

Preposition Insertion in the Mapping from Spell-Out to PF^{*}

Jairo Nunes

Universidade de São Paulo

This paper discusses three case studies on the realization of spurious prepositions and argues that they illustrate a general interaction of convergence requirements of the morphological component with an economy condition that enforces faithfulness between the lexical items present in the numeration and the lexical items present in the PF output.

Keywords: dummy prepositions, inherent Case, syntax-phonology mapping, economy, Parallelism Requirement

1 Introduction

This paper reviews three case studies of syntax-PF mismatches with respect to preposition realization. The first case involves the well-known contrast in English illustrated in (1), where perception and causative verbs appear to select for bare infinitivals in their active form, but for *to*-infinitivals in their passive form.

- (1) a. I saw Mary (***to**) leave
b. Mary was seen ***(to)** leave

The second case of mismatch to be discussed below is illustrated by sentences such as (2) in Brazilian Portuguese (henceforth *BP*), where the

* The research on the material discussed here has received support from CNPq (401148/2006–8) and FAPESP (grant # 2006/00965–2). For helpful comments and suggestions, I would like to thank Mary Kato, Ralf Vogel, the audience at DEAL II (Descriptive and Explanatory Adequacy in Linguistics: Interface Theories - The Filtering of the Output of the Generator), and especially Hans Broekhuis.

complement of a verb like *precisar* ‘need’ requires a preposition only if it surfaces *in situ*.

- (2) a. Você precisa ***(de)** quantos livros?
 you need of how-many books
 ‘How many books do you need?’
- b. **(De)** quantos livros você precisa?
 of how-many books you need
 ‘How many books do you need?’

Finally, the third case involves contrasts such as (3) in BP, where the second conjunct of an embedded coordinated subject must surface as a PP if the preposition selecting the infinitival clauses fuses with the first conjunct.

- (3) a. Eu fiquei contente **por a** Maria e **(*por) o** João ganharem
 I was happy by the Maria and by the João win-INF-3PL
 o prêmio
 the prize
 ‘I was happy because João and Maria won the prize.’
- b. Eu fiquei contente **pela** Maria e ***(pel)o** João ganharem
 I was happy by-the Maria and by-the João win-INF-3PL
 o prêmio
 the prize
 ‘I was happy because João and Maria won the prize.’

Assuming the general framework of the Minimalist Program (Chomsky 1995, 2000, 2001), I will show that the contrasts illustrated in (1)–(3) follow from the interaction between convergence requirements and a general economy condition on the mapping from the numeration to PF.

2 P-insertion

The contrast in (4) below is an old riddle of Modern English grammar (see among others Williams 1983, Zagona 1988, Lightfoot 1991, Felser 1998, Hornstein, Martins, and Nunes 2006, 2008, and references therein). At first

sight, it seems that perception and causative verbs select different types of infinitival complements depending on whether or not they are active or passive.

- (4) a. John saw/heard/made them **(*to)** hit Fred
 b. There were seen/heard/made ***(to)** hit Fred

Although this is the general line of thought that has been pursued in different forms in the literature, Hornstein, Martins, and Nunes (2006, 2008) (*HMN* hereafter) have recently outlined an alternative approach that keeps selection and syntactic computations constant for active and passive pairs and attributes their differences to computations in the phonological component, after the relevant structures are spelled out.

Their starting point is Nunes's (1995) extension of Raposo's (1987) proposal regarding the Case properties of Portuguese infinitivals to English. Raposo argued that infinitives in Portuguese are nominal projections and as such, they must be Case marked. In (5), for instance, the dummy preposition *de* is required when the infinitival is the complement of heads that do not assign Case, such as the noun *receio* 'fear' in (5b) or the adjective *receoso* 'fearful' in (5c), but not if the subcategorizing head is a Case assigner such as the verb *recear* 'to fear' in (5a).

- (5) a. O rapaz receia **(*de)** [chumbar o exame]
 the boy fears of fail-INF the exam
 'The boy fears failing the exam.'
- b. o receio ***(de)** [chumbar o exame]
 the fear of fail-INF the exam
 'the fear of failing the exam'
- c. O rapaz está receoso ***(de)** [chumbar o exame]
 the boy is fearful of fail-INF the exam
 'The boy is fearful of failing the exam.'

Nunes (1995) observed that Old English infinitivals could be described along similar lines, for they function like nominal projections (see Lightfoot 1979) and their overt infinitival morpheme *-an* may show inflection for dative Case, surfacing as *-anne* or *-enne*, when preceded by the preposition *to* (see Callaway 1913). Based on this fact, Nunes (1995) proposes that the infinitival morpheme became null in Modern English but retained its nominal property of requiring Case assignment. Under this view, *to* in (4) is taken to behave like *de* in (5) in being a last resort strategy for Case-marking the infinitival in the absence of a (local) Case-assigner.

HMN reinterpret Nunes's (1995) suggestion within Chomsky's (2001) Agree-based framework, according to which (i) Case-valuation is a reflex of ϕ -agreement between a ϕ -complete probe and a goal DP; and (ii) finite Ts and "transitive" light verbs, which are assumed to bear person and number features, count as ϕ -complete, but participial heads, which are assumed to bear gender and number features, do not. More specifically, HMN propose that the T head of the infinitival complement of perception and causative verbs in English has unvalued number and Case-features (see HMN 2006, 2008 for motivation and discussion), regardless of whether the subcategorizing verb is active or passive. The derivation of an active sentence such as (6), for instance, proceeds along the lines of (7).

(6) I saw Mary leave

- (7) a. [TP T_{[N:u]/[Case:u]/EPP} [VP Mary_{[P:3]/[G:FEM]/[N:SG]/[Case:u]} leave]]
 b. [TP T_{[N:SG]/[Case:u]/EPP} [VP Mary_{[P:3]/[G:FEM]/[N:SG]/[Case:u]} leave]]
 c. [VP V_{[P:u]/[N:u]} saw [TP Mary_{[P:3]/[G:FEM]/[N:SG]/[Case:u]} [T' T_{[N:SG]/[Case:u]/EPP} [VP *t* leave]]]]
 d. [VP V_{[P:u]/[N:u]} saw [TP Mary_{[P:3]/[G:FEM]/[N:SG]/[Case:u]} [T' T_{[N:SG]/[Case:ACC]/EPP} [VP *t* leave]]]]

- e. $[_{VP} V_{[P:3]/[N:SG]} \text{ saw } [_{TP} \text{ Mary}_{[P:3]/[G:FEM]/[N:SG]/[Case:ACC]} [_{T'} T_{[N:SG]/[Case:ACC]/\cancel{EPP}} [_{VP} t \text{ leave }]]]]$

In (7a), the head of the infinitival head agrees with *Mary* and has its own number feature valued, as shown in (7b). However, the Case-features of both T and *Mary* remain unaltered, because T does not have a complete ϕ -set (see Chomsky 2000, 2001). After *Mary* moves to [Spec,TP] to check the EPP and the matrix light verb is introduced, we obtain the structure in (7c). *Mary* and T in (7c) are equidistant from the matrix light verb (see Chomsky 1995), as *Mary* is in the minimal domain of the infinitival T. Hence, the matrix light verb can agree with the infinitival T, yielding (7d), and then with *Mary*, yielding (7e), which surfaces as (6) after further computations. Crucially, the matrix light verb remains active after valuing the Case-feature of the infinitival T in (7d), because the ϕ -set of T is incomplete and does not match all the features of the matrix light verb (see Chomsky 2001:15).

In turn, the derivation of a passive sentence such as (8) involves the steps represented in (9).

(8) *Mary* was seen **to** leave

- (9) a. $[_{TP} T_{[N:u]/[Case:u]/EPP} [_{VP} \text{ Mary}_{[P:3]/[G:FEM]/[N:SG]/[Case:u]} \text{ leave}]]]$
 b. $[_{TP} T_{[N:SG]/[Case:u]/EPP} [_{VP} \text{ Mary}_{[P:3]/[G:FEM]/[N:SG]/[Case:u]} \text{ leave}]]]$
 c. $[_{PartP} \text{-en}_{[G:u]/[N:u]/[Case:u]} [_{VP} \text{ see } [_{TP} \text{ Mary}_{[P:3]/[G:FEM]/[N:SG]/[Case:u]} [_{T'} T_{[N:SG]/[Case:u]/\cancel{EPP}} [_{VP} t \text{ leave}]]]]]]]$
 d. $[_{PartP} \text{-en}_{[G:FEM]/[N:SG]/[Case:u]} [_{VP} \text{ see } [_{TP} \text{ Mary}_{[P:3]/[G:FEM]/[N:SG]/[Case:u]} [_{T'} T_{[N:SG]/[Case:u]/\cancel{EPP}} [_{VP} t \text{ leave}]]]]]]]$
 e. $[_{TP} T_{[P:u]/[N:u]/EPP} [_{VP} \text{ be } [_{PartP} \text{-en}_{[G:FEM]/[N:SG]/[Case:u]} [_{VP} \text{ see } [_{TP} \text{ Mary}_{[P:3]/[G:FEM]/[N:SG]/[Case:u]} [_{T'} T_{[N:SG]/[Case:u]/\cancel{EPP}} [_{VP} t \text{ leave}]]]]]]]]]]]$

The steps in (9a) and (9b) are no different from the ones in (7a) and (7b). The situation changes when the step in (9c) is reached. The participial head

associated with passives is ϕ -incomplete in not having a person feature. Hence, although agreement between *-en* and *Mary* in (9c) can take place, as shown in (9d), all the Case features remain unvalued. The final relevant step is shown in (9e), after the ϕ -complete matrix T enters the derivation. The finite T can agree with *Mary* skipping the participial head, for the latter does not match all the ϕ -features of *Mary* (it does not have a person feature). However, *-en* blocks agreement between the matrix and the infinitival T as it matches all the ϕ -features of the infinitival T, namely, its only number feature. The derivation as it stands in (9e) is bound to crash because the infinitival T does not have its Case feature valued.

An important feature of this analysis, as mentioned above, is that the computations of the syntactic component before Spell-Out are the same for both active and passive constructions. It is not the case for instance that they have different selection requirements or that in the case of passives, the infinitival complement first merges with a preposition and then the resulting object merges with the relevant passive verb. The different results between actives and passives with respect to convergence follow from independent minimality computations: long distance agreement between a Case-valuing light verb and the infinitival head in the active versions (cf. (7d–e)) complies with minimality, whereas long distance agreement between a Case-valuing T and the infinitival head in the passive versions (cf. (9e)) violates minimality due to the intervention of the participial head.

By keeping the operations of the syntactic component constant, we have an account for why a sentence such as (8) without *to* is ruled out. Moreover, if *to* is not part of the structure assembled by the syntactic component, we are led to the conclusion that it should be inserted in the phonological component after Spell-Out, given the licit PF output in (8). However, this conclusion brings with

it two questions. First, we have to explain how insertion of *to* in the phonological component can prevent a structure such as (9e) in English from crashing at LF. After all, the Case-feature of the infinitival head in (9e) was not appropriately licensed in the syntactic component and this structure will feed LF.

The second question, related to the first one, has to do with overgeneration. If *to* can Case-license the infinitival head for both PF and LF reasons, why can't it surface in active sentences, as seen in (4a)? Even more puzzling, how can a sentence such as (10a) with the structure in (10b) be filtered out?

(10) a. * It was seen **to** Mary leave

b. [TP *it* T_{[P:3]/[N:SG]/~~PPP~~} [VP *be* [PartP-*en*_{[G:FEM]/[N:SG]/[Case:NOM]} [VP *see*
[TP *Mary*_{[P:3]/[G:FEM]/[N:SG]/[Case:u]} [T' T_{[N:SG]/[Case:u]/~~PPP~~} [VP *t* leave]]]]]]]

In (10b), the matrix T has valued the Case feature of the participial head, before having its own ϕ -set valued by the expletive and becoming inactive for further agreement relations. Thus, *Mary* and the infinitival head in (10b) remain Caseless. However, given that *to* can rescue the derivation sketched in (9) (cf. (8)) by Case-licensing the infinitival head, it should in principle be able to Case-license *Mary*, as well. Crucially, *Mary* and the infinitival head are equidistant, as discussed earlier. To put it in general terms, why is *to*-insertion so restricted that it gives the impression that the passive versions of perception and causative verbs have different selectional requirements from their active counterparts?

HMN propose that *to* in (8) is actually the morphological reflex of the inherent Case assigned by the matrix V to its infinitival complement. In other words, if inherent Case is assigned during the course of the syntactic computation, the infinitival head has its Case licensed also for LF purposes, thus answering our first question above. Moreover, under the standard assumption

that inherent Case must be associated with θ -role assignment (see Chomsky 1986), the unacceptability of (10a) is also explained. Regardless of the fact that *Mary* and the infinitival head are equidistant, only the infinitival head is θ -marked by *see*; hence, *Mary* in (10a) cannot be Case-licensed by the matrix verb in (10b) and the derivation crashes.¹ As for the ungrammaticality of the active sentence in (4a) with *to*, HMN propose that the realization of inherent Case by means of a preposition is subject to Last Resort: it will be employed only when it must. If the derivation in (7), for instance, can converge without “*to*-insertion” (cf. (6)), *to*-insertion is blocked.

If *to* in (8) is indeed not part of the structure shipped to the phonological component by Spell-Out, we are led to the conclusion that the phonetic realization of spelled out structures is subject to a general economy condition requiring that the lexical items present in the PF output match the ones present in the underlying numeration. That is, insertion of (semantically vacuous) material in the morphological component is only allowed if needed for convergence. When no specific convergence requirement is at issue, as is the case of (7e)/(6), for instance, this faithfulness condition blocks insertion of *to*.²

This reasoning extends to cases such as (11) and (12) in English and (13) in Serbo-Croatian, also discussed by HMN under this perspective.

¹ This reasoning also provides an account for the ungrammaticality of (i) below, pointed out by Hans Broekhuis (p.c.). Given that inherent Case is associated with specific θ -roles, the ungrammaticality of (i) follows if the θ -role assigned by the verb *see* to an infinitival clause is different from the θ -role assigned to a DP. In other words, if *to* realizes the inherent Case assigned to the infinitival clause, as assumed here, it cannot be associated with a DP, as in (i).

(i) * It was seen to Mary

² The existence of multiple copy constructions (in violation of this general faithfulness condition) may be compatible with the view advocated by HMN if the realization of multiple copies is triggered by convergence requirements of the morphological component, as proposed by Nunes (1999, 2004) (see also the collection of papers in Corver and Nunes 2007 for relevant discussion).

(11) a. * John **does** love Mary [unstressed *do*]

b. John loves Mary

(12) a. * [[the city]_i’s [destruction **of** *t_i*]]

b. [[the city]_i’s [destruction *t_i*]]

(13) a. On je ovladao (***sa**) zemljom
he is conquered with country-INSTR.SG
‘He conquered that country.’

b. On je ovladao ***(sa)** pet zemalja
he is conquered with five country-GEN.PL
‘He conquered five countries.’

Given that the derivations underlying (11a) can converge without *do*-support (cf. (11b)), (11a) is filtered out by the faithfulness condition under the assumption that dummy *do* is not part of the numeration (see Arnold 1995). Similar considerations apply to (12): *the city* is Case-licensed in both (12a) and (12b), but only (12b) satisfies the faithfulness condition; hence, (12a) is ruled out. As for (13), Bošković (2006) shows that when instrument Case morphology can be realized by an NP in Serbo-Croatian, insertion of the preposition *sa* ‘with’ is prevented (cf. (13a)). By contrast, given that “higher numerals” like *pet* ‘five’ in Serbo-Croatian do not decline, the realization of inherent instrumental Case in (13b) is only possible if the preposition is inserted (see Bošković 2006 for additional data and discussion). The contrast in (13) thus indicates that *sa* in these constructions is not present in the numeration and its realization in violation of the faithfulness condition yields a grammatical output only when convergence requirements on Case realization in the morphological component demand it.

To sum up, in this section we discussed instances of P-insertion in the mapping from Spell-Out to PF and showed that they can be analyzed as following from the interaction between convergence requirements and a general

economy condition demanding that the lexical items present at PF match the ones present in the numeration that feeds the derivation. In the next section, we discuss cases where this interaction results in apparent P-deletion, instead.

3 Apparent P-deletion

Consider the BP data in (14)–(17) below.

- (14) a. O João gosta ***(d)a** Maria
 the João likes of-the Maria
 ‘João likes Maria’
- b. * O João riu ***(d)a** Maria
 the João laughed of-the Maria
 ‘João laughed Maria’
- (15) a. * Quem que o João gosta **de**?
 quem that the João like of
 ‘Who does João like?’
- b. * Quem que o João riu **de**?
 quem that the João laughed of
 ‘Who did João laugh at?’
- (16) a. **(De)** quem que o João gosta?
 of who that the João likes
 ‘Who does João like?’
- b. O João gosta ***(de)** quem?
 the João likes of who
 ‘Who does João like?’
- (17) a. ***(De)** quem que o João riu?
 of who that the João laughed
 ‘Who did João laugh at?’
- b. O João riu ***(de)** quem?
 the João laughed of who
 ‘Who did João laugh at?’

(14) shows that the verbs *gostar* ‘like’ and *rir* ‘laugh’ in BP subcategorize for a PP headed by the preposition *de* ‘of’. (15) further shows that BP does not generally allow P-stranding (see Salles 1997). Interestingly, (16) shows that the preposition may be dropped if the *wh*-phrase appears in the left periphery (see Kato 2008). However, this cannot be a general process, for in (17) the preposition must be present regardless of the position of the *wh*-constituent.³

Discussing data parallel to (14)–(17) in the domain of relative clauses and left dislocation structures in BP, Kato and Nunes (2008) argue that it is not the case that the preposition in (16a) is optional or can be deleted. Rather, each possibility is taken to correspond to a different derivational path: the version with the preposition involves movement and the version without the preposition involves base generation of the *wh*-phrase and resumption, as illustrated in (18) below. These two possibilities correlate, as we should expect, with island effects, with only the version with the preposition displaying island sensitivity, as shown in (19).

³ Contrasts such as the one in (14)–(17) are not restricted to the preposition *de* ‘of’ in BP, as illustrated in (i)–(ii), with the preposition *com* ‘with’ (see Kato and Nunes 2008 for relevant discussion).

- (i) a. O João conversou ***(com)** a Maria ontem
 the João talked with the Maria yesterday
 ‘João talked with Maria yesterday.’
 b. O João competiu ***(com)** a Maria ontem
 the João competed with the Maria yesterday
 ‘João competed with Maria yesterday.’
- (ii) a. **(Com)** quem que o João conversou ontem?
 with who that the João talked yesterday
 ‘Who did João talk to yesterday?’
 b. ***(Com)** quem que o João competiu ontem?
 with who that the João competed yesterday
 ‘Who did João compete with yesterday?’

- (18) a. [[de quem]_i que o João gosta *t_i*]?
of who that the João likes
‘Who does João like?’
- b. [quem_i que o João gosta *pro_i*]?
who that the João likes
‘Who does João like?’
- (19) a. * [[de que autor]_i que você não encontrou uma só pessoa [que
of which author that you not found one only person that
gostasse *t_i*]]?
liked
‘Which author was such that you didn’t find a single person who
liked him?’
- b. [[que autor]_i que você não encontrou uma só pessoa [que
which author that you not found one only person that
gostasse *pro_i*]]?
liked
‘Which author was such that you didn’t find a single person who
liked him?’

What about the contrast between (16a) and (17a)? What is responsible for blocking the P-less versions of (17a) under a derivation employing base-generation and resumption, as in (18b) and (19b)? Kato and Nunes’s (2008) account for this contrasts involves two ingredients. First, assuming that it is a lexical idiosyncrasy that some verbs but not others assign inherent Case, they propose that prepositions that can be omitted in BP are markers of inherent Case. This means that *gostar* ‘to like’ in (14a)/(16) assigns inherent Case, but *rir* ‘to laugh’ in (14b)/(17) does not. Independent evidence for their proposal is the fact that *gostar* licenses an inherently Case marked reflexive clitic, but *rir* does not, as shown in (20).

- (20) a. Eles **se** gostam muito
they REFL.CL.3PL like much
‘They like each other a lot.’

- b. * Eles **se** riram bastante
 they REFL.CL.3PL laughed much
 ‘They laughed a lot at each other.’

The second ingredient of their analysis relies on the general availability of null pronominal objects in BP (see among others Galves 1989, Farrell 1990, Kato 1993, Cyrino 1997, and Ferreira 2000). Kato and Nunes (2008) propose that a null pronoun can be licensed by an inherent Case assigning verb such as *gostar* (cf. (18b) and (19b)). Thus, the unacceptability of the P-less version of (17a) under a derivation involving base-generation and resumption, sketched in (21) below, is due to the lack of structural or inherent Case-licensing for *pro*. Crucially, although *pro* can be licensed by inherent Case, *rir* is not an inherent Case assigner (cf. (20b)).

- (21) * [quem_i que o João riu *pro*_i]?
 who that the João laughed
 ‘Who did João laugh at?’

Questions then arise with respect to the unacceptability of (15a) and (15b), under the derivation involving base-generation and resumption, as sketched in (22).

- (22) a. * [quem_i que o João gosta **de** *pro*_i]?
 who that the João likes of
 ‘Who does João like?’
 b. * [quem_i que o João riu **de** *pro*_i]?
 who that the João laughed of
 ‘Who did John laugh at.’

There are two potential explanations for the ungrammaticality of (22): (i) *pro* is like traces (cf. (15)) in also being incompatible with a stranded preposition; or (ii) the realization of inherent Case in the phonological component is subject to the interaction between convergence and faithfulness

considerations, as discussed in section 2. Data such as (23) allow us to tease these two possibilities apart.

- (23) a. O professor distribuiu [o material]_i, mas eu fiquei **sem** *pro*_i
 the teacher distributed the material but I remained without
 ‘The teacher handed out the material, but I didn’t get it.’
- b. Que cópia que [os alunos que ficaram **sem** *pro*_i]
 which copy that the students that remained without
 reclamaram?
 complained
 ‘Which copy was it that the students who didn’t get it complained?’

(23a) shows that the proposition *sem* ‘without’ in BP is exceptional in allowing a null complement. In turn, (23b) further shows that this null complement may appear within islands (in this case a relative clause within a subject), which indicates that we are dealing with *pro* rather than a trace. Thus, the acceptability of the sentences in (23) shows that the ungrammaticality of (22a) and (22b) does not have to do with stranding, but with Case realization.

To wrap up. The contrast between (16a) and (17a) also follows from the interaction between convergence requirements and the faithfulness condition matching the lexical items present in the PF output and the underlying numeration. That is, assuming that the Case Filter ultimately requires that overt nominal expressions realize Case, the faithfulness condition will always be violated in constructions such as (16b) and (17b), for a preposition that is not present in the numeration must be inserted to realize the inherent Case assigned by the verb. However, if the argument of the verb is null, the faithfulness condition becomes relevant and insertion of the preposition is blocked (cf. (22)). Constructions such as (21), on the other hand, have no salvation, for the particular verb chosen does not assign inherent Case and the derivation crashes because *pro* is not Case-licensed.

4 P-duplication

Let us finally consider syntax-phonology mismatches involving P-duplication. Take the BP data in (24) and (25), for instance.

- (24) a. * Eu pensei **em o** João [*formal/colloquial BP*]
 I thought in the João
 ‘I thought about João.’
- b. Eu pensei **no** João [*formal/colloquial BP*]
 I thought in-the João
 ‘I thought about João.’
- (25) a. Eu pensei **em o** João fazer esse trabalho [formal BP]
 I thought in the João do-INF this job
 ‘I think that João should do this job.’
- b. Eu pensei **no** João fazer esse trabalho [colloquial BP]
 I thought in-the João do-INF this job
 ‘I think that João should do this job.’

(24) shows that in BP the preposition *em* ‘in’ and the definite article *o* ‘the’ must contract when they are adjacent. In turn, (25) shows that if the definite article belongs to the embedded subject, lack of contraction is possible in formal registers of BP, although contraction is the form chosen in colloquial BP. Nunes and Ximenes (2008) analyze the difference between (25a) and (25b) as arising from two different structures. In formal registers of BP, the Case-marking preposition *em* precedes the whole infinitival CP, as shown in (26) below, and in this circumstance it is not adjacent to the determiner due to the intervention of C; lack of adjacency then yields lack of contraction (cf. (25a)). As for colloquial BP, Nunes and Ximenes argue that the preposition is realized as C, which renders it adjacent to the determiner, as sketched in (27), and contraction is obligatory (cf. (25b)).

- (26) [... X [**P** [_{infinitival-CP} C [TP [DP **D** ...]]]]]

(27) [... X [_{infinitival-CP} **P/C** [_{TP} [_{DP} **D** ...]]]]

A very puzzling paradigm arises in colloquial BP when the contraction patterns depicted in (24)–(25) are combined with coordination, as illustrated in (28) and (29) (see Ximenes 2002, 2004, Ximenes and Nunes 2004, and Nunes and Ximenes 2008).

(28) a. * Eu pensei **no** João e **a** Maria [*formal/colloquial BP*]
 I thought in-the João and the Maria
 ‘I thought about João and Maria.’

b. Eu pensei **no** João e **na** Maria [*formal/colloquial BP*]
 I thought in-the João and in-the Maria
 ‘I thought about João.’

(29) a. * Eu pensei **em o** João e **em a** Maria [*formal/colloquial BP*]
 I thought in the João and in the Maria
 fazerem esse trabalho
 do-INF.3PL this job
 ‘I think that João and Maria should do this job.’

b. Eu pensei **no** João e **na** Maria [*colloquial BP*]
 I thought in-the João and **in-the** Maria
 fazerem esse trabalho
 do-INF.3PL this job
 ‘I think that João and Maria should do this job.’

(28) shows that contracting prepositions must be repeated if one of the conjuncts has a determiner that triggers contraction. This suggests that the Parallelism Requirement on coordinated structures (see e.g. Chomsky 1995, Fox 2000) also applies to the morphological component. That is, once contraction appears in one conjunct, it must appear in every conjunct. Thus, at first sight, (28) can converge only if there are two prepositions in the underlying numeration and the PPs headed by these preposition are accordingly coordinated, as sketched in (30).

(30) [Eupensei [[_{PP} **no** João] e [_{PP} **na** Maria]]]

I thought in-the João and in-the Maria

However, this account cannot be extended to (29). That the presence of the uncontracted preposition in (29a) leads to ungrammaticality is not mysterious, for the embedded subject must involve coordination of DPs and not of PPs. For instance, the coordinated subject functions as the agent of the embedded verb and triggers plural agreement on the inflected infinitival. If PP coordination is not a convergent option for (29a), the question then is why the sentence becomes acceptable if the prepositions get contracted with the relevant determiners (cf. (29b)).

Nunes and Ximenes 2008 (see also Ximenes 2002, 2004 and Ximenes and Nunes 2004 for discussion) argue that (29b) indeed involves coordination of DPs, as expected, and that the second preposition is inserted in the morphological component. More specifically, they propose that if we have morphological merger (see Halle and Marantz 1993) in the boundary of one conjunct, the Parallelism Requirement requires morphological merger in all conjuncts. The derivation of (29b), for instance, proceeds along the lines of (31).

(31)a. *Spell-Out:*

[... pensei [_{CP} **em** [_{TP} [_{andP} [_{DP} **o** João] [_{and'} e [_{DP} **a** Maria]]] fazerem...]]]

b. *Morphological merger:*

[... pensei [_{CP} [_{TP} [_{andP} [_{DP} **em+o** João] [_{and'} e [_{DP} **a** Maria]]] fazerem...]]]

c. *Copy and morphological merger:*

[... pensei [_{CP} [_{TP} [_{andP} [_{DP} **emⁱ+o** João] [_{and'} e [_{DP} **emⁱ+a** Maria]]] fazerem...]]]

d. *Fusion:*

[... pensei [_{CP} [_{TP} [_{andP} [_{DP} **no** João] [_{and'} e [_{DP} **na** Maria]]] fazerem...]]]

Given that in colloquial BP, Case-marking prepositions are realized in C when they take infinitival complements (cf. (27)), the preposition *em* in (31a) is adjacent to the first determiner of the coordinated embedded subject in the spelled out structure and morphological merger is obligatory in these circumstances, as seen in (31b). Once morphological merger affects the boundary of the coordinated subject, the Parallelism Requirement on coordinated structures kicks in and demands that the second conjunct also undergo morphological merger. Given that there is no preposition adjacent to the determiner of the second conjunct (recall that the embedded subject involves DP- and not PP-coordination), the preposition morphologically merged with the first conjunct is then copied and the resulting copy merges with the determiner of the second conjunct, as shown in (31c).⁴ Finally, the prepositions and the determiners fuse, as shown in (31d), yielding the PF output in (29b), which at first glance appears to involve a quite exotic case of PP-coordination.⁵

⁴ Such copying can be seen as a subtype of the standard operation involved in morphological reduplication.

⁵ This means that the sentence in (28b) may result from a derivation with two instances of the preposition *em* in the numeration and PP coordination in the syntactic component (cf. (30)) or from a derivation with a single instance of *em*, DP-coordination in the syntactic component, and P-duplication in the morphological component. See Ximenes 2002, 2004, Ximenes and Nunes 2004, and Nunes and Ximenes 2008 for discussion.

For the sake of completeness, it is worth noting that although the contrast in (28) also holds in formal BP, the scenario that triggers P-duplication in constructions such as (29b) never arises in the formal register. Given that P is generated outside CP, the adjacency requirement on morphological merger between P and the determiner of the embedded subject is not met due to the intervention of C (cf. (26)). Once morphological merger does not apply in the first conjunct, the Parallelism Requirement is vacuously satisfied and the structure surfaces with no contraction, as illustrated in (32).⁶

- (32) Eu pensei **em o** João e **a** Maria [*formal BP*]
 I thought in the João and **the** Maria
 fazerem esse trabalho
 do-INF.3PL this job
 ‘I think that João and Maria should do this job.’

Although less transparent than the cases discussed in the previous sections, preposition duplication in BP infinitival constructions can also be analyzed in terms of the interaction between a convergence condition – in this case the Parallelism Requirement applying to morphological structures – and the general economy condition regulating the insertion of material not present in the numeration.

⁶ Hans Broekhuis (p.c.) asks whether the contrast between the formal and colloquial registers of BP can be accounted for in OT terms if the constraints FUSION and FAITHFULNESS are ranked differently in each register, with FUSION being ranked higher than FAITHFULNESS in colloquial BP, but lower than FAITHFULNESS in formal BP. Although this suggestion would correctly account for the contrast between (29b) and (32), it would fail to account for the unacceptability of (i) in formal BP. Under a derivation with just one preposition in the derivation (see fn. 5), (i) should be the best candidate as the number of prepositions in the numeration and the final output is kept constant, in compliance with FAITHFULNESS.

- (i) * Eu pensei **em o** João e **a** Maria. [*formal/colloquial BP*]
 I thought in the João and the Maria
 ‘I thought about João and Maria.’

5 Concluding Remarks

This paper examined the realization of dummy prepositions in the phonological component, reviewing three cases of mismatch between what is generated by the syntactic component and what surfaces in the PF output. In all of them, a spurious preposition cannot be analyzed as part of the numeration that underlies the derivation, as this should lead to overgeneration. The solution of freely inserting such prepositions in the phonological component also leads to problems of overgeneration. The solution common to all cases is to assume that there is a general economy condition that enforces faithfulness between the lexical items that are present in the numeration that feeds the derivation and the lexical items of the PF output. All things being equal (i.e. when no convergence requirement is at stake), this faithfulness condition filters out insertion of lexical material not present in the numeration and blocks overgeneration. When convergence requirements of the morphological component having to do with Case or the Parallelism Requirement are at play, faithfulness will then be violated, yielding a mismatch between the structures generated by the syntactic component and their PF outputs.

References

- Arnold, M. 1995. Case, Periphrastic *Do*, and the Loss of Verb Movement in English. Doctoral Dissertation, University of Maryland.
- Bošković, Ž. 2006. Case Checking *versus* Case Assignment and the Case of Adverbial NPs. *Linguistic Inquiry* 37:522–533.
- Callaway, M. 1913. *The Infinitive in Anglo-Saxon*. Washington, D.C.: Carnegie Institution.
- Chomsky, N. 1986. *Knowledge of Language: Its Nature, Origin and Use*. New York: Praeger.

-
- Chomsky, N. 1995. *The Minimalist Program*. Cambridge, Mass.: The MIT Press.
- Chomsky, N. 2001. Derivation by Phase. In *Ken Hale: A Life in Language*, ed. by M. Kenstowicz, pp. 1–52. Cambridge, Mass.: The MIT Press.
- Corver, N. and J. Nunes. 2007. *The Copy Theory of Movement*. Amsterdam/Philadelphia: John Benjamins.
- Cyrino, S. 1997. *O Objeto Nulo no Português do Brasil: Um Estudo Sintático-Diacrônico*. Londrina: Editora UEL.
- Farrell, P. 1990. Null Objects in Brazilian Portuguese. *Natural Language and Linguistic Theory* 8:325–346.
- Ferreira, M. 2000. Argumentos Nulos em Português Brasileiro. Master's thesis, Universidade Estadual de Campinas.
- Felser, C. 1998. Perception and Control: A Minimalist Analysis of English Direct Perception Complements. *Journal of Linguistics* 34:351–385.
- Fox, D. 2000. *Economy and Semantic Interpretation*. Cambridge, Mass.: The MIT Press.
- Galves, C. 1989. O Objeto Nulo no Português Brasileiro: Percurso de uma Pesquisa. *Cadernos de Estudos Linguísticos* 17:65–90.
- Halle, M. and A. Marantz. 1993. Distributed Morphology and the Pieces of Inflection. In: *The View from Building 20: Essays in honor of Sylvain Bromberger*, ed. by K. Hale and S. J. Keyser, pp. 111–176. Cambridge, Mass.: The MIT Press.
- Hornstein, N., A. M. Martins, and J. Nunes. 2006. Infinitival Complements of Perception and Causative Verbs: A Case Study on Agreement and Intervention Effects in English and European Portuguese. *University of Maryland Working Papers in Linguistics* 14:81–110. (<http://ling.umd.edu/publications/volume14/>)

-
- Hornstein, N., A. M. Martins, and J. Nunes. 2008. Perception and Causative Structures in English and European Portuguese: ϕ -feature Agreement and the Distribution of Bare and Prepositional Infinitivals. *Syntax* 11:198–222.
- Kato, M. A. 1993. The Distribution of Pronouns and Null Elements in Object Position in Brazilian Portuguese. In *Linguistic Perspectives on the Romance Languages*, ed. by W. Ashby, M. M. G. Perissinotto, and E. Raposo, pp. 225–235. Amsterdam/Philadelphia: John Benjamins.
- Kato, M. A. 2008. Optional Prepositions in Brazilian Portuguese. Poster presented at the 38th Linguistic Symposium on Romance Languages (LSRL), University of Illinois at Urbana-Champaign, 4-6/4/08.]
- Kato, M. A. and J. Nunes (2008). A Uniform Raising Analysis for Standard and Nonstandard Relative Clauses in Brazilian Portuguese. Ms., Universidade Estadual de Campinas and Universidade de São Paulo.
- Lightfoot, D. 1979. *Principles of Diachronic Syntax*. Cambridge: Cambridge University Press.
- Lightfoot, D. 1991. *How to Set Parameters: Arguments from Language Change*. Cambridge Mass.: The MIT Press.
- Nunes, J. 1995. The Diachronic Distribution of Bare and Prepositional infinitives in English. In *Historical Linguistics 1993: Selected Papers from the 11th International Conference on Historical Linguistics*, ed. by H. Andersen, pp. 357–369. Amsterdam and Philadelphia: John Benjamins.
- Nunes, J. 1999. Linearization of Chains and Phonetic Realization of Chains Links. In *Working Minimalism*, ed. By S. Epstein and N. Hornstein, pp. 217–249. Cambridge Mass.: The MIT Press.
- Nunes, J. 2004. *Linearization of Chains and Sideward Movement*. Cambridge

-
- Mass.: The MIT Press.
- Nunes, J. and C. Ximenes. 2008. Preposition Contraction and Morphological Sideward Movement in Brazilian Portuguese. Ms., Universidade de São Paulo and MIT.
- Raposo, E. P. 1987. Romance Infinitival Clauses and Case Theory. In *Studies in Romance Languages*, ed. by C. Neidle & R. A. Nuñez-Cedeño, pp. 237–249. Dordrecht: Foris.
- Salles, H. 1997. Prepositions and the Syntax of Complementation. Doctoral dissertation, University of Wales.
- Williams, E. 1983. Against Small Clauses. *Linguistic Inquiry* 14:287–308.
- Ximenes, C. 2002. Contração de Preposição em Estruturas Coordenadas. Master's thesis, Universidade Estadual de Campinas
- Ximenes, C. 2004. Preposition Contraction in Coordinated Structures in Brazilian Portuguese. *MIT Working Papers in Linguistics*, 47:179–194.
- Ximenes, C. and J. Nunes 2004. Contraction and Duplication of Prepositions in Coordinated Structures in Brazilian Portuguese. In *WCFFL 23: Proceedings of the 23rd West Coast Conference on Formal Linguistics*, ed. by V. Chand, A. Kelleher, A. J. Rodriguez, and B. Schmeiser, pp. 815–828. Somerville: Cascadilla Press.
- Zagona, K. 1988. *Verb Phrase Syntax: A Parametric Study of English and Spanish*. Dordrecht: Kluwer.

Jairo Nunes
Departamento de Linguística
Universidade de São Paulo
Av. Prof. Luciano Gualberto 403
São Paulo, SP 05508-900
Brazil
jmnunes@usp.br
www.fflch.usp.br/dl/jmnunes