Adjunct Control and Edge Features

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Abstract:

This paper examines a surprising correlation between adjunct control and *wh*-movement in Portuguese: object control into an adjunct clause may be allowed in addition to subject control if the matrix object undergoes *wh*-movement. Assuming Hornstein's (2001) account of adjunct control within the Movement Theory of Control and making an ammendment to Bošković's (2007) parameterization of edge features, I argue that the unexpected cases of object control arise in Portuguese when Merge-over-Move is inapplicable due to the presence of edge features on *wh*-elements.

Keywords: adjunct control, movement theory of control, sideward movement, edge features

1. Introduction[1]

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[1] Early versions of this paper were presented at GLOW 33, the V Workshop of the European Research Net in Linguistics, Romania Nova IV, the workshop *The Minimalist Program: Quo Vadis? Newborn, Reborn or Stillborn?*, and at the following universities: Buenos Aires, Connecticut, Leiden, São Paulo, and Utrecht. I am thankful to these audiences and an anonymous reviewer for comments and suggestions.

The standard generalization regarding prototypical adjunct control constructions such as (1a) below is that the subject of the adjunct clause is controlled by the matrix subject rather than the matrix object. Unsurprisingly, this subject-object asymmetry does not change if the DPs of the matrix clause involve *wh*-phrases, as shown in (1b) and (1c)— that is, subject control is still enforced.

(1) a. John_i greeted Mary_k after [$ec_{i/*k}$ entering the room]

b. [Which man]$_i$ greeted [which woman]$_k$ after [$ec_{i/*k}$ entering the room]?

c. [Which woman]$_k$ did John_i greet t_k after [$ec_{i/*k}$ entering the room]?

Portuguese introduces an intricate empirical challenge to this generalization. On the one hand, both European (*EP*) and Brazilian Portuguese (*BP*) behave like English when the matrix DPs do not involve *wh*-phrases or if the *wh*-phrases remain *in situ*, as respectively illustrated in (2) below. On the other hand, if the matrix object undergoes *wh*-movement, as shown in (3), both subject **and** object control are allowed.

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(2) a. [O João]$_i$ cumprimentou [a Maria]$_k$ depois de
the João greeted the Maria after of
[*ec*$_{i/*k}$ entrar na sala]
enter in-the room
'João greeted Maria after entering the room.'

b. [Que homem]$_i$ cumprimentou [que mulher]$_k$
which man greeted which woman
depois de [*ec*$_{i/*k}$ entrar na sala]?
after of enter in-the room
'Which man greeted which woman after entering the room?'

(3) [Que mulher]$_k$ é que [o João]$_i$ cumprimentou t_k
which woman is that the João greeted
depois de [***ec*$_{i/k}$** entrar na sala]
after of enter in-the room
'Which woman did João greet after **he/she** entered the room?'

There is an additional contrast that distinguishes the two dialects. EP and BP behave alike when infinitival adjuncts are involved, as in (2) and (3). However, if the adjunct clause is finite, as in (4), the two dialects split. In EP, the null subject of the finite adjunct may corefer with the matrix subject, the matrix object, or a discourse antecedent, regardless of the position of the potential antecedents in the matrix clause; in other words, it is not controlled. By contrast, BP replicates the pattern seen with infinitival adjuncts:

the null subject of the finite adjunct must take the matrix subject as its antecedent (see (4a-b)) unless the object undergoes *wh*-movement, in which case object control is allowed as well (see (4c)).

(4) a. [O João]$_i$ sempre cumprimenta [a Maria]$_k$
the João always greets the Maria
[quando ***ec*** entra na sala]
when enters in-the room
EP: *ec* = i/k/w **BP: *ec* = i/*k/*w**

b. [O João]$_i$ sempre cumprimenta quem$_k$
the João always greets who
[quando ***ec*** entra na sala]
when enters in-the room
EP: *ec* = i/k/w **BP: *ec* = i/*k/*w**

c. Quem$_k$ é que o João$_i$ sempre cumprimenta t_k
who is that the João always greets
quando ***ec*** entra na sala?
when enters in-the room
EP: *ec* = i/k/w **BP: *ec* = i/k/*w**
'Who does João always greet when he/she enters the room?'

The following table summarizes the facts illustrated in (1)-(4).

CONTROL INTO ADJUNCT CLAUSES				
	without *wh*-movement		**with *wh*-movement**	
	infinitives	finite clauses	infinitives	finite clauses
English	subject control	–	subject control	–
European Portuguese	subject control	–	subject or object control	–
Brazilian Portuguese	subject control	subject control	subject or object control	subject or object control

Table 1

Given the paradigm in (1)-(4), summarized in Table 1, any adequate analysis of adjunct control must then explain (i) why subject control seems to be the default case; (ii) why adjunct control in languages like Portuguese is sensitive to the position of the matrix object; and (iii) why this sensitivity also shows up in constructions involving finite adjuncts in BP, but not in

EP. In the sections that follow I will address these questions in the context of the Movement Theory of Control, henceforth *MTC*.[2]

The paper is organized as follows. In section 2, I review previous discussions of adjunct control within the MTC, showing how they fail to account for the paradigm in (1)-(4). In section 3, I offer an analysis that takes into consideration the nature of finite T in BP and makes an amendment to Bošković's (2007) proposal regarding parameterization of languages with respect to edge features. Section 4 presents additional contrasts between BP and EP that are also captured under the analysis proposed in section 3. Finally, section 5 offers some concluding remarks.

2. Previous Approaches within the Movement Theory of Control

2.1. Sideward Movement and Merge-over-Move

At first sight, adjunct control is as challenging to the MTC as it is to other minimalist approaches to control. The apparent problem can be posed in the following way. First, adjunct control virtually exhibits all the diagnostics of complement control. For instance, the null subject of an adjunct infinitival requires a local c-commanding antecedent (see (5a)), only licenses sloppy

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[2] See *e.g.* Hornstein 1999, 2001, Boeckx, Hornstein and Nunes 2010, and Hornstein and Nunes 2014.

reading under ellipsis (see (5b)), can only have a bound reading when controlled by *only*-DPs (see (5c)) and (in the appropriate type of adjuncts) only admits a *de se* interpretation (see (5d)).[3]

(5) a. $John_i$ said [that [$Mary_k$'s brother]$_m$ left [after $PRO_{m/*i/*k/*w}$ eating a bagel]]

b. John left before PRO singing and Bill did too.
'… and $Bill_i$ left before he_i/*John sang'

c. Only Churchill left after PRO giving the speech.
'[Nobody else]$_i$ left after he_i/*Churchill gave the speech'

d. The unfortunate wrote a petition (in order) PRO to get a medal
'[the unfortunate]$_i$ wrote a petition so that [he himself]$_i$ would get a medal'

Now, if these diagnostics place complement control and adjunct control under the same natural class and if complement control is derived via movement, as defended by proponents of the MTC, adjunct control should also be derived by movement. The problem then is that movement out of an adjunct should induce a CED violation.

Hornstein (1999, 2001) shows that this problem would indeed be real in a GB-like model, which assumes that all movement operations must take place after D-Structure (that is, after the whole tree has been assembled) and

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[3] See Boeckx, Hornstein, and Nunes 2010:sec. 4.5.1.

that movement is a primitive operation that leaves traces. However, both assumptions have been dropped within minimalism (see Chomsky 1995). Structures are assembled through interspersing applications of merger and movement operations, where movement is actually conceived as involving more basic operations such as Copy and the independently motivated operation of Merge. Interestingly, the combination of this approach to structure building with this reanalysis of the operation Move makes room for instances of "sideward movement".[4] That is, given two independent syntactic objects K and L, the computational system may copy α from K and merge it with L, as illustrated in (6).[5]

(6) a. $K = [\dots \alpha \dots]$

$L = [\dots]$

b. *Copy*:

$K = [\dots \alpha^i \dots]$

$L = [\dots]$

$M = \alpha^i$

c. *Merge*:

$K = [\dots \alpha^i \dots]$

$P = [\alpha^i\ [_L \dots]]$

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4 For relevant discussion, see *e.g.* Nunes 1995, 2001, 2004, 2012, Bobaljik 1995, Bobaljik and Brown 1997, Uriagereka 1998, and Hornstein 2001.

5 Copies will henceforth be annotated by superscripted indices.

Once the possibility of sideward movement is allowed, Hornstein argues, an adjunct control sentence such as (7) below can be derived along the lines of (8): *John* is copied from K and merged with L (an instance of sideward movement), yielding M in (8b), and additional computations yield the syntactic object in (8c), which surfaces as (7) after deletion of copies in the phonological component.[6] Crucially, at the derivational step when *John* moves from K to L (see (8a-b)), K is **not** an adjunct yet; K will become an adjunct only later in the derivation, after the PP headed by *after* is adjoined to vP. Hence, movement of *John* in (8a-b) does not incur in any island violation.[7]

(7) John greeted Mary after entering the room.

(8) a. K = [John entering the room]
L = [greeted Mary]

b. K = [John^{i} entering the room]
M = [John^{i} greeted Mary]

c. [John^{i} [$_{vP}$ [$_{vP}$ ~~John^{i}~~] greeted Mary] [after ~~John^{i}~~ entering the room]]

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[6] For relevant discussion, see e.g. Nunes 1995, 1999, 2004, 2011, Bošković and Nunes 2007, and the collection of papers in Corver and Nunes 2007.

[7] For further discussion, see *e.g.* Nunes and Uriagereka 2000, Nunes 2001, 2004, Hornstein 2001, and Hornstein and Nunes 2002.

Assuming that adjunct control can be derived in terms of sideward movement, the next question is why adjuncts trigger subject rather than object control. After all, sideward movement *per se* can in principle also underlie an alternative derivation for the sentence in (7), as illustrated in (9).

(9) a. K = [Mary entering the room]
L = [greeted]

b. K = [Mary^{i} entering the room]
M = [greeted Mary^{i}]

c. [John^{k} [$_{vP}$ [$_{vP}$ ~~John^{k}~~] greeted Mary^{i}] [after ~~Mary^{i}~~ entering the room]]

In (9), *Mary* undergoes sideward movement and merges with *greeted* and *John* is inserted later on in the derivation, yielding the structure in (9c), which should give rise to an object control reading, unavailable in (7).

Hornstein (1999, 2001) argues that the derivation in (9) does indeed converge, but is ruled out by economy considerations. More specifically, at the derivational step sketched in (10) below, the computational system has two options to allow for the internal θ-role of *greeted* to be assigned: either select *John* from the numeration and merge it with *greeted* or (sideward)

move *Mary*, as in (9a-b).[8] Under the assumption that all things being equal, merger preempts movement (Chomsky 1995), the derivation in (9) is then excluded by the competing derivation in (11), which merges *John* in the object position of (10) before sideward moving *Mary*. Again, the final structure in (11c) should only support a subject control reading and this is exactly

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[8] The fact that in (10) the computational system is dealing with more than one root syntactic object at a time is not something new. In a model that assumes Chomsky's (1995) Extension Condition, the computational system must independently handle more than one root syntactic object to build complex specifiers or complex adjuncts. In the derivation of a simple sentence like *The boy saw her*, for instance, if *boy* merges with *[saw her]* immediately after being selected from the numeration, the Extension Condition will prevent *the* from later merging with *boy* in the structure *[boy [saw her]]*. Thus, there must be a derivational step in which *the*, *boy* and *[saw her]* are root syntactic objects, making it possible for *the* to merge with *boy*, in compliance with the Extension Condition. Once the computational system must independently deal with more than root one syntatic at a time, one can argue that moving from one root syntactic object to another does not add too much complexity to the system (even more so if Move involves Merge). At any rate, it should be observed that the computational complexity associated with sideward movement can be substantially reduced if we assume with Chomsky (2000) that a numeration is actually composed of subarrays, each of which containing one instance of a (strong) phase head, and that the computational system activates one subarray at a time (see Nunes and Uriagereka 2000 and Nunes, 2001, 2004, 2012 for relevant discussion). For purposes of presentation, I will put these issues aside and in the discussion that follows I simply assume with Chomsky (1995) that in order for derivations to be compared, they must start from the same numeration and employ the same computational steps up to the point of the comparison.

how the resulting sentence in (11d) is interpreted. In sum, the combination of sideward movement with the Merge-over-Move economy metrics derives the fact that sentence such as (7) can only admit a subject control interpretation.[9]

(10) N = {John$_1$, greeted$_0$, **Mary$_0$**, after$_1$, entering$_0$, the$_0$, room$_0$}
K = [Mary entering the room]
M = [greeted]

(11) a. K = [Mary entering the room]
L = [greeted John]

b. K = [Mary^i entering the room]
M = [Mary^i greeted John]

c. [Mary^i [$_{vP}$ [$_{vP}$ ~~Mary^i~~] greeted John] [after ~~Mary^i~~ entering the room]]

d. Mary$_i$ greeted John$_k$ after ***ec$_{i/*k}$*** entering the room.

Although Hornstein's approach succeeds in deriving this subject-object asymmetry in adjunct control from more basic assumptions, it does not make room to accommodate the Portuguese facts reported in the introduction. Recall that in Portuguese, object control in adjunct constructions can

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[9] For arguments that sideward movement does not overgenerate, being constrained by the same conditions that restrict upward movement, see Nunes 2001, 2004, Hornstein 2001, and especially Nunes 2012:sec. 6.3.

be allowed in addition to subject control when the matrix object undergoes *wh*-movement (see (3) and (4c)). Unfortunately, there is nothing in Hornstein's proposal that we could rely on to account for this fact. Crucially, economy computations of the type examined here are evaluated in a local fashion. The choice between merging *John* or sideward moving *Mary* in (10), for example, must be made **at this derivational step,** without taking into account any later operations that *John* or *Mary* may be subject to. Unless, of course, such later operations are somehow detected at this derivational step and this detection somehow makes things unequal, preventing merger and movement from being compared for economy purposes. This is the sort of approach I will explore in section 3.2.

2.2. Adjunct control in Portuguese and parasitic gaps

The unexpected pattern of adjunct control in (Brazilian) Portuguese came to the forth in the debate on the nature of null subjects of finite clauses in BP. Modesto (2000) presented contrasts such as (12) below as evidence against proposals by Ferreira (2000) and Rodrigues (2002), according to which referential null subjects in BP are traces of movement.[10] The reasoning has two

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[10] Modesto's (2000) judgments for the subject reading in (12b) is actually "?*", whereas for Rodrigues (2004) the two readings of (12b) are judged as fully grammatical. My own judgments and the judgments of all speakers I consulted are in consonance with Rodrigues's. Thus, in the following discussion I will represent the

steps: (i) under the MTC, object control in a sentence such as (13) is enforced by minimality; the object position is the closest (c-commanding) landing site for a DP undergoing A-movement from the embedded clause (see Hornstein 1999, 2001); (ii) given that (12) involves an object control verb, if the null subject of (12) were an A-trace, one should find only object control, as we see in (13), and not subject control only, as in (12a), or either reading, as in (12b).

(12) a. [O Paulo]$_1$ convenceu [o Pedro]$_2$ que
the Paulo convinced the Pedro that
ec$_{1/*2}$ tinha que ir embora (BP)
had that go away
'Paulo$_1$ convinced Pedro$_2$ that he$_2$ had to leave?'

b. Quem$_1$ que [o Pedro]$_2$ convenceu t_1 que
who that the Pedro convinced that
ec$_{1/2}$ tinha que ir embora (BP)
had that go away
'Who$_1$ did Pedro convince that he$_{1/2}$ had to leave?'

(13) [O Pedro]$_1$ convenceu [a Maria]$_2$ [***ec$_{2/*1}$*** a sair]
the Pedro convinced the Maria to leave

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subject reading of sentences such as (12b) as fully grammatical, rather than marginal.

'Pedro convinced Maria to leave.'

Modesto's argument is crystal clear, but conceptually flawed. The fact that the matrix verb is the same in (12) and (13) by itself does not ensure that the corresponding structures are necessarily parallel.[11] In fact, Ferreira (2000, 2009) shows that in structures like (12) the matrix object does not c-command the embedded subject, as illustrated by the lack of Principle C effect in (14).[12] If so, the matrix object does not count as a proper intervener

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11 In BP the pattern in (12) is also found with verbs like *persuadir* 'persuade', *avisar* 'warn', *ameaçar* 'threaten', and *alertar* 'call attention to', for instance.

12 As observed by a reviewer, the point illustrated in (14) would be strengthened if replacement of *a Maria* by a pronoun should not change the grammatical status of the sentence, also allowing coreference between the pronoun and the epithet. Judgements are not as clearcut as one would like due to an interfering factor. As pointed out by Rodrigues (2004) in response to a similar issue raised by Juan Uriagereka, pronouns in BP generally resist taking an antecedent to their right even when they do not c-command it, as shown in (i) below. Thus, a sentence such as (ii), which is the one the reviewer had in mind, tends to be judged as unacceptable under the intended reading, unless used in a pragmatic salient context such as a response to the question *E a Maria?* 'What about Maria?'. Interestingly, though, a canonical infinitival object control structure such as (iii) is uniformly judged as unacceptable even when the relevant reading is primed with this question. This indicates that once interefering factors are controlled for, Rodrigues's (2004) proposal that the embedded finite clause in sentences like (12), (14), (15) and (ii) below does not syntactically behave like a standard complement can indeed be maintained.

and the subject control reading in (12a) is not unexpected. Furthermore, as shown by Rodrigues (2004) and Nunes (2009), the embedded finite clauses of (12) behave more like adjuncts rather than complements, in that they block extraction, as illustrated in (15).

(14) O João convenceu [a Maria]$_i$ [que [a idiota]$_i$ deveria
the João convinced the Maria that the idiot should
assaltar um banco] (BP)
rob a bank
'João convinced Maria$_i$ that [the idiot]$_i$ should rob a bank'

(15) a. ??Quem$_i$ o João convenceu a Maria
who the João convinced the Maria
[que t_i vem amanhã]? (BP)

(i) *O pai dela$_i$ ama [a Maria]$_i$
the father of-her loves the Maria
'Her$_i$ father loves Maria$_i$'

(ii) O João convenceu ela$_i$ [que [a idiota]$_i$ deveria assaltar um banco]
the João convinced her that the idiot should rob a bank
'João convinced her$_i$ that [the idiot]$_i$ should rob a bank'

(iii) *O João convenceu ela$_i$ a dizer [que [a idiota]$_i$ deveria assaltar um banco]
the João convinced her to say that the idiot should rob a bank
*'João convinced her$_i$ to say that [the idiot]$_i$ should rob a bank'

that comes tomorrow

'Who did João convince Maria [will come tomorrow]?'

b. *Como$_i$ o João convenceu a Maria

how the João convinced the Maria

[que o Pedro tinha (BP)

that the Pedro had

que se vestir para a festa t_i]?

that REFL dress for the party

'How$_i$ did João convince Mary [that Pedro had to dress for the party t_i]?'

Finally, Rodrigues (2004) shows that the pattern found by Modesto in (12) (see footnote 10) also shows up in uncontroversial cases of adjunct clauses in BP. In (16), for instance, the matrix subject can always control the subject of the adjunct clause, but the matrix object can do so just in case it undergoes overt *wh*-movement (see (16b)).[13]

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[13] A reviewer asks whether the finite complement of verbs like *convencer* 'convince' in BP also behaves like an adjunct in licensing parasitic gaps. It does, as shown in (i). And as we should expect by now, a true object control structure does not, as illustrated in (ii). I am thankful to the reviewer for bringing this issue to my attention.

(i) Foi [esse aluno]$_i$ que a Maria convenceu t_i que o professor ia

was this student that the Maria convinced that the teacher went

reprovar PG_i

(16) a. [O João]$_i$ repreendeu quem$_k$ quando

the João reprehended who when

***ec*$_{i/*k}$** entrou na sala? (BP)

entered in-the room

'Who did João$_i$ reprehend when he$_i$ entered the room?'

b. Quem$_k$ [o João]$_i$ repreendeu t_k quando

who the João reprehended when

***ec*$_{i/k}$** entrou na sala? (BP)

entered in-the room

'Who$_k$ did João$_i$ reprehend when he$_{i/k}$ entered the room?'

Once the data in (14)-(16) show that (12) cannot be taken as counterevidence to the MTC at face value, the question now is how to account for the

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fail

'It was [this student]$_i$ that Maria convinced t_i that the teacher was going to fail him$_i$'

(ii) *Foi [esse aluno]$_i$ que a Maria convenceu t_i a dizer que o professor ia

was this student that the Maria convinced to say that the teacher went

reprovar *PG*$_i$

fail

'It was [this student]$_i$ that Maria convinced t_i that the teacher was going to fail him$_i$'

pattern in (16). If the null subjects in (16) are traces of (sideward movement) out of the embedded clause, Merge-over-Move computations should lead us to expect subject control reading only, as discussed in section 2.1. Following a suggestion by Norbert Hornstein, Rodrigues (2004) speculates that the pattern in (16) should be captured along the lines of Hornstein's (2001) derivation of parasitic gaps. As is well known (see *e.g.* Chomsky 1982), a *wh*-phrase can license a parasitic gap if undergoes A'-movement, but not if it remains *in* situ (see (17) below). In an analogous way, a *wh*-phrase *in situ* cannot license object control into an adjunct clause in BP (see (16a)), but a moved *wh*-phrase can (see (16b)).

(17) a. *Who filed **[which paper]**$_{\mathbf{k}}$ without reading ***PG***$_{\boldsymbol{k}}$?

b. **[Which paper]**$_{\mathbf{k}}$ did you file $\mathbf{t}_{\mathbf{k}}$ after reading ***PG***$_{\mathbf{k}}$?

Although Rodrigues does not elaborate on how exactly the parallel behavior between (16) and (17) is to be technically captured, there are three potential problems for such a unifying approach. First, if (16a) is to receive the same derivational analysis as (17a), one must explain why overt *wh*-movement of a matrix object does not license object control in languages like English in the same way it is able to license a parasitic gap (see (17b)). In other words, why do we have only subject control in a sentence such as (18), and not two readings as in (16b)?

(18) **Who**$_{\mathbf{i}}$ did John$_{\mathrm{k}}$ greet $\boldsymbol{t}_{\mathbf{k/*i}}$ after $\boldsymbol{ec}_{\mathbf{i}}$ entering the room?

Second, in a derivation of parasitic gap constructions based on sideward movement, a violation of Merge-over-Move is allowed only if it is the only convergent option (see Nunes 1995, 2001, 2004, Hornstein 2001). However, this is inconsistent with there being two readings in (16b). As shown in (19) below, the subject control reading of (16b) complies with Merge-over-Move in that *quem* is merged with the matrix verb (see (19b)) before sideward movement of *o João* (see (19c)). On the other hand, the derivation of the object control reading of (16b) violates Merge-over-Move, for *quem* moves to the embedded object position (see (20b)) before *o João* is merged (see (20c)). Given that (19) converges, we should in principle expect it to block the derivation of (20), contrary to fact.

(19) a. K = [[o João] entrou na sala]

L = [repreendeu]

b. K = [[o João] entrou na sala]

L = [repreendeu **quem**]

c. K = [**[o João]**^{i} entrou na sala]

M = [**[o João]**^{i} repreendeu quem]

d. [$_{CP}$ Quem^{k} [$_{TP}$ [o João]^{i} [$_{vP}$ ~~[o João]~~^{i} [$_{vP}$ repreendeu ~~quem~~^{k}]

who the João the João reprehended who

[quando ~~[o João]~~^{i} entrou na sala]]]]?

when the João entered in-the room

(20) a. K = [quem entrou na sala]

L = [repreendeu]

b. K = [**quem**$^{\mathbf{i}}$ entrou na sala]

L = [repreendeu **quem**$^{\mathbf{i}}$]

c. K = [quem^{i} entrou na sala]

M = [**[o João]** repreendeu quem^{i}]

d. [$_{CP}$ Quem^{k} [$_{TP}$ [o João]^{i} [$_{vP}$ ~~[o João]^{i}~~ [$_{vP}$ repreendeu ~~quem~~^{k}]

who the João the João reprehended who

[quando ~~quem~~ entrou na sala]]]]?

when who entered in-the room

Finally, one should not ascribe the unexpected pattern of (16) to idiosyncrasies of BP, for the same pattern arises for ***both*** BP and EP when infinitival adjuncts are concerned, as illustrated in (21) (see (3)), a fact that has not been observed in the literature.

(21) **Quem$_{i}$** é que o João$_{k}$ cumprimentou ***t*$_{i}$** depois de

who is that the João greeted after of

***ec*$_{i/k}$** entrar na sala? (BP/EP)

enter in-the room

'Who$_{i}$ did John$_{k}$ greet after he$_{i/k}$ entered the room?'

2.3. Summary

From the discussion of Hornstein's (1999, 2001) Merge-over-Move approach to adjunct control in section 2.1, we concluded that there appeared to be no room for the kind of parametric variation required to account for Portuguese if economy is to be computed in a local fashion. From the problems faced by Rodrigues's (2004) suggestion that adjunct control in BP should be derived in terms of parasitic gaps, we can conclude that there must be a parametric property that distinguishes Portuguese from English regarding control into infinitival adjuncts and a distinct property that distinguishes EP and BP when finite adjuncts are concerned.

Below I outline an analysis that makes the relevant parametric cuts and, importantly, allows us to keep Hornstein's Merge-over-Move approach computed in a local fashion.

3. Towards an analysis of adjunct control in Portuguese

3.1. The nature of finite T in BP

It has been a point of consensus in the literature that referential[14] null subjects in BP are considerably different from their EP cousins, which have

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[14] The term *referential* here is meant to exclude null expletives, null "arbitrary" third person subjects, and gaps resulting from topic deletion, which are allowed in BP. From now on, I will drop this qualification as these other types of null subjects will not be relevant to our discussion.

been standardly analyzed as *pro*s.[15] However, when it comes to characterizing the nature of BP null subjects, no such consensus in found. Here I will be following Ferreira (2000, 2009) and Rodrigues (2002, 2004), who assume the MTC and argue that given that BP null subjects pattern like obligatorily controlled PRO, they should accordingly be analyzed as traces (deleted copies) left by movement of the "antecedent". As illustrated in (22), a null subject in BP mimics the behavior of a controlled PRO/A-trace in that it requires an antecedent (see (22a)) which must be in a c-commanding (see (22b)) and local (see (22c)) configuration; it requires a bound-reading when anteceded by an *only*-DP (see (22d)); it only supports sloppy readings under ellipsis (see (22e)); and it obligatorily triggers *de se* interpretation in "unfortunate"-contexts (see (22f)):

(22) a. ****ec*** comprou um carro novo.
bought a car new
'She/he bought a new car.'

b. [A mãe d[a Maria]$_i$]$_k$ acha que ***ec***$_{k/*i}$ está grávida
the mother of-the Maria thinks that is pregnant
'[Maria's mother]$_k$ thinks she$_k$ is pregnant.'

c. *Ela$_i$ disse que [a Maria]$_k$ acha que ***ec***$_{k/*i}$ está grávida

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[15] For references and relevant discussion, see e.g. Galves 1987, 1993, 2001, Duarte 1995, Figueiredo Silva 1996, Kato 1999, 2000, Negrão 1999, Ferreira 2000, 2009, Modesto 2000, Rodrigues 2002, 2004, Martins and Nunes 2005, 2009, Nunes 2008, Petersen 2011, and the collection of papers in Kato and Negrão 2000.

she said that the Maria thinks that is pregnant

'She said that Maria$_k$ thinks she$_k$ is pregnant.'

d. Só o João acha que ***ec*** vai ganhar a corrida.

only the João thinks that goes win the race.

'Only João is an x such that x thinks that x will win the race.'

NOT: 'Only João is an x such that x thinks that he, João, will win the race.'

e. O João está achando que ***ec*** vai ganhar a

the João is thinking that goes wih the

corrida e o Pedro também está.

race and the Pedro too is

'João thinks that that he's going to win the race and Pedro does, too (think that he, Pedro, is going to win the race).'

NOT: 'João thinks that that he's going to win the race and Pedro does, too (think that he, João, is going to win the race).'

f. O infeliz acha que ***ec*** devia receber uma medalha.

the unfortunate thinks that should receive a medal

'The unfortunate thinks the he, himself, should receive a medal.'

If null subjects in BP are traces, one has to account for how the relevant embedded subject can move out of a finite domain, which is generally associated with Case-checking/valuation. Within Chomsky's (2000) Agree-based system, for example, a finite T values the Case of a DP in its Spec, rendering it inert for purposes of A-movement. Following Ferreira (2000,

2009), I assume that with the weakening of verbal agreement morphology in BP (see *e.g.* Duarte 1995), its finite Ts ceased to license *pro* (see footnote 13) and came to be optionally specified with a complete or an incomplete set of ϕ-features. More concretely, I adopt Nunes's (2008) reinterpretation of Ferreira's proposal in terms of the features person and number. Based on the pervasive syncretism involving person and number in (colloquial) BP, Nunes (2008) proposes that finite Ts in BP can be associated with person and number or number only. In the former case, they check/value the Case feature of their subject, freezing it for purposes of A-movement; in the latter, T is unable to check/value the Case of its subject, which may then move to a Case licensing position. The derivation of a sentence such as (23a), for example, proceeds along the lines of (23b), with the embedded T bearing only number and the matrix T bearing person and person.

(23) a. Ele disse que comprou um carro.
he said that bought a car
'He$_i$ said that he$_i$ bought a car.'

b. [$_{TP}$ ele$_i$ **T$_{[p, n]}$** [$_{vP}$ t_i [$_{VP}$ disse [$_{CP}$ que [$_{TP}$ t_i **T$_{[n]}$** [$_{vP}$ t_i [$_{VP}$ comprou um carro]]]]]]]

Of course, the assumption that finite Ts may be ϕ-incomplete applies to all kinds of clauses, including adjuncts. Hence, the fact that a finite adjunct clause in BP behaves like an infinitival adjunct is exactly what we would

expect. If the T head of the finite adjunct bears only a number feature, its subject is still active for purposes of A-movement and may undergo (sideward) movement. Thus, we have a straightforward account for the contrast between BP and EP in what concerns finite adjunct clauses. Recall that in EP, the subject of the finite adjunct in a sentence such as (24) below (see (4)), may co-refer with the matrix subject, the matrix object, or a discourse antecedent. By contrast, in BP the embedded subject must take the matrix subject as its antecedent. This dissimilarity is a reflex of the nature of the finite T in each language. As EP is a prototypical pro-drop language, its finite Ts are ϕ-complete and may license *pro*s in their specifiers; hence, the reference of the null subject in (24) is completely free in EP as it is based on the possible interpretations for *pro*. On the other hand, finite Ts in BP do not license referential *pro* and if ϕ-incomplete, they do not deactivate the Case feature of their subjects. Hence, the derivation of (24) in BP proceeds along the lines of (25) (with English words for purposes of exposition).

(24) [O João]$_i$ não cumprimentou [a Maria]$_k$ [quando
the João not greeted the Maria when
ec entrou na sala]
enteed in-the room
EP: *ec* = i/k/w **BP: *ec* = i/*k/*w**

(25) *Brazilian Portuguese*:

a. N = {João$_0$, T$_{[p, n]1}$, not$_1$, greeted$_0$,Maria$_1$, when$_1$, T$_{[n]0}$, entered$_0$, the$_0$, room$_0$}

K = [João T$_{[n]}$ entered the room]

L = [greeted]

b. K = [João T$_{[n]}$ entered the room]

M = [greeted Maria]

c. K = [João^i T$_{[n]}$ entered the room]

P = [João^i greeted Maria]

d. [João T$_{[p, n]}$ not [$_{vP}$ [$_{vP}$ ~~João~~^{i} greeted Maria] [when ~~João~~^{i} T$_{[n]}$ entered the room]]]

Given the derivational step in (25a), the verb *greeted* may have its θ-requirements satisfied in one of two ways: via selection and merger of *Maria* or via (sideward) movement of *João*. Crucially, *João* is still active because the ϕ-incomplete T of its clause was unable to check/value its Case. The two competing derivations are then evaluated for economy purposes and Merge-over-Move is enforced, preventing sideward movement of *John* at the derivational step in (25a) (see (25b)). Later on, after *Mary* has been plugged into the structure, *John* finally undergoes sideward movement (see (25c)) and has its Case licensed by the ϕ-complete T head of the matrix clause (see (25d)). The winning derivation only supports the subject control reading, as desired.

To summarize. In order to undergo A-movement, be it upward or sideward movement, a DP must have its Case unchecked/unvalued. In the case of adjunct control into infinitival clauses, the infinitival T head is ϕ-defective, allowing its subject to undergo sideward movement to the matrix derivational space. However, Merge-over-Move must be observed and such sideward movement can only take place after the matrix object position has been filled by material from the numeration. Hence, Merge-over-Move enforces subject control in constructions involving infinitival adjuncts. BP is a marked language in the sense that its finite Ts may be underspecified for ϕ-features, in which case a finite adjunct behaves like an infinitival adjunct for purposes of sideward movement of their subjects. Thus, it is not surprising that BP adjuncts behave alike with respect to control, regardless of their tense specifications.

What remains to be explained is why *wh*-movement of the matrix object may alter control possibilities in Portuguese, but not in English. This is the topic of the next section.

3.2. Adjunct control and the locus *of edge features*

In this section I look for independent properties that may underlie the different behavior between English and Portuguese with respect to their (in)sensitivity to the position of the matrix object in (dis)allowing object control into adjunct clauses. My starting point will be Bošković's (2007)

reanalysis of Chomsky's (2001) implementation of sucessive cyclic movement.

To account for long distance movement in consonance with the Phase Impenetrability Condition, Chomsky (2001) proposes that the head of a strong phase may be optionally assigned an EPP-type of feature, which triggers movement to the edge of the phase. In the derivation of a sentence such as (26), for instance, the computational system assigns this EPP-type of feature to each phase head after the phase is completed, as sketched in (27).

(26) What did John say that Mary bought?

(27) a. $[_{vP}$ Mary **v**+bought what$]$ $\rightarrow_{\text{EPP assignment}}$

b. $[_{vP}$ Mary $\mathbf{v_{EPP}}$+bought what$]$

c. $[_{vP}$ **what**$_i$ $[_{v'}$ Mary $\mathbf{v}_{\mathbf{\underline{EPP}}}$+bought $\boldsymbol{t}_i]]$

d. $[_{CP}$ **that** $[_{TP}$ Mary$_k$ $[_{vP}$ what$_i$ $[_{v'}$ t_k $v_{\underline{EPP}}$+bought $t_i]]]]$ $\rightarrow_{\text{EPP assignment}}$

e. $[_{CP}$ **that**$_{\mathbf{EPP}}$ $[_{TP}$ Mary$_k$ $[_{vP}$ what$_i$ $[_{v'}$ t_k $v_{\underline{EPP}}$+bought $t_i]]]]$

f. $[_{CP}$ **what**$_i$ $[_{C'}$ **that**$_{\mathbf{\underline{EPP}}}$ $[_{TP}$ Mary $[_{vP}$ $\boldsymbol{t}_i$ $[_{v'}$ Mary $v_{\underline{EPP}}$+bought $t_i]]]]]$

g. $[_{vP}$ John **v**+say $[_{CP}$ what$_i$ $[_{C'}$ that$_{\underline{EPP}}$ $[_{TP}$ ...$]]]]$ $\rightarrow_{\text{EPP assignment}}$

h. $[_{vP}$ John $\mathbf{v_{EPP}}$+say $[_{CP}$ what$_i$ $[_{C'}$ that$_{\underline{EPP}}$ $[_{TP}$ ...$]]]]$

i. $[_{vP}$ **what**$_i$ $[_{v'}$ John $\mathbf{v}_{\mathbf{\underline{EPP}}}$+say $[_{CP}$ $\boldsymbol{t}_i$ $[_{C'}$ that$_{\underline{EPP}}$ $[_{TP}$ ...$]]]]]$

j. $[_{CP}$ did $[_{TP}$ John$_m$ $[_{vP}$ what$_i$ $[_{v'}$ t_m $v_{\underline{EPP}}$+say $[_{CP}$ ...$]]]]]$ $\rightarrow_{\text{EPP assignment}}$

k. $[_{CP}$ **did**$_{\mathbf{EPP}}$ $[_{TP}$ John$_m$ $[_{vP}$ what$_i$ $[_{v'}$ t_m $v_{\underline{EPP}}$+say $[_{CP}$ ...$]]]]]$

l. $[_{CP}$ **what**$_i$ $[_{C'}$ **did**$_{\mathbf{\underline{EPP}}}$ $[_{TP}$ John$_m$ $[_{vP}$ $\boldsymbol{t}_i$ $[_{v'}$ t_m $v_{\underline{EPP}}$+say $[_{CP}$ ...$]]]]]$

As Bošković's (2007) correctly points out, once the EPP assignment to a given phase head is completly independent from the assignment to another head, the system overgenerates. In particular, it incorrectly rules in a sentences like (28) below under a derivation where the lowest phase heads have been assigned EPP. Furthermore, (28) cannot be excluded in a local fashion. Crucially, one cannot exclude the derivational step in (29), for it also underlies the derivation of the grammatical sentence in (26) (see (27f)).

(28) *Who thinks what Mary bought.

(29) [$_{CP}$ **what$_i$** [$_{C'}$ **that~~$_{EPP}$~~** [$_{TP}$ Mary [$_{vP}$ ***t*$_i$** [$_{v'}$ Mary v~~$_{EPP}$~~+bought t_i]]]]]

For Bošković (2007), the key of the problem is that in Chomsky's system, the edge feature is hosted by the potential target of movement and not by the moving element itself. He then proposes an alternative according to which the uninterpretable edge feature that triggers successive cyclic movement (*uF)* is hosted by the moving element and must function as a probe in order to be licensed. This amounts to saying that a *wh*-phrase specified for uF must end up in the specifier of an interrogative C in order to be appropriately licensed. As far as crosslinguistic variation goes, Bošković proposes the parameterization sketched in (30): in multiple *wh*-fronting languages like Bulgarian, all *wh*-phrases are specified for uF; in *wh-in situ* languages such as Korean, their *wh*-phrases do not have uF; and in languages like English, the *wh*-phrases are optionally specified for uF.

(30) a. Bulgarian *wh*-phrases: uF

b. Korean *wh*-phrases: iF

c. English *wh*-phrases: (uF)

Here I will focus on the specification in (30c). According to (30c), a *wh*-phase in English may optionally bear uF. But if it does, it must move all the way to the Spec of an interrogative C, in order to be licensed. This is the case of *what* in (26), as sketched in (31) below, but not in (28), as sketched in (32). In order for the *wh*-phrase of (28) to move, it must have come into the derivation specified for uF; otherwise it would simply remain *in situ*. However, if it bears uF, it must move to the Spec of an interrogative C and this is not what happens. An advantage of this alternative, as Bošković (2007) points out, is that lack of convergence may be detected in a local fashion. The presence of uF in the lower chunk of structure in (32), for example, tells the system that that is not a convergent object, regardless of further computations down the road.

(31) [**what**$_{\surd \mathbf{uF}}$ did John [$_{t}$ say [*t* that Mary [*t* bought *t*]]]]

(32) *[John thinks [**what**$_{\mathbf{uF}}$ Mary bought *t*]]

Assuming with Bošković (2007) that edge features are hosted by the elements that undergo movement rather than phase heads, I would like to make

the following amendment to his proposal regarding the parameterization specification in (30c):

(33) a. Portuguese *wh*-phrases: uF is **lexically** optional

b. English *wh*-phrases: uF is optionally **assigned during the computation**

I propose that what Bošković ascribed to English actually describes Portuguese. As for languages like English, I contend that uF is optionally assigned to wh-phrases, as in Bošković's system, but in the course of the computation and not lexically, as in Chomsky's (2001) system.

That some formal distinction between Portuguese and English regarding wh-movement should be made is not contentious. After all, the two languages do not always pattern alike. For instance, as opposed to what happens in English (see (34) below), the *in situ* possibility in Portuguese is not contingent on the presence of another *wh*-phrase (see (35a)). Furthermore, as opposed to languages like French (see Bošković 1998, Cheng and Rooryck 2000), *wh*-in situ in simple questions is not restricted to main clauses (see (35b)).

(34) a. *John gave what to Mary?

b. Who gave what to Mary?

(35) a. O João deu o que pra Maria?

the João gave what to-the Maria

'What did João give to Maria?'

b. O Pedro acha que o João deu o que pra Maria?

the Pedro thinks that the João gave what to-the Maria

'What does Pedro think that João gave to Maria?'

I argue below that the amendment in (33) not only keeps the virtues of Bošković's (2007) system as far as local computations in successive cyclic movement are concerned, but also paves the way to account for the intricate pattern of control possibilities in Portuguese adjunct clauses. Let us reexamine the paradigm of (4), repeated here in (36), for instance.

(36) a. [O João]$_i$ sempre cumprimenta [a Maria]$_k$

the João always greets the Maria

[quando ***ec*** entra na sala]

when enters in-the room

EP: *ec* = i/k/w **BP: *ec* = i/*k/*w**

b. [O João]$_i$ sempre cumprimenta quem$_k$

the João always greets who

[quando ***ec*** entra na sala]

when enters in-the room

EP: *ec* = i/k/w **BP: *ec* = i/*k/*w**

c. Quem$_k$ é que o João$_i$ sempre cumprimenta t_k

who is that the João always greets

quando ***ec***	entra	na	sala?
when	*enters*	*in-the*	*room*

EP: *ec* = i/k/w **BP: *ec* = i/k/*w**

'Who does João always greet when he/she enters the room?'

Recall that EP is a prototypical pro-drop language. Thus, the subject of the finite adjuncts in (36) is a *pro* in EP. That being so, the ϕ-complete T of the adjunct clause checks/values the Case-feature of *pro*, which then becomes inactive for purposes of A-movement, be it upward or sideward movement. The interpretation of the null subject of the adjunct clause is therefore a matter of *pro*-licensing and not of control. Hence, whether or not there is *wh*-movement in the matrix domain is completely irrelevant for the interpretation of *pro*, which may pick up the matrix subject, the matrix object, or any other salient DP in the discourse as its antecedent.

BP, on the other hand, is much more interesting in this regard. The null subject in the sentences in (36), for instance, is a trace of sideward movement in BP and Merge-over-Move should in principle enforce only the subject control reading (see section 3.1). This holds true of (36a) and (36b), but not of (36c), where the object undergoes *wh*-movement. According to the amendment proposed in (33a), the derivations of (36b) and (36c) must actually be evaluated under two scenarios depending on whether or not the *wh*-phrase is lexically specified for uF. Let us consider each possibility in turn.

Suppose *quem* is not lexically specified as hosting uF and the computational system has reached the derivational step in (37).

(37) N = {o$_i$, João$_i$, T$_{[p, n]1}$, sempre$_1$, cumprimenta$_0$, quem$_0$, quando$_1$, T$_{[n]0}$, entra$_0$, em$_0$, a$_0$, sala$_0$}

K = [quem entra na sala]

who enters in-the room

L = [cumprimenta]

greets

Here, *quem* does not differ from *a Maria* in (36a) as far as economy computations go. If it is not lexically specified for an edge feature, Merge-over-Move is enforced and *quem* in (37) only undergoes sideward movement after merger of *o João* in the object position, as shown in (38),yielding the familiar pattern of subject control into an adjunct clause seen in (36b) for BP.

(38) [$_{TP}$ Quem^i sempre [$_{vP}$ [$_{vP}$ ~~quem~~^{i} cumprimenta o João]

who always who greets the João

[quando ~~quem~~^{i} entra na sala]]]

when who enters in-the room

'Who$_i$ always greets João when he$_i$ enters the room?'

Now suppose *quem* is lexically specified for uF and the computation reaches the step sketched in (39).

(39) N = {o$_1$, João$_1$, T$_{[p, n]1}$, sempre$_1$, cumprimenta$_0$, quem$_0$, quando$_1$, T$_{[n]0}$, entra$_0$, em$_0$, a$_0$, sala$_0$}

K = [**quem$_{uF}$** entra na sala]

who enters in-the room

L = [cumprimenta]

greets

As opposed to the state of affairs in (37), here all things are not equal. The edge feature of *quem* is saying that it must move if possible. So, one can argue that in these circumstances, Merge-over-Move is inapplicable, for uF's requirement must be satisfied. If so, *quem* moves to the object position of the matrix verb and *o João* is later merged as the external argument. Crucially, however, *quem* cannot remain in the matrix object position. As shown in (40) below, its uF has not been checked and as such, it tells the system that the matrix vP phase is not a convergent syntactic object as it contains an unlicensed feature. Of course, if *quem* keeps moving until it reaches the matrix [Spec,CP], as illustrated in (41), the derivation will converge for its uF feature will be licensed. Hence, the contrast in BP between (36b) and (36c) with respect to object control.

(40) *O João sempre [[cumprimenta **quem$_{uF}$**]

the João always greets who

[quando ~~**quem$_{uF}$**~~ entra na sala]]

when enters in-the room

'Who$_i$ does João always greet when he$_i$ enters the room?'

(41) **Quem$_{\surd uF}$** o João sempre [~~**quem$_{uF}$**~~ [[cumprimenta ~~**quem$_{uF}$**~~]
who the João always who greets who
[quando ~~**quem$_{uF}$**~~ entra na sala]]]
when who enters in-the room
'Who$_i$ does João$_k$ always greet when he$_{i/k}$ enters the room?'

To put it general terms, we have just derived the generalization that in BP an *in situ* matrix object cannot control into an adjunct, but a *wh*-moved object can. In a sense, the intriguing contrast between (36b) and (36c) in BP reduces to Bošković's (2007) account of the contrast between (26) and (28) in terms of the structures in (42) (see (31)-(32)).

(42) a. *[John thinks [**what$_{uF}$** Mary bought *t*]]
b. [**what$_{\surd uF}$** did John [$_t$ say [*t* that Mary [*t* bought *t*]]]]

As for infinitival adjuncts, recall that BP and EP behave alike, as exemplified in (43) below.

(43) a. [O João]$_i$ cumprimentou quem$_k$ [depois de
the João greeted who after of
***ec*$_{i/*k}$** entrar na sala]?
enter in-the room

EP/BP: 'Who did João greet after entering the room?'

b. Quem$_k$ é que o João$_i$ cumprimentou t_k [depois de
who is that the João greeted after of
***ec*$_{i/k}$** entrar na sala]
enter in-the room
EP/BP: 'Who$_i$ did João$_k$ greet after he$_{i/k}$ entered the room?'

From the perspective of the current proposal, this similar behavior is due to the ϕ-defectiveness of T and the optional specification of uF for *wh*-phrases in both languages. The ϕ-defectiveness of T renders the infinitival porous for purposes of A-movement; in turn, the specification of uF or lack thereof determines whether Merge-over-Move will be relevant. If the *wh*-phrase bears uF, Merge-over-Move is inapplicable and the relevant *wh*-phrase must keep moving until it reaches a position where uF can be licensed. This means that although uF licenses sideward movement of *quem* to the matrix object position in a derivational step such as (44) below, it cannot remain there (see (45)) and must move to the matrix [Spec,CP] (see (46)). Again, an *in situ* matrix object cannot control into the adjunct clause (see (43a)), but a *wh*-moved one can (see (43b)).

(44) N = {o$_1$, João$_1$, T$_{[p, n]1}$, cumprimentou$_0$, quem$_0$, depois$_1$, de$_1$, T$_{[n]0}$, entrar$_0$, em$_0$, a$_0$, sala$_0$}
K = [**quem$_{uF}$** entrar na sala]

who enter in-the room

L = [cumprimentou]

greeted

(45) *O João [[cumprimentou **quem$_{uF}$**] [depois de ~~quem$_{uF}$~~

the João greeted who after of

entrar na sala]]

enter in-the room

EP/BP: *'Who$_i$ did João greet after he$_i$ entered the room?'

(46) **Quem$_{\surd uF}$** o João [~~quem$_{uF}$~~ [[cumprimentou ~~quem$_{uF}$~~]

who the João who greeted who

[depois de ~~quem$_{uF}$~~ entrar na sala]]]

after of who enter in-the room

EP/BP: 'Who$_i$ did João greet after he$_i$ entered the room?'

For the sake of completeness, it remains to show how the subject control reading of (36c) in BP and (43b) in BP and EP, repeated below in (47), can be obtained.

(47) a. Quem$_k$ é que o João$_i$ sempre cumprimenta t_k

who is that the João always greets

quando ***ec*$_{i/k}$** entra na sala?

when enters in-the room

BP: 'Who$_i$ does João$_k$ always greets when he$_{i/k}$ enters the room?'

b. Quem$_k$ é que o João$_i$ cumprimentou t_k [depois de
who is that the João greeted after of
***ec*$_{i/k}$** entrar na sala]
enter in-the room

EP/BP: 'Who$_i$ did João$_k$ greet after he$_{i/k}$ entered the room?'

In both cases, the subject control reading results from derivations in which *o João* is generated in the adjunct clause, as sketched in (48) and (49) below. In other words, given that *o João* has no edge feature, Merge-over-Move is enforced and it undergoes sideward movement to the matrix [Spec,vP] only after *quem* is merged in the matrix object position.

(48) N = {o$_0$, João$_0$, T$_{[p, n]1}$, sempre$_1$, cumprimenta$_0$, quem$_1$, quando$_1$, T$_{[n]0}$, entra$_0$, em$_0$, a$_0$, sala$_0$, ...}

K = [[o João] entra na sala]
the João enters in-the room

L = [cumprimenta]
greets

(49) N = {o$_1$, João$_0$, T$_{[p, n]1}$, cumprimentou$_0$, quem$_1$, depois$_1$, de$_1$, T$_{[n]0}$, entrar$_0$, em$_0$, a$_0$, sala$_0$, ...}

K = [[o João] entrar na sala]

the João enter in-the room

L = [cumprimentou]

greeted

The final position of *quem* will then be dependent on whether or not it is associated with uF. If it is, it must end up in the Spec of an interrogative C, yielding sentences such as (47). If it isn't, it stays put, yielding sentences such as (50) (see (36b) and (43a)).

(50) a. [O João]$_i$ sempre cumprimenta quem$_k$

the João always greets who

[quando ***ec*$_{i/*k}$** entra na sala]

when enter in-the room

BP: 'Who$_k$ does João$_i$ always greets when he$_{i/*k}$ enters the room?

b. [O João]$_i$ cumprimentou quem$_k$ [depois de

the João greeted who after of

***ec*$_{i/*k}$** entrar na sala]?

enter in-the room

EP/BP: 'Who did João greet after entering the room?'

Now, what about adjunct control in English? Why can't a sentence such as (51) below (see (18)) allow an object control reading? In particular, if the

ammendent to Bošković's proposal in (33), repeated in (52), is on the right track, one wonders what excludes the simplified derivation sketched in (53).

(51) Who$_k$ did John$_i$ greet t_k [after $ec_{i/*k}$ entering the room]?

(52) a. Portuguese *wh*-phrases: uF is **lexically** optional

b. English *wh*-phrases: uF is optionally **assigned during the computation**

(53) a. K = [$_{vP}$ who entering the room] $\rightarrow_{\text{uF assignment}}$

b. K = [$_{vP}$ **who$_{uF}$** entering the room]

c. K = [$_{vP}$ **who$_{uF}$** entering the room]

L = [greet]

d. K = [$_{vP}$ **who$_{uF}$** entering the room]

M = [greet **who$_{uF}$**]

e. K = [$_{vP}$ **who$_{uF}$** entering the room]

N = [$_{vP}$ John greet **who$_{uF}$**]

f. [$_{CP}$ **Who$_{\surd uF}$** did [$_{TP}$ John [$_{vP}$ [$_{vP}$ ~~John~~ greet ~~who$_{uF}$~~] [after ~~who$_{uF}$~~ entering the room]]]]

After K in (53a) is assembled, uF is assigned to *who* in consonance with (52b). Next, *greet* is selected (see (53c)) and there are two possible ways for it to have its θ-role assigned: via merger of *John* or movement of *who*. Crucially, the presence of uF on *who* in (53b) tips the balance and preempts

Merge-over-Move computations. Thus, *who* may move to the matrix object position (see (53d)) and *John* is then merged as the external argument (see (53e)). Finally, *who* moves to the matrix [Spec,CP] and has its uF licensed (see (53f)). Notice that the derivational route from (53c) to (53f) is the same as the one involved in object control readings in Portuguese. So, why can't (51) have an additional object control reading under the derivation outlined in (53)? Of course, if the assignment of uF in (53a) had not taken place, the derivation should proceed in consonance with Merge-over-Move and the subject control reading would arise. So, another way to ask the question is: how can the assignment of uF in (53a-b) be independently blocked?

My proposal is that the difference between Portuguese and English lies in how uF comes to be associated with *wh*-phrases. In Portuguese, this is a lexical property according to (52a). Hence, once a given *wh*-phrase is borne with uF, it must live with it until this feature is appropriately licensed, which may end up yielding an object control reading in sentences analogous to (51) (see (46)). In English, on the other hand, uF is assigned in the course of the computation, according to (52b). Once this is not a lexical property, uF assignment should be subject to Last Resort, like any other syntactic computation. Bearing this restriction in mind, let us compare the first steps of the unwanted derivation of (53) with the first steps of the derivation of a sentence such as (54) (see (26)), for instance, under the proposed advocated here.

(54) What did John say that Mary bought?

(55) a. [$_{vP}$ Mary v+bought what] →$_{uF\ assignment}$

b. [$_{vP}$ Mary v+bought **what$_{uF}$**]

c. [$_{vP}$ **what$_{uF}$** [$_{v'}$ Mary v+bought ***t***]]

d. [$_{CP}$ that [$_{TP}$ Mary$_k$ [$_{vP}$ **what$_{uF}$** [$_{v'}$ t_k v+bought *t*]]]]

e. [$_{CP}$ **what$_{uF}$** [$_{C'}$ that [$_{TP}$ Mary [$_{vP}$ ***t*** [$_{v'}$ t_k v+bought ***t***]]]]]

f. [$_{vP}$ John v+say [$_{CP}$ **what$_{uF}$** [$_{C'}$ that [$_{TP}$ Mary [$_{vP}$ ***t*** [$_{v'}$ t_k v+bought ***t***]]]]]]

g. [$_{vP}$ **what$_{uF}$** [$_{v'}$ John v+say [$_{CP}$ ***t*** [$_{C'}$ that [$_{TP}$ Mary [$_{vP}$ ***t*** [$_{v'}$ t_k v+bought ***t***]]]]]]]

h. [$_{CP}$ did [$_{TP}$ John$_m$ [$_{vP}$ **what$_{uF}$** [$_{v'}$ t_m v+say [$_{CP}$ ***t*** [$_{C'}$ that [$_{TP}$ Mary [$_{vP}$ ***t*** [$_{v'}$ t_k v+bought ***t***]]]]]]]]]

i. [$_{CP}$ **what$_{\sqrt{uF}}$** [$_{C'}$ did [$_{TP}$ John$_m$ [$_{vP}$ ***t*** [$_{v'}$ t_m v+say [$_{CP}$ ***t*** [$_{C'}$ that [$_{TP}$ Mary [$_{vP}$ ***t*** [$_{v'}$ t_k v+bought ***t***]]]]]]]]]]

If *what* in (55a) does not move to the edge of *v* before the vP phase is completed, it will be spelled out within the complement of *v* and the next phase head (C) will not be able to attract it to its Spec, in consonance with Chomsky's (2001) Phase Impenetrability Condition. Hence, in the derivation of a sentence involving successive cyclic movement of an object such as (54), the lowest *v* must assign uF to the *wh*-element in its domain, as in (55a), so that the object moves to its edge and becomes accessible to next phase head, as seen in (55b). Once endowed with uF, *what* can move to additional phase edges until it has its uF feature licensed (see (55i)). Thus, assignment of uF

to *what* in (55a-b) complies with Last Resort in the sense that is not vacuous. Given the Phase Impenetrability Condition, the *wh*-phrase in (55a) would not be accessible to computations in the next higher phases if it remained in object position.

The derivation of sentences involving successive cyclic movement of a subject is slightly different, though. Take the derivation of (56), sketched in (57), for instance.

(56) Who did John say greeted Mary?

(57) a. $[_{vP}$ who v+greeted Mary$]$

b. $[_{TP}$ **who** $[_{vP}$ ***t*** v+greeted Mary$]]$

c. $[_{CP}$ C $[_{TP}$ who $[_{vP}$ *t* v+greeted Mary$]]]$ $\rightarrow_{\text{uF assignment}}$

d. $[_{CP}$ C $[_{TP}$ **who$_{\text{uF}}$** $[_{vP}$ *t* v+greeted Mary$]]]$

e. $[_{CP}$ **who$_{\text{uF}}$** $[_{C'}$ C $[_{TP}$ ***t*** $[_{vP}$ *t* v+greeted Mary$]]]]$

f. $[_{vP}$ John v+say $[_{CP}$ **who$_{\text{uF}}$** $[_{C'}$ C $[_{TP}$ *t* $[_{vP}$ *t* v+greeted Mary$]]]]]$

g. $[_{vP}$ **who$_{\text{uF}}$** $[_{v'}$ John v+say $[_{CP}$ ***t*** $[_{C'}$ C $[_{TP}$ *t* $[_{vP}$ *t* v+greeted Mary$]]]]]]$

h. $[_{CP}$ did $[_{TP}$ John$_{m}$ $[_{vP}$ **who$_{\text{uF}}$** $[_{v'}$ *t*$_{m}$ v+say $[_{CP}$ *t* $[_{C'}$ C $[_{TP}$ *t* $[_{vP}$ *t* v+greeted Mary$]]]]]]]$

i. $[_{CP}$ **who$_{\surd\text{uF}}$** $[_{C'}$ did $[_{TP}$ John$_{m}$ $[_{vP}$ ***t*** $[_{v'}$ *t*$_{m}$ v+say $[_{CP}$ *t* $[_{C'}$ C $[_{TP}$ *t* $[_{vP}$ *t* v+greeted Mary$]]]]]]]]$

Contrary to *what* in (55a), *who* in (57a) is already available for further computations in other phase domains as it sits in the edge of its phase ([Spec,vP]). Hence, assignment of uF *at this derivational stage* is indeed vacuous and should be blocked by Last Resort. However, the situation changes in (57c), after *who* moves to [Spec,TP]) to check the EPP and a new phase head (C) is introduced in the derivation. If C does not assign uF to *who* before the CP phase is completed, *who* will be trapped in the embedded clause and will not be able to undergo successive cyclic movement later on. Once it is assigned uF, *who* moves from phase edge to phase edge until it reaches the specifier of the interrogative complementizer, where uF is finally licensed (see (57i)),

Given the difference between the derivations of (55) and (57), we are now ready to reexamine the unwanted derivation in (53). In (53a), like what we saw in (57a), *who* is already sitting in a phase edge; hence, assignment of uF, which is resorted to in order to force movement to the edge, is vacuous and should be prevented by Last Resort. Once *who* is not assigned uF in (53a), Merge-over-Move cannot be overridden and the structure in (53f), which should underlie the interpretation of object control into the adjunct, is correctly excluded. A convergent continuation of the derivational step in (58), where *who* is not assigned uF, is sketched in (59), which complies with Merge-over-Move (see (59a)), yielding the familiar case of subject control into the adjunct (see (60)).

(58) $N = \{who_0, entering_0, the_0, room_0, greeted_0, John_1, after_1, ...\}$

K = [$_{vP}$ who entering the room]

L = [greeted]

(59) a. N = {who$_0$, entering$_0$, the$_0$, room$_0$, greeted$_0$, **John$_0$**, after$_1$, ...}

K = [$_{vP}$ who entering the room]

L = [greeted **John**]

b. K = [who^i entering the room]

M = [who^i greeted John]

c. [who^i [$_{vP}$ [$_{vP}$ ~~who^i~~] greeted John] [after ~~who^i~~ entering the room]]

(60) Who greeted John after entering the room?

Finally, for the sake of completeness, the convergent derivation of the sentence (51), repeated here in (61), involves the steps sketched in (62)-(63), which again underlie subject control into the adjunct clause.

(61) Who$_k$ did John$_i$ greet t_k [after $ec_{i/*k}$ entering the room]?

(62) N = {John$_0$, entering$_0$, the$_0$, room$_0$, greet$_0$, who$_1$, after$_1$, ...}

K = [$_{vP}$ John entering the room]

L = [greeted]

(63) a. N = {John$_0$, entering$_0$, the$_0$, room$_0$, greet$_0$, **who$_0$**, after$_1$, ...}

K = [$_{vP}$ John entering the room]

L = [greeted **who**]

b. K = [John^{i} entering the room]

M = [John^{i} greet who]

To recap. *Wh-in situ* differs in English and Portuguese (see (34) *vs.* (35)) in a way that cannot be captured by simply saying that uF is optional in these languages, as in Bošković's (2007) system. I proposed that the relevant difference bears on the nature of the optionality of uF in each language. In Portuguese, uF is lexically optional, whereas in English it is optionally assigned in the course of the computation. This difference has consequences as to how uF is treated in each language. In Portuguese, there is no way out. Once uF is present in a given *wh*-phrase, the *wh*-phrase must move to an edge position. In English, assignment of uF during the computation will only take place if it is not vacuous, in consonance with Last Resort. Specifically, it won't take place if the relevant *wh*-phrase is already in a phase edge. The empirical consequence of this difference is that languages like Portuguese have more readings in adjunct control configurations than English because it rules in derivations that are excluded by Merge-over-Move computations in English.[16]

4. Further extensions: Null possessors in Portuguese

[16] This proposal also has interesting consequences for Nunes's (1995, 2001, 2004) analysis of parasitic gaps in terms of sideward movement. Due to space limitations, I will however leave exploration of this issue for another occasion.

BP and EP also differ with respect to null possessors in a way that parallels their contrast with respect to null subjects. Thus, although both languages admit a null possessor construction such as (64), the interpretation they assign to the null possessor is substantially different. As argued by Floripi (2003), Rodrigues (2004), and Floripi and Nunes (2009), null possessors behave like *pro*s in EP, but like A-traces in BP. Hence, although the null possessor in (64) may but need not be interpreted as the matrix subject in EP, this is the only possibility in BP.

(64) O João$_i$ conversou com [o pai ***ec***]
the João talked with the father
EP: 'João$_i$ talked with his$_{i/j}$/her father.'
BP: 'João$_i$ talked with his$_{i/*j}$/*her father.'

This difference between BP and EP becomes clear with a sentence such as (65) below, which in EP has the pragmatically salient reading that Maria is going to marry John's father, whereas in BP it means that Maria is going to marry her own father. This incestuous reading is due to the fact that being an A-trace, the null possessor in BP must be bound by the closest c-commanding antecedent, which in the case of (65) is the embedded subject *Maria*.

(65) O João disse que a Maria vai casar com [o pai ***ec***]

the João said that the Maria goes marry with the father

EP: 'João said that Maria is going to marry his father.'

BP: 'João said that Maria is going to marry her own father.'

Given this independent difference between BP and EP, the analysis outlined in section 3 makes the prediction that *wh*-movement should interfere with the interpretation of null possessors in BP, but not in in EP. This prediction is borne out. Consider the data in (66), for example.

(66) a. A Maria$_i$ esbofeteou o Pedro$_k$ por causa d[o irmão ***ec***]

the Maria slapped the Pedro by cause of-the brother

EP: 'Maria slapped Pedro because of her/his brother.'

BP: 'Maria slapped Pedro because of her/*his brother.'

b. A Maria$_i$ esbofeteou quem$_k$ por causa d[o irmão ***ec***]?

the Maria slapped who by cause of-the brother

EP: 'Who did Maria slap because of his/her brother?'

BP: 'Who$_k$ did Maria$_i$ slap because of her$_i$/*his$_k$ brother?'

c. Quem$_k$ é que a Maria$_i$ esbofeteou t_k por causa d[o irmão ***ec***]?

who is that the Maria slapped by cause of-the brother

EP: 'Who did Maria slap because of his/her brother?'

BP: 'Who$_k$ did Maria$_i$ slap because of **her$_i$/his$_k$** brother?'

In (66), the interpretation of the null possessor remains constant in EP regardless of the syntactic position occupied by the subject and the object.

This is expected if EP's null possessors are *pro*s. In BP, on the other hand, the null possessor must take the subject as its antecedent, unless the object undergoes *wh*-movement, in which case the object can also be interpreted as a proper antecedent for the null possessor. The pattern displayed by BP replicates what we saw in adjunc control configurations and it is thus no surprise that the null possessor in (66) is located within an adjunct. Applying the analysis of adjunct control developed in section 3 to these constructions in BP, we have two consider two scenarios: whether or not the *wh*-phrase is lexically specified for uF.

Suppose, for instance, that the computational system has reached the step in (67a) below and *quem* is not specified for uF. Merge-over-Move will then ensure that *esbofetear* has its internal θ-role assigned via merger of *a Maria*, as shown in (67b), prior to sideward movement of *quem* to the matrix [Spec,vP] (see (67c)). Further computations then yield the structure in (67d), which surfaces as (67e) with a subject control reading where the null possessor takes *quem* as its antecedent.

(67) a. K = [o irmão **quem**]

L = esbofeteou

b. K = [o irmão **quem**]

M = [esbofeteou [a Maria]]

c. K = [o irmão $\boldsymbol{t_i}$]

M = [**quem**$_i$ esbofeteou [a Maria]]

d. [$_{TP}$ **Quem$_i$** [$_{vP}$ [$_{vP}$ ***t$_i$*** esbofeteou [a Maria]] [por causa do irmão ***t$_i$***]]]

e. Quem esbofeteou a Maria por causa do irmão
who slapped the Maria by cause of-the brother
'Who$_i$ slapped Maria because of his$_i$ brother?'

Suppose now that in a derivational step analogous to (67a), *quem* has uF, as represented in (68a) below. In this case, Merge-over-Move is inapplicable and *quem* moves to the object position (see (68b)) and *a Maria* is merged as the external argument (see (68c)). Crucially, once *quem* has uF, it cannot stay in object position for this feature won't be licensed in this position. In other words, (68b) cannot support an object reading in BP, for the object contains an unlicensed feature, as represented in (69). By contrast, if *quem* moves to [Spec,CP], as represented in (70), uF is licensed and the derivation converges; hence, the sentence in (66c) does admit an object control reading in BP.

(68) a. K = [o irmão **quem$_{uF}$**]
L = esbofeteou

b. K = [o irmão ***t***]
M = [esbofeteou **quem$_{uF}$**]

c. K = [o irmão ***t***]
M = [[a Maria] esbofeteou **quem$_{uF}$**]

(69) *[$_{TP}$ [a Maria]$_k$ [$_{vP}$ [$_{vP}$ t_k esbofeteou **quem$_{uF}$**]
the Maria slapped who
[por causa do irmão ***t***]]]
by cause of-the brother

(70) [$_{CP}$ **quem$_{\sqrt{uF}}$** [$_{TP}$ [a Maria]$_k$ [$_{vP}$ [$_{vP}$ t_k esbofeteou ***t***]
who the Maria slapped
[por causa do irmão ***t***]]]]
by cause of-the brother

In sum, to the extent that the relevance of overt *wh*-movement for the interpretation of new possessors in BP can be accounted for without any provisos, it provides strong support for the analysis proposed in section 3.

5. Concluding Remarks

Adjunct control is of special interest in the current vigorous debate on how control is to be accounted for within Minimalism. As argued by Hornstein (1999, 2001),[17] it is a great virtue of the MTC that it is able to provide a unified analysis to both complement and adjunct control. Once movement is broken in more basic derivations such as Copy and Merge, sideward move-

[17] See also Boeckx, Hornstein, and Nunes 2010 and Hornstein and Nunes 2014.

ment becomes a possibility in the system[18] and provides a crucial tool in the movement analysis of adjunct control. From this perspective, the movement analysis of adjunct control provides strong empirical support to the minimalist proposal that Move is not a primitive of the system. Furthermore, the subject-object asymmetry found in adjunct control also goes in the same direction by showing that all things being equal, merger is to be chosen over the more complex movement operation.

In this paper I have focused on cases when things are not always equal and economy considerations in terms of Merge-over-Move are not applicable. My proposal is that the way how edge features that trigger overt movement to a phase edge are encoded in different languages has a great impact on Merge-over-Move computations. In the particular case of adjunct control, the way how the optionality of edge features is encoded in the system may end up obliterating the usual subject-object asymmetry in the choice of the controller and allow for restricted instances of object control into adjuncts. Thus, on the empirical side, the present paper has brought to light new data that should be taken into account by any adequate theory of control – be it minimalist or not. On the theoretical side, the discussion in the previous sections offers a novel kind of evidence to the MTC. After all, isn't it nice to see that (adjunct) control may be affected by the *movement* properties of a given language?

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[18] See Nunes 1995, 2001, 2004, 2012 and Hornstein 2001 for detailed discussion.

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