appear without a complement DP (cf. (29)b). Being focalized, it requires an element (namely, an overt DP) to be given/presupposed information.

Although it is clear that informational factors do play a role in quantifier floating, as first proposed by Valmala (2008) (and evidenced by the existence of a quantifier that is inherently marked for focus in BP), they do not prevent other informational mismatches (which may happen freely) from overgenerating floating constructions (cf. (2)b-d). In the next section, data from BP will be contrasted with Spanish to provide support for the existence of the cut-off for obligatory Case-checking proposed in (9). The differences between these two languages with respect to the licensing of post-verbal subjects are of special importance to the discussion that follows.

3. QPs without Case

In this section, I show that QP-type quantifiers in BP can be licensed without abstract Case in positions where other nominal categories cannot be licensed unless they are Case-marked. First I discuss the low left periphery (Belletti 2004), where both *todos* 'all' and *cada um* 'each one' can be focalized, and then I discuss the (verbal) thematic domain, where *cada um* can float with neutral informational value.

3.1. The low left periphery

In the following discussion, I assume Belletti's (2004) proposal that the post-TP area may have topic and focus projections just like the left periphery of the sentence (Rizzi 1997). The cartography of the middle field of the sentence adopted here is roughly the one in (32).

(32) [CP [TP [TopP [FocP [vP [VP]]]]]]

As is known (see e.g. Ordóñez 1997 and Zubizarreta 1998), Spanish allows both pre-verbal and post-verbal transitive subjects, as shown in (33). BP, on the other hand, does not have post-verbal transitive subjects (see a.o. do Nascimento 1984, Duarte 1993, and Kato 2000). The paradigm in (34) illustrates that the canonical order in BP is SVO, whereas VSO is disallowed and VOS is only possible with a (high) right-dislocated subject.

(33) a. Juan compró una computadora. ✓ *SVO* (*Spanish*)
John bought a computer
b. Compró Juan una computadora. ✓ *VSO*
bought John a computer
c. Compró una computadora Juan. ✓ *VOS*
bought a computer John
'John bought a computer.'

(34) a. O João comprou um computador. ✓ *SVO* *(BP)*
the John bought a computer
b. *Comprou o João um computador. × *VSO*
bought the John a computer
c. Comprou um computador, o João. ✓*VOS (right-dislocated S)*
bought a computer the John
'John bought a computer.'

I take this paradigm to indicate that nominative cannot be licensed rightwards in BP (i.e. without movement to Spec,TP). Nevertheless, subject-related QP-type quantifiers can float in the low left periphery (in Spec,FocP), despite the lack of Case, as we saw in the examples (2)a and (4)b above, repeated below in (35).[15] Thus it cannot be the case that the QPs are licensed with nominative prior to the movement of the DP to the pre-verbal position; nominative is instead assigned to the DP itself.

(35) a. [$_{TP}$ Os alunos$_i$ leram [$_{FocP}$ **todos** t$_i$ [$_{vP}$ essa revista]]]. = (2)a
the students read all this magazine
'All the students read this magazine.'
b. [$_{TP}$ Os alunos$_i$ leram [$_{FocP}$ **cada um** t$_i$ [$_{vP}$ duas revistas]]]. = (4)b
the students read each one two magazines
'Each one of the students read two magazines.'

[15] Subject and verb are standardly assumed to move to the TP area in BP; see e.g. Tescari Neto (2013) and references therein. The author argues, however, that Q-float is not a reliable diagnostics for V-raising in BP. This conclusion is based on his adverbial analysis of Q-float, though, which is substantially different from the account offered here.

By looking at constructions like (36)B, one could hypothesize that QPs can exceptionally receive rightward nominative (in which case (35) could be derived in the manner rejected in the preceding paragraph). However, when we (again) look at a different floating quantifier, the situation can be clarified. In (37)B, we see that the verb does not agree with *cada um*, contrary to Spanish, where the verb can do so (see (38)). Although Case and agreement may be two separate phenomena, they usually go together in Romance languages, so the lack of agreement in (37)B may be taken as an indication that nominative is not assigned to the quantifier.[16]

(36) A: E os filhos do João? (*BP*)
and the sons of-the John
'What about John's sons?'
B: Estão **todos** estudando na USP.
are all studying in-the USP
'They are all studying at USP.'

(37) A: E os filhos do João? (*BP*)
and the sons of-the John
'What about John's sons?'
B: Leram$_{3.PL}$ **cada um**$_{3.SG}$ três livros.
read each one three books
'They read each three books.'

(38) Leyó$_{3.SG}$ **cada uno**$_{3.SG}$ trés libros. (*Spanish*)
read each one three books
'Each read three books.'

A stronger argument for the claim that the QP does not enter into a Case relation with the T^0 head in (36)B and (37)B arises when we identify what the verb is agreeing with, namely the DP under discussion *os filhos do João* 'John's sons'. I propose that these constructions are thus derived by quantifier floating followed by subject topic-drop, as represented in (39). This analysis is supported by the fact

[16] A singular form of the verb is actually possible in non-standard varieties of BP, which is orthogonal here.

that a moved *wh*-element blocks the application of topic-drop.[17] In (40), topic-drop would be the only way to derive the null subject, as BP does not have *pro* as referential subjects (see a.o. Duarte 1995 and Ferreira 2000). Since the structure in (41) is not available, (40) results in an EPP violation (assuming that at some point of the derivation Spec,TP must be filled in BP). The impossibility of (40) thus shows that *todos* and *cada um* in (36)B and (37)B are floating quantifiers rather than post-verbal subjects. That in Spanish the quantifier may be a subject is corroborated by the fact that (42) is compatible with *wh*-movement.

(39) ~~os filhos do João~~$_{\mathbf{TOP}}$ ~~os filhos do João~~$_{\mathbf{SUBJ}}$ Leram **cada um** t_{SUBJ} três livros
the sons of-the John the sons of-the John read each one three books

(40) (E os filhos do João,) *quantos livros __ leram **cada um**?
(and the sons of-the John) how.many books read each one
'(What about John's sons,) how many books did they read each?'

(41) *~~os filhos do João~~$_{TOP}$ quantos livros$_{WH}$ ~~os filhos do João~~$_{SUBJ}$ leram **cada um**
the sons of-the John how.many books the sons of-the John read each one

(42) Cuántos libros leyó$_{3.SG}$ cada uno$_{3.SG}$? (*Spanish*)
how.many books read each one
'How many books did they read each?'

In order to completely rule out the possibility that floating quantifiers in BP do check Case (and are thus some sort of post-verbal subjects), we need to look at constructions where post-verbal subjects are possible and see whether we can find any interesting contrasts between QPs and nominals of other categories. Given that internal arguments (of passives and unaccusatives, for example) can be post-verbal subjects freely in BP, I will focus on external arguments. One interesting domain to look at where external arguments can be post-verbal subjects in BP is locative inversion with unergative predicates. As shown by Avelar & Cyrino (2008), an unergative agent can be post-verbal as long as a locative fills the subject position (triggering third person default agreement), as in (43). Since the PP

[17] See e.g. Ross (1982) and Sigurðsson & Maling (2010).

is analyzed as getting nominative Case, Avelar (2009) assumes that the external argument is licensed with partitive Case (in the sense of Belletti 1988).[18]

(43) a. Naquele quarto dormiu várias pessoas.
[in-that bedroom slept$_{3.SG}$ several people]
['Several people slept in that bedroom.']
b. Naquela fábrica trabalha muitos amigos meus.
[in-that factory works$_{3.SG}$ many friends my]
['Many friends of mine work in that factory.']

(Avelar & Cyrino 2008:61, ex.(12)a-b)

If the agent is licensed with partitive Case in the examples above, we could hypothesize that partitive is assigned by a special $v^0_{(PART)}$ head (arguably in a V^0+v^0 complex; see Lasnik 1995). If $v^0_{(PART)}$ enters the numeration, no accusative Case can be assigned, for accusative is assigned by a different head, $v^0_{(ACC)}$. The ungrammaticality of (44) can then also be accounted for: Once the PP *nessa fábrica* 'in this factory' gets nominative, the agent and the direct object will compete for the single Case that v^0 can assign (either partitive or accusative).

(44) *Nessa fábrica comprou várias pessoas um computador.
in-this factory bought several people a computer
'Several people bought a computer in this factory.'

[18] That this may be correct is corroborated by the fact that post-verbal subjects exhibit definiteness effects in locative inversion. As shown in (i)B', a definite subject is not felicitous in a neutral context. According to Belletti (1988:15), a "list reading results when a definite NP is marked with partitive Case", which is the case in (ii), where *o João (e o Pedro)* is an appropriate subject.

(i) A: What is the problem? / What gives?
B: Nessa sala trabalha/estuda muita gente.
in-this room works/studies many people
'Too many people work/study in this room.'
B': #Nessa sala trabalha/estuda o João.
in-this room works/studies the John
'John works/studies in this room.'

(ii) A: Who works/studies in this room?
B: Nessa sala trabalha/estuda o João (e o Pedro).
in-this room works/studies the John (and the Peter)
'John (and Peter) works/studies in this room.'

The prediction that this analysis of (44) leaves us with is that when the accusative-assigning $v^0_{(ACC)}$ is selected, an agent that does not need Case will not cause the derivation to crash. This prediction is borne out. QP-type quantifiers can be the agents in this kind of construction, as shown by (45) and (46).[19]

(45) a. Nessa fábrica$_{NOM}$ comprou cada um$_{[\ ]}$ um computador$_{ACC}$.
in-this factory bought each one a computer
'Each one bought a computer in this factory.'

b. Aqui$_{NOM}$ compra cada um$_{[\ ]}$ a sua comida$_{ACC}$.
here buys each one the his food
'Each one buys their (own) food here.'

(46) Nessa escola$_{NOM}$ usa todos$_{[\ ]}$ a mesma roupa$_{ACC}$.
in-this school wears all the same outfit
'Everybody wears the same outfit in this school.'

Also relevant here is the fact that elements that do need Case cannot be licensed with default case in the (post-verbal) low left periphery, as shown in (47) (see also (34)b above). In (47)a, the preposition is obligatory on the topic moved to the low left periphery, whereas in (47)b the dropping of the preposition is possible, as default case is available in the high left periphery (assuming that base-generation is possible in the latter but not in the former).[20]

(47) a. Eu li, [*(**d**)o Machado de Assis]$_i$, os principais romances t_i .
[I read *(of-)the Machado de Assis the main novels]

b. [(**D**)o Machado de Assis]$_{(i)}$, eu li os principais romances (t_i) .
[(of-)the Machado de Assis I read the main novels]
['As for Machado de Assis, I read his main novels.']

(adapted from Avelar 2006:94, ex. (54))

[19] Register factors may be involved with *todos*. In some cases, like (i) below, the colloquial form *todo mundo* 'everybody' (lit.'every world') sounds better to my ears.

(i) Nessa fábrica (já) comprou ?*todos* / *todo mundo* um computador.
in-this factory(already) bought all every world a computer
'Everybody has already bought a computer in this factory.'

[20] On syntactic and interpretive asymmetries between high and low topics in BP, see Lacerda (2015, to appear).

With that in mind, under the standard assumption that DPs (and smaller categories) need to check Case in the syntax, floating of determiners, possessives, and numerals in the low left periphery is expected to be bad, as we saw in the examples (1)b-d/(2)b-d above, repeated below.

(48) a. [$_{DP}$ Aqueles [$_{NP}$ alunos]] leram essa revista = (1)b
those students read this magazine

b. [$_{PossP}$ Meus [$_{NP}$ alunos]] leram essa revista. = (1)c
my students read this magazine

c. [$_{NumP}$ Vinte/poucos [$_{NP}$ alunos]] leram essa revista. = (1)d
twenty/few students read this magazine

(49) a. *Alunos$_i$ leram [$_{FP}$ t_i [$_{DP}$ **aqueles** t_i]] essa revista = (2)b × *floating DP*
students read those this magazine

b. *Alunos$_i$ leram [$_{FP}$ t_i [$_{PossP}$ **meus** t_i]] essa revista. = (2)c × *floating PossP*
students read my this magazine

c. *Alunos$_i$ leram [$_{FP}$ t_i [$_{NumP}$ **vinte/poucos** t_i]] essa revista. = (2)d × *floating NumP*
students read twenty/few this magazine

Elements of category QP are, as we have seen, exceptional here. As is shown in the next section, quantifier floating is in fact not limited to focus positions. The neutral (and Caseless) vP area can also host the floating quantifier *cada (um)* 'each (one)'.

3.2. Thematic positions

In section 2.1 we saw that the quantifier *cada um* 'each one' can float in a neutral position, in contrast with the quantifier *todos* 'all', which cannot, as in (11), repeated below in (50).

(50) a. Os alunos$_i$ leram duas revistas **cada um** t_i . = (11)
the students read two magazines each one
'Each one of the students read two magazines.'

b. *Os alunos$_i$ leram duas revistas **todos** t_i .
the students read two magazines all
'All the students read two magazines.'

I argue that the position where *cada um* is in (50)a is Spec,vP, which is a Caseless position (with the direct object undergoing overt movement to check accusative Case in Spec,XP), as shown in (51).[21,22]. That *cada um* is indeed in a neutral position is shown by the fact that in (50)a the direct object *duas revistas* may be focalized, for instance as in response to the question in (52). Moreover, recall from (24)a above, repeated in (53) below, that *cada um* can float in that position even when *todos* is focalized and floated in the low left periphery. Interestingly, the optional deletion of the pro-form *um* 'one' (see (54)a and also (64)a below) is contingent on *cada um* floating in a thematic position.[23] When it floats in the low left periphery, as in (54)b, or when it does not float, as in (54)c, the pro-form is obligatory.

(51) [$_{TP}$ [$_{DP}$ os alunos]$_d$ leram [$_{XP}$ [duas revistas]$_k$ [$_{vP}$ [$_{QP}$ t_d [$_{Q'}$ cada [$_{NP}$ um t_d]]] t_k]]]
the students read two magazines each one

(52) Quantas revistas os alunos leram **cada um**?
how.many magazines the students read each one
'How many magazines did each of the students read?'

(53) Os alunos leram **todos** duas revistas **cada um**. = (24)a
the students read all two magazines each one
'All the students read two magazines each.'

[21] In Lacerda (2012) I argued that the structure in (51) gives rise in BP to what Safir & Stowell (1988) called "binominal *each*" in English, i.e. I proposed a uniform account of floated and binominal *cada um* in BP. A uniform account of floated and binominal *each* in English is given by Stowell (2013).
[22] This in principle goes against Bošković's (2004) generalization that quantifiers cannot float in thematic positions. He deduces this generalization from the ban on adjunction to arguments (which interferes with theta-role assignment; see Chomsky 1986), as he treats floating quantifiers as (acyclic) adjuncts of NP/DP. Given that I treat floating and pre-nominal quantifiers as uniformly heading the quantified expression (i.e. not as adjuncts) (see Lacerda 2012), Chomsky's ban on adjunction to arguments does not apply here. Therefore, the BP data presented in this section constitute valid exceptions to Bošković's generalization.
[23] Given the extraction conditions discussed in section 2.1, I assume that the pro-form *um* is present in the structure even when it is not pronounced.

(54) a. Os alunos$_i$ leram duas revistas **cada (um)** t_i .
the students read two magazines each (one)
b. Os alunos$_i$ leram **cada *(um)** t_i duas revistas.
the students read each *(one) two magazines
c. **Cada *(um) (dos alunos)** leu duas revistas
each *(one) (of-the students) read two magazines
'Each one (of the students) read two magazines.'

Subject-related *todos*, on the other hand, cannot appear to the right of the direct object because it cannot float with neutral value and it cannot be focalized in that position (FocP is higher than the position where the object checks accusative in BP). In Spanish, however, the linear counterpart of (50)b is grammatical, as shown in (55). This is possible because in Spanish *todos* can be focalized in that position.

(55) Los alumnos$_i$ han leído dos revistas **todos**$_{FOC}$ t_i . (*Spanish*)
the students have read two magazines all
'All the students read two magazines.'

Valmala (2008) argues that sentences like (55) are derived by movement of the quantifier to Spec,FocP in the high left periphery, followed by remnant movement of the clause to a higher position. This cannot account for why (50)b is bad in BP, though, especially given that (50)a is well-formed. We can account for the contrast between (50)a and (50)b by looking at the internal differences between the QP of *todos* and the QP of *cada um*, as already discussed in section 2.1. To derive the contrast between (50)b and (55), all we need is to look at the differences between the middle field of BP and Spanish. In BP, the position of the focus projection in the low left periphery is higher than the accusative position (see (56)). In Spanish, conversely, FocP is lower than the position where neutral objects surface (see (57)), as was argued by Ordóñez (2005) and is illustrated by (58), where the subject receives focus interpretation. That this is indeed a low position (and not a high right-dislocated one) is shown by the fact that the object can bind into the subject, as in (59).

(56) *Low left periphery of BP:*
verb [$_{FocP}$ [$_{XP}$ *object* [$_{vP}$]]]

(57) *Low left periphery of Spanish:*
verb [$_{XP}$ *object* [$_{FocP}$ [$_{vP}$]]] (adapted from Ordóñez 2005:41, ex.(103))

(58) Hoy comprará el almuerzo Juan$_{FOC}$.
[today will.buy the lunch Juan]
'Today Juan will buy lunch.' (Ordóñez 2005:42, ex.(105))

(59) Ayer visitó [a cada chico]$_i$ su$_i$ mentor. (Ordóñez 2005:44, ex.(111a))
[yesterday visited DOM each boy his mentor]
['Yesterday his mentor visited each boy.']

Note also that BP does not have another derivational option that is available in Spanish, as in (60)a, where *los alumnos* 'the students' is base-generated as a topic and the syntactic subject is a *pro*. Given that BP neither has referential *pro* nor licenses post-verbal nominative, (60)b is not a valid derivation and the sentence could only be derived by movement of *os alunos* 'the students', which is not possible with a neutral *todos*, given the extractability conditions imposed by the PIC and anti-locality, as discussed above.

(60) a. [Los alumnos]$_{TOP}$ *(pro)* han leído dos revistas **todos** *(pro)*. (*Spanish*)
the students have read two magazines all
b. *[Os alunos]$_{TOP}$ *(pro)* leram duas revistas **todos** *(pro)*. (*BP*)
the students read two magazines all
'All the students read two magazines.'

Apparent floating of neutral *todos* is possible, however, when the split between the quantifier and the DP involves base-generation of the DP in a position external to QP. Combined with the fact that Spanish, but not BP, allows VSO order (see (33)-(34) above), base generation will account for another contrast between the two languages. Whereas the order *DP-V-todos-DP* must involve

focalization of *todos* in BP, in Spanish the quantifier can be neutral, as shown in (61)B, where the direct object *beca* 'grant' is focalized. Assuming with Ordóñez (2005) that the neutral post-verbal subject position in Spanish is Spec,TP, *todos* may occupy this position, while *los estudiantes de física* occupies the pre-verbal subject/topic position, as represented in (62).[24] A split between neutral *todos* and a base-generated (topic) DP in BP is illustrated in (63)B. The quantifier associated with the topic occupies the neutral (pre-verbal) subject position, while the direct object is focalized, in the canonical order SVO.

(61) A: ¿Qué consiguieron todos los estudiantes de física? (*Spanish*)
what got all the students of physics?
['What have all the students of physics gotten?]
B: Los estudiantes de física consiguieron **todos** beca$_{FOC}$.
[the students of physics got all grant]
['The students of physics have all gotten a grant.']
(Valmala 2008:840, ex. (9))

(62) [$_{TopP/AgrsP}$ Los estudiantes de física consiguieron [$_{TP}$ todos [$_{FocP}$ beca]]]
the students of physics got all grant

(63) A: Which grant did all the USP students get?
B: [Os alunos da USP]$_{TOP}$, **todos** conseguiram [a bolsa da FAPESP]$_{FOC}$. (*BP*)
the students of-the USP all got the grant of-the FAPESP
'As for the USP students, all got the FAPESP grant.'

Returning to the (neutral) floating of quantifiers in *thematic* positions, it should now be noted that a contrast between *cada um* and *todos* in BP (cf. (50) above) also arises in object-related floating. Observe (64), where the DP associate of the quantifier is topicalized in the low left periphery.[25] Being

[24] Ordóñez (2007) similarly argues for a post-verbal subject position outside vP in Spanish, which he labels SubjP.
[25] Observe the doubling of the dative preposition. As the low left periphery requires that elements be Case licensed, it must be the case that it is the DP *os meninos* 'the boys' that checks dative, and the preposition on the quantifier is the extra/duplicated one. To my ears, the dative preposition on the quantifier can be marginally deleted with moved DPs (cf. (64)a) or null/absent DPs (see (i) below). I leave discussing the issue more comprehensively for future research.
(i) O Joãodeu dois livros ?(pra)cada(um).
the John gave two books (to) each(one)

in a neutral position, *cada um* in (64)a allows extraction of the DP (as it has enough internal structure), while *todos* in (64)b does not.[26] Observe that object *cada um* too allows the optionality of the realization of the pro-form *um* 'one' if it stays in its thematic position.

(64) a. Eu mostrei, pr[**os meninos**]$_i$, dois mapas pra [$_{QP}$ t_i **cada** [$_{NP}$ **(um)** t_i]].
I showed to-the boys two maps to each (one)
'I showed two maps to each one of the boys.'

b. *Eu mostrei, pr[**os meninos**]$_i$, dois mapas pra [$_{QP}$ t_i **todos** t_i].
I showed to-the boys two maps to all
'I showed two maps to all the boys.'

As we saw above, under the right conditions QP-type quantifiers can float in the vP area. Again, as expected, DPs and smaller categories cannot be licensed in constructions analogous to (50)a and (64)a, as seen in (65) and (66), respectively.[27] Regarding (66), recall that the low left periphery does not accept Caseless nominals, hence dative must be assigned to *meninos* 'boys', rather than to *aqueles três* 'those three' (see footnote 25 above); the latter DP is thus rendered Caseless, correctly ruling out the sentence (if alternatively dative is assigned to *aqueles três*, the NP *meninos* cannot be Case-licensed in the topic position).

(65) a. *Alunos$_i$ leram essa revista **aqueles** meus t_i . × *vP-floating DP*
students read this magazine those my
'Those students of mine read this magazine.'

'John gave each two books.'

[26] It is important to note that an attempted focalization of *todos* in (64)b in the low left periphery would not save the sentence, as we see in (i) below. This may be part of a more general restriction against topic and focus simultaneously moving to the low left periphery of BP, as shown by the data in (ii) and (iii).

(i) *Eu mostrei, pr[os meninos]$_i$, (ontem) TODOS t_i dois mapas.
I showed to-the boys (yesterday) all two maps
'I showed two maps to all the boys (yesterday).'

(ii) *Eu recomendei, [do Machado de Assis]$_k$, PRA MARIA dois livros t_k .
I recommended of-the Machado de Assis TO-THE MARY two books
'As for Machado de Assis, I recommend two of his books to Mary.'

(iii) *Os alunos$_i$ leram, [do Machado de Assis]$_k$, TODOS t_i as principais obras t_k .
the students read of-the Machado de Assis all the main works
'As for Machado de Assis, all the students read his main works.'

[27] An extra layer is used whenever possible to guarantee that both the PIC and anti-locality are respected.

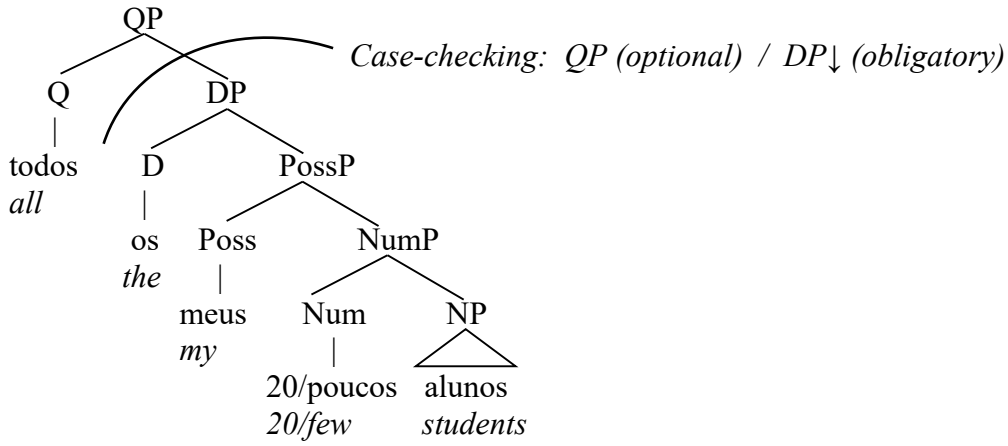
b. *Alunos$_i$ leram essa revista **meus** vinte t_i . × *vP-floating PossP*
students read this magazine my twenty
'My twenty students read this magazine.'

c. *Alunos$_i$ leram essa revista **vinte/poucos** t_i . × *vP-floating NumP*
students read this magazine twenty/few
'Twenty/few students read this magazine.'

(66) *Eu mostrei, pra [$_{NP}$ meninos]$_i$, dois mapas (pr)[$_{DP}$ t_i **aqueles** [$_{NumP}$ três t_i]].
I showed to boys two maps to those three
'I showed two maps to those three boys.'

These data provide support for the existence of the asymmetry proposed in (9), repeated below in (67). If (67) is correct, one can no longer maintain the assumption (made e.g. by Vangsnes 2001) that the quantificational layer is the one responsible for Case-checking by the nominal expression and therefore should always be present in argumental nominals. Conversely, the QP layer is the only one in the nominal domain that can circumvent syntactic Case licensing.

(67)



Evidently, QPs can check Case in the syntax — and appear as canonical (non-floated) subjects and objects. Their ability to float, as proposed here, is due to syntactic Case not being obligatory for QPs, in contrast to DPs and smaller categories.[28]

4. Final remarks

In this paper I showed that informational factors, mainly focalization, play an important role in quantifier floating in Brazilian Portuguese and Spanish. Couched within the proposal that a focalized nominal is structurally dominated by an FP layer, the different patterns of extractability of a DP out of a QP were shown to follow from the syntactic constraints imposed by the PIC and anti-locality. Given that extraction is ultimately syntactic, the comparison of BP and Spanish revealed that quantifier floating in these languages, although highly informationally-driven, is not contingent on an informational mismatch between the quantifier and its associated nominal.

I highlighted the importance of observing the precise internal structure of the QPs of different floating quantifiers, *cada um* 'each one' and *todos* 'all', in deriving their different behavior, both syntactic and informational. In Spanish, *pro* subjects and VSO order are possible, which allows for a vast array of floating (or split) structures. Brazilian Portuguese, a stricter language in that respect, thus revealed the role of the internal structure of QP in quantifier floating. Many of the considerations made here, I believe, may be extended to other Romance languages as well.

Beyond information structure, I mainly argued that the ability of QP-type quantifiers to float in Romance languages relies on them being only optionally assigned abstract Case. This property allows them to surface in Caseless positions without causing any problems at the interfaces. As we saw, this property is not limited to floating constructions, since QPs may also appear as the agents of transitive locative inversions in BP, a possibility that is excluded for other nominal categories. By observing a number of different pre-nominal functional categories in BP, and especially by comparing this language with Spanish with respect to the licensing of post-verbal subjects, we saw that the "cut-off for obligatory Case-checking" causes a division between QPs and DPs (and smaller categories).

It remains open, though, why different nominal categories may have different licensing conditions in the syntax, i.e. what makes QPs special with respect to abstract Case. As the optionally

[28] Similarly, Bošković (1995) argued that CPs are also optionally assigned Case. He argues that clauses can appear in Caseless positions, but need Case when moved to subject position or topicalized. Interestingly, CP and QP are both the highest layers in their respective domains.

Case-assigned CP and QP are both the highest layers in their respective domains (see footnote 28), observing the parallelism between the nominal and the clausal domain might be fruitful in answering that question.

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