

ON THE SYNTAX OF NUMBER IN
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Abstract. Inflectional languages, and Romance languages in particular, display morphological variation in plural marking within the nominal domain. While standard varieties show plural inflection on all the constituents within the DP, other varieties show this plural marking only on some of its constituents. We investigate a set of puzzling data and propose that Number in Romance is not a head, but an adjunct, an optional and bi-valent morphosyntactic feature. We single out the hypothesis that, within the nominal domain, the PLURALIZER is in unmarked cases adjoined to D (i.e., a categorized *d* root), and in marked cases it is adjoined to a noun or an adjective (i.e., a categorized *n/a* root). We also discuss that instantiations of plural marking within the nominal domain should be conceived as the output of morphophonological concord, a post-syntactic operation that is sensitive to c-command.

1. Introduction

Number is commonly believed to express the property that nouns and pronouns have to refer to one or more than one individual entity. Furthermore, number is commonly believed to be semantically interpreted on the noun. This hypothesis follows from the classical theory that number makes a clear semantic contribution to the interpretation of nouns: singular nouns denote sets of atomic individuals (e.g., {*a*}, {*b*}, {*c*}), and plural nouns denote sets of pluralities (e.g., {*a,b*}, {*b,c*}, {*a,c*}, {*a,b,c*}).¹

Manifestations of number on adjectives, determiners, and verbs are commonly assumed to be the result of syntactic agreement and concord (Baker 2008, a.o.). In this paper we focus on the status of Number within the nominal domain in Romance. We neither deal with subject-verb

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¹ See Bartsch (1973), Hausser (1974), Bennett (1975), Eschenbach (1993), Schwarzschild (1996), Sauerland (2003) Rullmann and You (2006), among others, for the semantics of Number.

agreement, nor with the constraints on number depending on verb classes and the object selected by these verbs.

If we consider Romance languages we observe great morphological variation in the instantiations of Number. Thus, in standard Spanish, the two inflectional forms, singular and plural, must be instantiated both on the article and on the noun in (1).²

- (1) a. el libro Spanish
 the.SG book.SG
 b. los libros
 the.PL book.PL
 c. *el libros
 the.SG book.PL
 d. *los libro
 the.PL book.SG

By contrast, a set of studies (Delfitto & Schrotten 1991, Bouchard 2002, Dobrovie-Sorin 2012, Cyrino & Espinal 2015b, a.o.) have pointed out the fact that other Romance languages, Brazilian Portuguese and French in particular, encode Number on the D(eterminer) rather than on the N(oun). Consider (2) and (3).

- (2) a. o livro Brazilian Portuguese
 the.SG book.SG
 b. os livros
 the.PL book.PL
 c. *o livros
 the.SG book.PL
 d. os livro
 the.PL book.SG
- (3) a. le livre French
 the.SG book.SG
 [lə]
 b. les livres
 the.PL book.PL
 [le]

As for the variation illustrated in (2) for Brazilian Portuguese, the reader should bear in mind that it has been documented in several studies that focus on the sociolinguistics of this language (Lemle & Naro 1977; Braga & Scherre 1976; Naro 1981; Guy 1981; Scherre 1988, 1994; Scherre & Naro 1998; Lopes 2006; a.o.). Regarding the contrast between (2b-d) it should be pointed out that, although

² Abbreviations are as follows: SG = singular, PL = plural, DOM = differential object marking, F = feminine, M = masculine, DEM = demonstrative, DIM = diminutive.

occurrences such as *o livros* are ungrammatical in adult grammar, they are produced by Brazilian Portuguese children in early stages of acquisition of the language.³

The case of French, as opposed to English, is well known for being paradigmatic of a language that, being inflectional, encodes Number on D, but not on N, in spite of the written spelling. Furthermore, contemporary French is interesting for being a language in which sigmatic plural (plural form in *-s*) reduces to liaison, although French orthography still reflects an early sigmatic plural of the language and examples with multiple plural marking can also be found (e.g., *les bons amis* [lebõzam'i]).⁴

Bouchard (2002) presents several arguments that support the claim that Number is encoded on D in French. Among them, he mentions the fact that in certain compound nouns that consist of V+N units Number is specified only on the article, in order to make the distinction between reference to an atom or to a plurality of atoms. Note that the same applies to Spanish, in spite of the fact that in this language the object of V+N units tends to include nouns specified for morphological plural number.

- | | | | | |
|-----|----|--------|-------------------|---------|
| (4) | a. | l' | ouvre-boîte | French |
| | | the.SG | open-can | |
| | | | ‘the can-opener’ | |
| | b. | les | ouvre-boîte(s) | |
| | | the.PL | open-can.(PL) | |
| | | | ‘the can-openers’ | |
| | | | | |
| (5) | a. | el | abrelatas | Spanish |
| | | the.SG | open-can.PL | |
| | | | ‘the can-opener’ | |
| | b. | los | abrelatas | |
| | | the.PL | open-can.PL | |
| | | | ‘the can-openers’ | |

A second argument adduced by Bouchard is based on the fact that it is possible to conjoin articles in French by means of which number uncertainty is conveyed. The same is also possible in Spanish.

³ Lopes (2006:259): “at age 2;1, [children] start producing both the ungrammatical and redundant agreement; the non-redundant forms are verified at age 2;3. Slowly, the ungrammatical forms give way to the redundant and non-redundant patterns, but are still found in the last age examined (3;7)”.

⁴ Sigmatic plurals are characteristic of Western Romance languages, while non-sigmatic plurals (vocalic) are characteristic of Eastern Romance forms. The former comes from Latin plural accusative forms, while vocalic plurals’ origin is under debate, deriving either from Latin nominative endings or from Latin accusative endings. See D’Hulst (2006), Maiden et al. (2010), and references therein for further information. See also Sauzet (2012) for a special reference to non-sigmatic plural in Occitan dialects, and Cappellaro (2018) for a reference on the variation of non-sigmatic plural in the Ladin speaking area in Northern Italy.

(6) Vous prendrez le ou les garçons que vous trouverez.
 you take the.SG or the.PL boy.PL that you find
 ‘Take the boy or the boys that you find.’

(7) Felicita al o a los doctorandos que
 congratulate DOM.the.SG or DOM the.PL PhD.students that
 saludes.
 meet
 ‘Congratulate the PhD student or PhD students that you meet.’

In English, by contrast, plural is marked on the noun, as the translations in (6) and (7) show.

The third argument is based on the phenomenon of nominal ellipsis. This argument again shows that Number is encoded on D not only in French (Bouchard 2002), but also in Spanish (Torrego 1987, Saab 2019). Consider (8) and (9).

(8) Donnez-moi les verts.
 give.me the.PL green.PL
 ‘Give me the green ones.’

(9) a. Juan visitó a su tío y Pedro prometió visitar a
 Juan visited DOM his uncle and Pedro promised visit DOM
 los de él.
 the.PL of him
 ‘Juan visited his uncle and Pedro promised to visit his uncles.’
 b. la hija de Ana y las de Luisa (RAE 2009:129)
 the.SG daughter of Ana and the.PL of Luisa
 ‘the daughter of Ana and the ones of Luisa’

Given this variation among inflectional languages the aim of this paper is to focus on the following questions. First, *where is Number encoded in Romance*, as opposed to other inflectional languages such as English? We will investigate whether Bouchard’s (2002) idea that French encodes semantic Number on D, whereas English encodes it on N, can be extended not only to Brazilian Portuguese, but also to other Romance languages that apparently require plural marking on D as well as on N, as for example: Catalan, Italian, and Spanish.⁵ Second, *how is Number encoded in Romance*, as opposed to other inflectional languages such as English? A proposal has been made in the literature

⁵ We will hereby focus on Romance languages and some of its dialects, although we are aware of the fact that some Germanic languages other than English, like Dutch, behave similar to Spanish regarding some properties mentioned below.

Beyond the Romance and Germanic paradigms, Basque is another language that shows lack of plural agreement (Artiagoitia 2002; Ortman 2000; Baker 2008) and where plural marking rests on the article. In this language “The need to mark number on nouns explicitly by means of the plural marker [-k] forces the definite article [-a] to be also present” (Etxeberria 2014:19).

(Wiltschko 2008) that Number is syntactically either a head in inflectional languages (as in English) or a modifying feature in non-inflectional languages (as in Halkomelem). On the other hand, Dobrovie-Sorin (2012) holds the hypothesis that Number should not be considered a syntactic category (the head of NumP), but a feature that can attach to either D (in Romance) or to *n* (in English).

In this paper we will put forward the hypothesis that Number in Romance is encoded as a syntactic adjunct to D (i.e., a categorized *d* root) by default, and to a categorized *n/a* root in marked cases. Manifestations of (plural) number on other constituents within the nominal domain are to be considered in most cases the output of post-syntactic morphophonological concord. This hypothesis will allow us to account for the set of patterns of plural marking within the DP described in the literature (Pomino 2012:208, table 1; Cavirani 2018), although we do not discard that at the mapping from syntax to exponence additional morphophonological constraints may apply to account for the whole set of plural marking/agreement shown in Romance varieties.

To answer the above two questions, Section 2 is devoted to the discussion of new data that support the claim that Number in Romance is encoded on D. Section 3 presents the classical hypothesis within Generative Grammar that Number is a functional category. In Section 4 we present an alternative analysis according to which Number in Romance is conceived as an adjunct: adjunct to *d* in default cases, and adjunct to *n/a* in marked cases. Marked cases basically include number marking in various types of nominal compounds in Brazilian Portuguese, Catalan and Spanish, and plural marking on feminine nouns and prenominal adjectives in various Lunigiana dialects⁶ (Manzini & Savoia 2005, Pomino 2012, Cavirani 2018). For the default cases we will postulate at the first stage of the mapping from syntax to phonology a post-syntactic operation of Concord that predicts that if a D is modified by a plural marker all the constituents this plural marker c-commands within the DP may/must (depending on the language) show exponence of a plural marker. That is, this morphophonological operation is optional in languages such as popular Brazilian Portuguese, but it is obligatory in languages such as standard Spanish. Our account of marked cases, by which *n/a* is modified by a plural marker, will allow us to explain that pluralization on *n/a* can even take place before *n/a* merges with the feminine suffix, as observed in certain Italian dialects. Finally, Section 5 concludes the paper.

⁶ Lunigiana is a geolinguistic domain extending over the borders between Liguria, Emilia and Tuscany.

2. Puzzling data on plural marking

In this section we consider some phenomena, in addition to the set of facts argued by Bouchard (2002) for French, that support the claim that plural marking in Romance languages is encoded, by default, on D.

2.1. *Lack of plural agreement and partial plural marking*

Brazilian Portuguese is well known among Romance languages for showing sociolinguistic variation within the DP (Scherre 1994, Scherre & Naro 1998, Lopes 2006, among many others). This is illustrated in the examples in (10) and (11), all of them meaning ‘Brazilians are hardworking’ (Müller 2002, Cyrino & Espinal 2015b).

- (10) a. O brasileiro é trabalhador.
 the.SG Brazilian is hardworking
 b. Os brasileiros são trabalhadores
 the.PL Brazilian.PL are hardworking.PL
 c. Os brasileiro é trabalhador.
 the.PL Brazilian is hardworking.SG
 d. Os brasileiro são trabalhadores.
 the.PL Brazilian are hardworking.PL
 e. *O brasileiros é trabalhadores.
 the Brazilian.PL is hardworking.PL
- (11) a. Brasileiro é trabalhador.
 Brazilian is hardworking
 b. Brasileiros são trabalhadores.
 Brazilian.PL are hardworking.PL

What is interesting to observe is that the subject may have an overt or a covert D, plural marking may be instantiated in the two constituents (D and N) of the subject or only on the D, but not on the N alone (10e) if the article is present, and plural agreement may be optionally instantiated on the VP. Accordingly, Brazilian Portuguese has been analyzed as a DP language for which a null D may be postulated (Munn & Schmitt 2005),

- (14) Kes fdju Cape Verdean Creole
 these son.SG
 ‘these children’
- (15) Os fio Afro-Brazilian Portuguese
 the.PL son.SG
 ‘these children’

Among Romance language varieties that illustrate the phenomenon of lack of plural agreement within the DP, Lunigiana dialects deserve special attention (Manzini & Savoia 2005, Rasom 2008, Pomino 2012, Cavirani 2018). Thus, whereas old and new generations of Colonnatese mark plural on both the D and the N, new generations also show the possibility that plural morphology appears only on D (Cavirani 2018:12, table 6). Thus, the data in (16b) suggest that Colonnatese patterns like Brazilian Portuguese (see example (2d), (10c)) in terms of encoding plural marking only on D.¹⁰

- (16) a. [ʎa 'dɔnʎa] Colonnatese
 the.PL.F woman.PL.F
 ‘the women’
- b. [ʎa 'dɔna]
 the.PL.F woman.F
 ‘the women’

Similarly, Pomino (2012) points out the existence of data from French and Maritime Provençal with plural marking only on D but not on N. Consider (17) (from Pomino 2012:202–3, exs. (1c,a)). Note that, independently of the written *-s* in French, both languages illustrate non-sigmatic (vocalic) plural on D.

- (17) a. mes deux filles French
 [me dø fiʝ]
 my.PL two girl.F.SG
 ‘my two girls’
- b. l-i sièis fih-o Maritime Provençal
 the.PL six girl.F.SG
 ‘the six girls’

¹⁰ Note that plural marking on the article is manifested by palatalization of the consonant, and plural marking on the N is manifested by the glide before the final vowel.

Other dialects show patterns similar to child Brazilian Portuguese (e.g., *o livros* lit. the book.PL; Lopes 2006) and North Eastern Central Catalan (e.g., *aquell llibres* lit. that book.PL; Nevins 2011, Bonet et al. 2015), where plural morphology appears only on the N. In Amegliese this is manifested through the glide before the final vowel that instantiates the gender suffix. We will account for these data in Section 4.2.

- (i) a fantja Amegliese
 the.F girl.PL.F
 ‘the girls’

Partial plural agreement has been also observed in Afro-Bolivian Spanish (Delicado-Cantero & Sessarego 2011), which shows that number can be specified only on determiners of all types: “as a rule, the nominal and the adjectival stems remain bare, so that plural marking is non-redundant”. Consider the examples in (18) (from Delicado-Cantero & Sessarego 2011:43–4, exs. (1a), (2b)).

- (18) a. Mis buen amigo mayó.
 my.PL good.M.SG friend.M.SG old.SG
 ‘My old good friends.’
 b. Muchos hombre boliviano.
 many.PL man.SG Bolivian.SG
 ‘Many Bolivian men.’

Similarly, in Brazilian Portuguese partial agreement is observed in sequences that include a postnominal adjective, such as the ones illustrated in (19) (adapted from Cyrino & Espinal 2015b: 478, ex. (9)). Overall these examples show that plural marking must be encoded on D, and concord on the adjective and on the noun within the DP is optional. See the paradigm in (19).

- (19) a. As meninas bonitas.
 the.PL girl.PL pretty.PL
 b. As meninas bonita.
 the.PL girl.PL pretty
 c. As menina bonita.
 the.PL girl pretty
 ‘The pretty girls.’
 d. *As menina bonitas.
 the.PL girl pretty.PL

Finally, also interesting regarding the issue of partial plural marking is the set of data in (20) and (21) (Manzini & Savoia 2005, Pomino 2012, Cavarini 2018). In (20) a contrast is observed depending on whether the adjective is prenominal or postnominal. In (21) the prenominal adjective may or may not show plural marking because already the demonstrative does. But, what is crucial in all these examples is that a non-sigmatic plural marking is encoded on D. Concord on the adjective and on the noun is optional.¹¹

- (20) a. l-ei bèllei fih-o Maritime Provençal (Pomino 2012)
 the.PL beautiful.PL girl.F.SG
 b. l-ei fih-o bell-o
 the.PL girl.F.SG beautiful.F.SG
 ‘the beautiful girls’

¹¹ In Section 4 we will also consider marked data from Lunigiana dialects where the plural marking is manifested only on the adjective or only on the noun, but not on the article.

- (21) a. [stja 'bɛja an'tʃuga] Amegliese (Cavirani 2018)
 DEM.PL.F beautiful.PL.F anchovy.F.SG
 'these beautiful anchovies'
- b. [kja 'brava 'dɔna] Filattiese (Pomino 2012)
 DEM.PL.F good.F woman. F.SG
 'those good women'

To sum up, in this section we have illustrated both the presence of lack of agreement and partial plural agreement in various constructions in Romance varieties. In the next section we move to data that involve pronouns, clitics and possessives.

2.2. Plural marking on pronouns, clitics and possessives

Here we would like to point out that Spanish first and second strong plural personal pronouns function as determiners that allow nominal complements in so-called solemn speech. In relation to this property, note that in (22) (from RAE 2009) only the personal pronoun, but neither the nominal complement (*el Rey* 'the King') or the nominal apposition (*majestad* 'majesty'), shows plural marking and triggers plural agreement on the verb, thus suggesting that plural marking is encoded on the head of the determiner (i.e., the strong pronoun).¹²

- (22) a. *Nos* el Rey (...) ordenamos y mandamos ...
 we the king order.PL and command.PL ...
 'We, the king, order and command...'
- b. *Vos*, majestad, sabéis de vuestros desvelos.
 you.PL majesty know.PL of your.PL sleeplessness.PL
 'You, your majesty, know about your sleeplessness.'

Let us now consider the case of clitics. Catalan third person plural clitics do encode ϕ -features and have DP plural antecedents, as illustrated in (23), thus suggesting that the clitic in (23A) –exactly like the article in (23Q)– is specified with plural marking.

- (23) Q. Que porta *els* anells?
 Q wears the.PL rings
 'Does he wear the rings?'
- A. Sí que *els* porta.
 yes that them wears
 'Yes, he does.'

¹² For an analysis of first and second person pronouns (as opposed to third person pronouns) as Ds, see Ritter (1991) and Déchaine & Wiltschko (2002).

In contrast to third person clitics, Pro-N clitics, such as the Catalan clitic pronoun *en*, which correlate with an N syntax (Déchaine & Wiltschko 2002, a.o.),¹³ are not specified with plural marking. This is illustrated in (24), where the clitic *en* has as an antecedent the bare object nominal of a V+N complex predicate, which is not specified for Number and is semantically number neutral (Espinal 2010, Espinal & McNally 2011).

- (24) En Joan porta *barret*. *En* porta durant tot l'hivern.
 D Joan wears hat en wears during all the.winter
 'Joan is a hat-wearer. He wears one during all winter.'

When the antecedent is a bare plural, the clitic still has as antecedent the nominal stem but morphosyntactic Number must be dissociated from the N. Thus, in the structure (25Ab) for (25Aa) even though the denotation of the cardinal may involve a plurality of atoms, no morphosyntactic Number is encoded on the pro-N. On the other hand, the bare plural antecedent (*anells* 'rings') is assumed to have a syntactic DP structure with a null D (Longobardi 1994, Chierchia 1998) specified for plurality, with overt exponence of the plural marker on the noun at the time of Vocabulary Insertion. See Section 4.1 for further details.

- (25) Q. Que porta *anells*?
 Q wears rings
 'Does he wear any rings?'
 A. a. *En* porta {tres, un}.
 en wears three one
 'He wears {three, one}.'
 b. [_{NP} E_{N_i}] porta [_{CardP} {tres, un}] [_{NP} e_i]

Finally, it is interesting to consider the variation in plural marking shown in possessive constructions. Let us first consider the Brazilian Portuguese possessives in (26), all meaning 'my things'.

- (26) a. (as) minhas coisas
 the.PL my.PL thing.PL
 b. (as) minhas coisa
 the.PL my.PL thing
 c. (a) minhas coisa
 the my.PL thing
 d. ??as minha coisa
 the.PL my thing

On the one hand, these examples show that the true determiner is basically the possessive (like in English), and that the article (which may or may not instantiate morphological number) is optional in Brazilian

¹³ See also Kayne (1975), Pollock (1998), among others, for analyses of so-called partitive *en* in French.

Portuguese (see Castro 2006, Floripi 2008, a.o.). On the other hand, since the possessive is the head of the D-Poss complex unit (Despić 2015),¹⁴ it is the constituent that encodes plural marking at syntax.¹⁵ For these examples, as will be discussed below, we assume that the potential plural marking on the definite article in (26a,b) is the output of an operation of postsyntactic concord within the DP domain. We come back to these cases in Section 4.1. By contrast, the acceptance of examples like (26d) would depend on the possibility that for certain native speakers of Brazilian Portuguese the article may also be the head of a D-Poss complex unit.

Similar examples to (26b,c,d) are observed in various Lunigiana dialects. Consider (27).

- (27) a. [ʎa 'nɔʃtrja ka] Colonnatese (Cavirani 2018)
 the.PL.F our.PL.F house.F
 'our houses'
- b. [ʎa 'nɔʃtra 'letra] Colonnatese
 the.PL.F our.F letter.F
 'our letters'
- c. [la 'nɔstrja 'kɔza] Mulazzese
 the.F our.PL.F thing.F
 'our things'

To sum up, in this section we have shown that strong pronouns, third person clitics (in contrast to pro-N clitics), and possessives, are determiner-like constituents, and as such that they can be the only constituents within a DP specified for plural marking that trigger plural concord post-syntactically.

In the next section we consider plural marking on determiners in relative constructions.

2.3. *Plural marking on relatives*

In regular relatives (modified DPs) the complement of the D has been postulated to be not an NP, but a CP (Kayne 1994, Bianchi 1999, de Vries 2002).¹⁶

¹⁴ For alternative analyses of possessives within the generative tradition see also Szabolcsi (1983), Kayne (1994).

¹⁵ In European Portuguese, only (26a) is possible, and the article is obligatory before the prenominal possessive. See Castro (2006), who on the basis of the differences between Brazilian and European Portuguese proposes that in both languages the possessive behaves as the head of the DP, and the article (that could also be null in Brazilian Portuguese) is an expletive element adjoined to D.

¹⁶ Assuming this analysis, it is the D that selects a relative CP as its complement. The relative clause head noun is generated inside this CP and raises to its specifier. See the representation in (i):

- (i) a. This is the book that I bought.
 b. [_{DP} [D the] [_{CP} book_i [_C that [I bought <book_i>]]]]

In the particular case of free relatives (28a,b) the *wh*-phrase of the embedded CP has been postulated to move to [Spec, DP] whose head is a silent D (Caponigro 2002). This movement, followed by Spec-Head agreement within the DP, has been postulated in the syntactic literature in order to explain the plurality of the *wh*-word in (28b). However, what is crucial for us is the locus of plural number, which seems to be associated with the D head.

- (28) a. Quien llegue antes...
 whoever.SG arrive.SG before
 ‘Whoever arrives before...’
 b. *Quienes* lleguen antes...
 whoever.PL arrive.PL before
 ‘Whoever arrive before...’

In semi-free relatives (de Vries 2000) the D is not silent. There is no Noun to trigger plural agreement on the verb, and plural marking, if present, can only be encoded and interpreted on the article, as illustrated in (29).

- (29) *Los* que lleguen antes...
 the.PL that arrive.PL before...
 ‘The (ones) that arrive before...’

Note that both *quienes* in (28b) and *los* in (29) are determiners that show overt plural marking.

To sum up, in this section we have presented a variety of data on plural marking and plural agreement that supports the hypothesis that Number, by default, both in standard and non-standard varieties of Romance languages appears to be encoded and interpreted on D. The set of phenomena we have presented differentiates Romance from other inflectional languages, such as English, for which it has been claimed that Number is encoded on N. Because of this contrast, in the next section we will review the extent to which NumP must be considered obligatory in inflectional languages, and some of the most relevant macroparametric and microparametric approaches to Number discussed in the generative literature will be presented. In Section 3 two different views will be analyzed: Number as a functional category and Number as an adjunct. We will explore the hypothesis that Number in Romance is a modifying morphosyntactic feature, optional and bivalent, denoting a set of atoms if -PL, and denoting the set of all pluralities that can be constructed from these atoms if +PL. Number is encoded as a syntactic adjunct to D (i.e., a categorized *d* root) by default, and to a categorized *n/a* root in marked cases. Manifestations of (plural) Number on other constituents within the nominal domain will be considered basically the output of morphophonological agreement or concord.

3. Number in the generative literature

In this section we will first review the proposal that Number is a functional category (Section 3.1), and second we will postulate the new hypothesis that Number is a modifying feature (Section 3.3). In Section 3.2 we provide independent evidence that support the claim that Number is not obligatory in Romance.

3.1. *Number as a functional category*

Since the 80s, linguists have considered similarities that might exist between the structure of DPs and the structure of CPs. In the beginning of the 90s, some studies (Ritter 1991, 1992; Bernstein 1991; Valois 1991; among others) postulated the existence of inflectional categories between the DP and the NP that could correspond to functional categories between the CP and the VP. Thus, parallel to IP, Number Phrase (NumP) (and Gender Phrase, Picallo 1991) was postulated in generative syntax, the main motivation being related to the positioning of constituents within the DP domain.

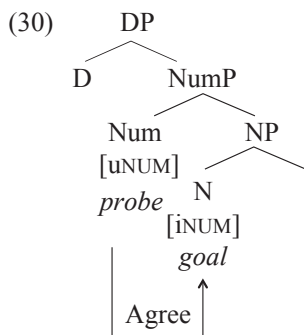
The type of evidence that backed up the proposals for these functional categories came mainly from the fact that they could provide either landing sites for the N that has moved out of its base, or positions to accommodate elements and explain the orders they may appear in a DP in certain languages. Ritter (1991, 1992), for example, proposed the need of a Number head (Num) between the D and the N in order to provide a landing site for N movement of possessors in Hebrew. Thus, *beyt ha-mora ha-gadol* lit. house the-teacher the-big ‘the teacher’s big house’ was associated with the following output structure: $[DP [D \text{beyt}_i] [_{NumP} [_{Poss} \text{ha mora}_j] [_{Num'} [_{Num}] [_{NP} [_{AP} \text{ha gadol}] [_{NP} t_j [_{N'} [_{N} t_i]]]]]]]]$.

Another proposal for such a functional head was advanced by Picallo (1991) in order to explain the order of possessors and genitives in Catalan. She shows that in Catalan only possessive pronouns can precede the nominal head, and she assumes that the former moves to the specifier of Num, where it is placed between the D and the N. Thus, in order to derive *les seves novel·les de Nabokov* lit. the {his, her, their} novels of Nabokov ‘{his, her, their} novels of Nabokov’, this author postulates that the possessive undergoes Move α to the specifier position of NumP.

Thus, the postulation of this functional category aimed to provide a position to accommodate moved elements inside the DP. However, no connection was established in these initial studies between the postulation of Number and the meaning of plural marking in the languages studied.

More recently, within the Minimalist Program framework of Generative Grammar (Chomsky 1995, 2000, 2001), whereby lexical items, including functional heads, are feature-bundles, it has been proposed that movement of N to Num, for example, should be triggered by the functional head Num

which contains uninterpretable number features that will attract the noun containing interpretable features. Feature checking (or valuation) is obtained via the operation Agree, which operates between the c-commanding item, the *probe*, and the c-commanded item, the *goal*. Thus, in languages where Number is an interpretable ([iNUM]) feature on Ns, one could propose feature valuation, as formalized in (30):



However, at this point, the questions that arise are: what is the syntactic status of Number in Romance? Does NumP project obligatorily? More specifically, how can the interesting data presented in Section 2, which shows that in some Romance languages Number appears only on D, be best accounted for? That is, considering these data and the fact that in (30) the head D c-commands the functional head Num, how can the uninterpretable features of the latter head be checked?

3.2. On the status of Number in Romance: NumP is not obligatory

The common wisdom in the literature on the syntax of Number is that both in English and Romance, as in the rest of (even poorer) inflectional languages such as Romance based creoles, number is obligatorily specified in the nominal domain, and therefore NumP is obligatorily projected (Déprez 2005, Wiltschko 2008, Kim et al. 2017, among others). By contrast, in non-inflectional languages, that is, in languages where nominal expressions are unspecified for number (e.g., Mandarin Chinese, Halkomelem, Blackfoot), these nominal expressions display general number (Corbett 2000), interpreted as ‘one or more than one’ and associated with a reading according to which the denotation of the plural noun is a subset of the denotation of the bare (general) noun (Kim et al. 2019:10).

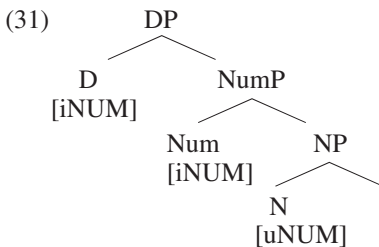
Besides these considerations, since the beginning of the 21st century a number of studies have focused on the syntax-semantics interface of Number, by assuming that the functional projection NumP is the locus for plurality. Thus, it has been argued (Ghomeshi 2003, Borer 2005) that

the mass/count distinction is determined by the same functional category that hosts plural marking (#P, NumP or ClassP), which captures the fact that plural marking cannot combine with mass nouns.¹⁷

We acknowledge the fact that Chierchia (1998) hypothesized that morphology must be taken to serve as a trigger of a universal semantic parameter. Thus, his Nominal Mapping Parameter distinguishes between Mandarin Chinese, a language with no plural morphology and with no mass/count distinction, for which nominal expressions are [+arg, -pred], French, a language with plural morphology and with a mass/count distinction, for which nominal expressions are [-arg, +pred], and English, a language that shows a mixed behavior, where bare nominals are [+arg] and bare singulars are [+pred].

On the other hand, Déprez (2005) holds that morphology does not by itself play a direct role in the interpretation of bare nominals, and addresses the difference between inflectional (+PL) languages and non-inflectional (-PL) languages by postulating a Plural Syntactic macroparameter that establishes that in +PL languages NumP must project and contain a counter, whereas in -PL languages NumP is optional, and a counter is optional too. According to this author, plural morphology only determines whether a syntactic node NumP is obligatorily projected or not in a given language, and the presence of NumP in a nominal projection plays a compositional role in determining its interpretation.

There have also been various attempts in the literature to account for the encoding of plural marking on D in Romance by postulating a NumP projection. Cyrino & Espinal (2011, 2015a, 2015b) propose that, since Brazilian Portuguese seems to pattern with French in that D is the locus of Number marking, the N in this language is associated with a uninterpretable Number [uNUM] feature that needs to be valued by a matching interpretable Number [iNUM] feature in both the heads Num and D. See the structure in (31).



¹⁷ In Wiltshko (2008:668) it is shown that Halkomelem mass nouns can be pluralized, and that plural marking in this language is not sensitive to a mass/count distinction. Therefore, this author concludes that in this language plural marking is not associated with #.

Note that Wiltshko's (2008) # is associated with one of two values: SINGULAR, spelled out as \emptyset in English and Romance, or PLURAL, spelled out by means of some allomorph. By contrast, Borer's (2005) # is associated with quantity, spelled out by means of cardinals or quantifiers.

However, the Agree relation relevant in (31) appears to hold in an inverse fashion than what is the standard situation of Agree. As seen above (see the structure in (30)), in the standard case, a Probe bears uninterpretable features and searches its c-command domain for an active element bearing the interpretable counterparts of its unvalued features. In order to explain feature valuation in (31), the authors have to resort to an operation called *Inverse Agree* (Biberauer & Roberts 2011, Biberauer & Zeijlstra 2012), whereby the agreement relation operates inversely: the [inum] features in both D and Num c-command (possibly multiple) uninterpretable [unum] features.

In a relevant paper on this topic, Mathieu (2009) argues that the appearance of determiners in Old French from a determinerless language like Latin was caused diachronically by the loss of number marking on nouns. He relies on the existence of a functional head Num, which is associated with uninterpretable features that need to be checked. In Old French, where nouns are marked for number, they can check these uninterpretable features in Num. Mathieu correlates the appearance of determiners at the time when N was no longer associated with number features. Therefore, the loss of number marking on nouns leads to the use of determiners, which begin to encode number, and start to become obligatory. Since the uninterpretable features on Num needed to be checked, he proposes that in Old French this had to be done via an operation of Cyclic Agree (Rezac 2003): first, there is an attempt of checking Num uninterpretable features against the features of the N, which fails because there are no such features in N, the complement of Num; then, an outer specifier of Num is merged, as a kind of last resort, where the determiner is positioned, and Agree takes place. Determiners then raise to the D domain where definiteness is encoded,¹⁸ and, through time, movement becomes merge, as an instance of grammaticalization. Following this type of account, the operation of Cyclic Agree is postulated in order to explain the plural marking on the determiners, and in its second step, checking is achieved via something similar as the Inverse Agree operation we saw above.

However, the postulation of a syntactic NumP does not appear as an optimal solution to explain the patterns we find with respect to plural marking in Romance, since it does not lead to a uniform principled explanation for the variation in the data we saw in Section 2. If we assume the functional head Num as responsible for plural marking, and not only as a landing site for movement, we run into difficulties to explain why the checking of uninterpretable features is achieved sometimes via Agree, other times via Inverse Agree and still others via Cyclic Agree.

¹⁸ In Old French determiners did not occupy D, but, according to Mathieu, were positioned in an (outer) specifier of NumP, which the author assumes is a focus projection, since the determiner was used when a speaker wanted to emphasize a particular nominal.

Additionally, if Num were a head responsible for plural marking, we would not be able to explain the variation in plural marking shown in the specific cases of possessive constructions in Brazilian Portuguese shown in examples (26) above. We have seen that the article is optional and the possessive is the constituent that encodes plural marking. This variation would be very hard to account for if plural marking were the result of an (Inverse or Cyclic) Agree operation, since we would not be able to explain why the article, when present, may not show the plural marking.

Another case that makes explicit the difficulties that stem from the postulation of a Num head is the fact that plural marking may show up inside determiner compounds, as in the Spanish *cualesquiera* lit. what.PL.want ‘whatever’. As will be discussed in Section 4.2, in order to explain these data it is not possible to rely on a syntactic category NumP within the DP, since plural marking is encoded at the level of word formation.

Because of these issues, in Section 3.3 we investigate another alternative that has been advanced in the literature on plural marking and that does not include the postulation of a functional head feature Num.

3.3. *Some assumptions. Number as an adjunct in Romance*

In the present paper we assume (following Bosweld de Smet 1997, Déprez 2005:867, contra Borer 2005) that notions such as mass and count are lexical in nature, and they must be distinguished from notions such as countability, which are structural. A piece of evidence in support of this claim comes from inflectional languages (such as Greek, Tsoulas 2006, Alexiadou 2011) that allow mass nouns with plural marking.¹⁹

Furthermore, in this paper we assume that all nouns (no matter whether they are lexically count or mass) denote properties of kinds (Dobrovie-Sorin & Pires de Oliveira 2008; Espinal & McNally 2007, 2011; Espinal 2010; Borik & Espinal 2015; McNally & de Swart 2015).

The appearance of plural morphology on the noun or on the determiner does not seem to be strong enough to support the postulation of a functional projection such as a NumP. Recall that, concerning Romance languages, it has been traditionally conceived that they have a two-way number contrast within the DP/NP domain, nominal

¹⁹ See also the following example from Spanish (https://es.wikipedia.org/wiki/Tratamiento_de_lodos. Accessed on January 14, 2019).

- (i) El tratamiento de *los lodos* producido en las plantas de tratamiento de
the treatment of the mud.PL produced at the plants of treatment of
aguas residuales.
water.PL residual.PL
‘The treatment of mud produced at the plants of treatment of residual water.’

expressions being specified either for singular or plural morphological number. However, it has also been argued in the literature that there are DPs and NPs without NumP. Definite kinds (e.g., Spanish *El colibrí está en todas partes* lit. the hummingbird is in every parts ‘The hummingbird is everywhere’) illustrate the former (Borik & Espinal 2012, 2015), for which it has been postulated that the D combines directly with the N with no intervening Number, the output meaning being that the iota operator turns properties of kinds into kind expressions. Bare nominals in object position of *have*-predicates (e.g., Spanish *llevar bolso* lit. wear bag ‘to wear a bag’) illustrate the second situation: NPs with no Number. It has been argued (Espinal 2010; Espinal & McNally 2007, 2011) that these bare nominals have a number neutral interpretation,²⁰ and modify the verbal event by pseudo-incorporation, with no instantiation of the theme argument.

Now, given the fact that nominal expressions are not always associated with number, we conclude that NumP is not obligatory in Romance. Note that absence of a morphosyntactic head Number results in a morphological form similar to singular inflection, but which we assume is not specified for Number. Hence, the relevant question that arises is what is the status of Number in Romance? Considering the above discussion, we hypothesize that Number does not correspond to a morphosyntactic functional head. In this paper we postulate that the PLURALIZER is a modifying feature, which is optional (it might not be in a structure) and bivalent (it can either be +PL, realized by means of a sigmatic or a non-sigmatic plural, and interpreted as referring to pluralities of atoms; and -PL, realized by a zero suffix, and interpreted as referring to atoms). The presence of a modifying feature, a PLURALIZER, introduces a Realization operator (see Carlson 1977) and contributes to the meaning of the modified structure in two different ways: when adjoined to *n/a*, it turns a property (the denotation of the root) into another property; when adjoined to D/*d*, it turns an entity (a kind, the output of applying the iota operator to a property of kinds) into another entity (an individual object or a set of objects).

Our analysis of the Romance data is inspired on the observation that plural marking comes in many guises in natural languages and

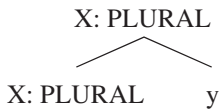
²⁰ The semantic notion of number neutrality should be distinguished from the morphological notion of general number (Corbett 2000). General number characterizes lexical roots in those languages for which number is less dominant, and in which the meaning of the noun can be expressed without reference to number (e.g. the Cushitic language Bayso, Corbett 2000; Mandarin Chinese, Rullmann & You 2006; and Norwegian, Halmøy 2007). In these languages nominal forms that have no suffix expressing general meaning, and therefore are interpreted as entailing ‘one or more *x*’. In contrast, number neutrality characterizes the meaning of nominal expressions under-specified for number in languages that usually express number, as is the case of Spanish. See Espinal (2010) for further details on number neutrality.

does not universally merge with nouns (Déprez 2005, Dobrovie-Sorin 2012, Mathieu 2014, Alexiadou 2016, Wiltschko 2008). Wiltschko (2008), in particular, postulates two macroparameters: that PLURAL can be merged as a head feature (as in English, an inflectional language) or as a modifier/adjunct (as in Halkomelem, a non-inflectional language), as represented in (32a); and that PLURAL can merge at different positions within the nominal domain, as represented in (32b).

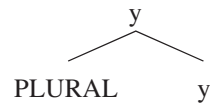
(32) *Parameters of plural marking* (Wiltschko 2008:688)

a. How is plural merged?

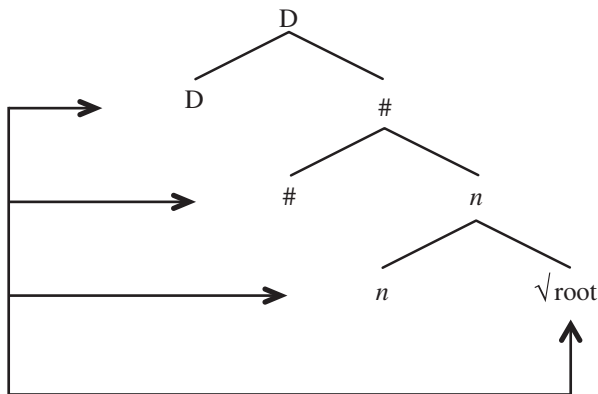
(i) as a head



(ii) as a modifier



b. Where is plural merged?



Note that these macroparameters aim at characterizing the distinction between inflectional and non-inflectional languages on the basis of distinguishing whether Number is a head feature in one group of languages but a modifying feature in a second group of languages, and

whether Number can modify various constituents within the nominal spine.²¹ With reference to the representation in (32b) Wiltschko concludes that plural marking in English is a feature that projects #, but in Halkomelem it is an adjunct to $\sqrt{\text{root}}$.

The next immediate questions one may ask are (i) whether in inflectional languages the feature Number does necessarily project the functional category Number (we have already discussed some arguments against this hypothesis), and (ii) whether the two remaining positions in (32b) that Wiltschko does not discuss, namely D and *n*, can also be modified by a plural feature.

On our understanding Dobrovie-Sorin (2012) introduces such a syntactic microparameter, in the sense that she postulates that Number should not be considered a syntactic category (the head of NumP), but a feature that attaches to some other syntactic category: in Romance Num attaches to D, while in English it attaches to *n*.²²

In our analysis of Romance languages (which could be extended to other defective inflectional languages such as English and Romance based creole languages), given the fact that Number is neither obligatory for definite kinds nor for bare nominals in object of *have*-predicates, we postulate (i) that Number is an optional morphosyntactic feature that does not project NumP, (ii) that this Number feature can adjoin to D or to *n/a*,²³ (iii) that Number can have distinct morphophonological realizations (sigmatic or non-sigmatic), and (iv) that Number can trigger two distinct interpretations: when adjoined to D it turns an entity (a kind) into another type of entity (an object, either a set/sum of atoms if +PL, or an atom if -PL), whereas when adjoined to *n/a* it turns a property (the denotation of the noun/adjective) into another type of property (a property of objects, either a property of atoms if -PL, or a property of sets/sums of atoms if +PL).

To sum up, the microparameter postulated in this paper attaches the morphosyntactic Number feature, which we call PLURALIZER, either to D or to *n/a* depending on the choice made by different inflectional

²¹ In order to make that case, the author presents several properties of plural marking in Halkomelem that English does not have. First, in English, plural marking is obligatory and triggers agreement within the DP. In Halkomelem, however, plural marking on the noun is not obligatory, and the presence of a plural determiner does not necessarily trigger agreement. Additionally, plural markers may occur inside derivational morphology and compound nouns in Halkomelem, but not in English.

²² Interestingly, Dobrovie-Sorin conceives Number in an inflectional language like English as a feature attached to *n*. The lack of Gender features on *n* in this language is postulated as the reason why Number attaches to *n*: it is a means of identifying the content of *n*.

²³ Actually, a nominal expression may even show both plural markers, as illustrated in the Brazilian Portuguese *os coraçõezinho(s)* 'the little hearts'. We will come back to this example below.

languages (Dobrovie-Sorin 2012). This microparameter is the outcome of historical development (Mathieu 2009, 2014; see also Section 4.2 below). Semantically, the feature Number conceived as a Realization relation (cf. Carlson 1977, Borik & Espinal 2015), either imposes a restriction on the meaning of the definite article (the iota operator) by guaranteeing an instantiation of kinds into individuals, or it imposes a restriction on the meaning of the nominal/adjective by guaranteeing a shift from properties to properties.

In what follows we apply this proposal to our Romance data. We hereby defend that in these languages the plural marking is an adjunct. By default, the PLURALIZER merges as a modifier of D (i.e., a categorized *d* root), but in marked cases the PLURALIZER merges as a modifier of N (i.e., a categorized *n* root) or even as a modifier of A (i.e., a categorized *a* root). Thus, we provide arguments for the two remaining possibilities depicted in the structure in (32b).

4. Our analysis of the Romance data

In Section 4.1 we provide an analysis of what we consider to be unmarked cases, while in Section 4.2 we explore an analysis of marked cases.

4.1. Unmarked cases

We would like to put forward the hypothesis that in Romance the PLURALIZER is a modifier of D (or, alternatively, a modifier of a [$\sqrt{\text{root}} + d$], as will be illustrated in (42) below).²⁴



This means that, in the default case, plural marking, i.e. +PL realization of the Number feature – the PLURALIZER, is a syntactic adjunct to D, spelled out on the D head and realized by Vocabulary Insertion as sigmatic plural *-s* in languages such as Brazilian Portuguese and Spanish, or as non-sigmatic (vocalic) plural in other Romance languages such as French, Maritime Provençal, Occitan and some Northern-Italian dialects. Note that in (33), since the PLURALIZER is merged as an adjunct, it is syntactically opaque; hence, the newly formed object has the same label as its host (D).

This proposal can account for all the data we saw in Section 2, where the plural marking is morphosyntactically encoded on the determiner and

²⁴ See also Butler (2012) for the proposal of a DP-adjoined plural in Yucatec Maya.

is responsible for the semantic plurality of the whole DP. Consider the data in (34), repeated from Section 2.

- (34) a. *os livros / os livro / *o*
 the.PL book.PL the.PL book.SG the.SG
livros Brazilian Portuguese
 book.PL
 ‘the books’
- b. *mes deux filles* French (Pomino 2012:203, ex. (1c))
 [me dø fij]
 my.PL two girl.F.SG
 ‘my two girls’
- c. *l-i siès*
 the.PL six
fih-o Maritime Provençal (Pomino 2012:203, ex. (1a))
 girl.F.SG
 ‘the six girls’
- d. *dès mâ²⁵*
 a.PL evil.SG
 ‘the evils’
 Walloon (adapted from Bernstein 1991:107, ex. (12b))

Following this syntactic analysis, according to which the PLURALIZER is a modifying feature on D, we hold that at the first stage of the mapping from syntax to phonology (Nevins 2012) the hierarchical structure and the c-command relationships that hold between D and the complement of D are relevant,²⁶ and account for the left-to-right direction of overt morphophonological agreement (or concord) among the constituents within the same Spell-out domain (see the data in Section 2 and Pomino 2012:208, table 1). Note that this structural relationship predicts a specific linearization of syntactic terminals within the Spell-Out domain,²⁷ which in turn is distinct from Allomorph selection (i.e., Vocabulary Insertion), the fourth stage in the mapping from syntax to phonology (Nevins 2012). Thus, (overt) morphophonological agreement must be conceived as being different from Agree (Chomsky 2000, 2001), which is a syntactic operation consisting on the valuation of a previously

²⁵ All the data considered in this paper contain definite articles and demonstratives. This is the first example with an indefinite article. We are aware of the fact that this is an issue we should address in the future, for in Creole languages there is a difference with respect to the definiteness vs. indefiniteness of the article: no plural marking whatsoever appears when the determiner is indefinite. We thank V. Déprez (p.c.) for this comment.

²⁶ Relevance of a c-command relationship at PF is expected from the fact that the constituents within the same Spell-out domain (the DP phase) are hierarchically organized. Furthermore, note that a c-command relationship has been argued to be relevant at LF to account for scope relationships.

²⁷ We assume that linearization is guided by c-command (Kayne 1994).

unvalued feature (Probe) by a valued feature of the same kind (Goal). See Section 3.1 above.

As a way of illustration recall that in languages such as standard Spanish (as well as in standard Catalan, Italian and Romanian), all the constituents within the DP must show overt exponence of the plural marker at the time of Vocabulary Insertion. See, as a way of illustration, the data in (35).

- (35) a. las camisas blancas Spanish
 the.PL shirt.PL white.PL
 ‘the white shirts’
 b. *las camisas blanca
 the.PL shirt.PL white
 c. *las camisa blanca
 the.PL shirt white
 d. *las camisa blancas
 the.PL shirt white.PL

However, partial plural agreement is also possible in some Romance languages such as Brazilian Portuguese. Consider the examples in (36), repeated from Section 2.

- (36) a. As meninas bonitas. Brazilian Portuguese
 the.PL girl.PL pretty.PL
 b. As meninas bonita.
 the.PL girl.PL pretty
 c. As menina bonita.
 the.PL girl pretty
 ‘The pretty girls.’
 d. *As menina bonitas.
 the.PL girl pretty.PL

The data in (35) and (36) can be accounted for as follows: (i) the PLURALIZER is adjoined to D at syntax, and (ii) all the constituents within the DP that D c-commands at the first stage of the mapping from syntax to phonology may show a realization of the plural marker by Vocabulary Insertion at PF. Morphophonological agreement can take place within the complements of D, but certain restrictions also apply, as shown by (36d). That is, morphophonological agreement is ruled out when an intervener appears: a noun with no morphological expression of plural linearized in between an article and an adjective that show plural exponence. To our knowledge this sort of restriction also applies to all the data we have encountered from Brazilian Portuguese, French, Walloon, Lunigiana, Afro-Bolivian Spanish, and Creole languages. Accordingly, we postulate that the constraint in (37) guides the post-syntactic morphophonological agreement process.

(37) *Plural-marking-on-D constraint*

If X (that is, a pluralized D) c-commands Y (that is, N or A), which in its turn c-commands Z (N or A), plural marking may be overt on X alone, on X-Y, on X-Y-Z, but not on X-Z.

This constraint that bans examples such as (36d) predicts that if D is inflected for number (by adjunction of a PLURALIZER), all the constituents within the DP that D c-commands may (in some languages, like Brazilian Portuguese) / must (in others, like standard Spanish) instantiate also a plural marker. Accordingly, we predict that the PLURALIZER adjoined, by default, to the functional category D, can be morphophonologically instantiated by different means. Morphophonological agreement on all the constituents within the same DP Spell-out domain may be obligatory or optional, depending on the language, as we have seen in (35) and (36). However, (37) must apply: within the same phase domain, the postsyntactic operation of agreement/concord does not tolerate the presence of a dissimilar intervener. Constraint (37), then, prevents the appearance of a dissimilar element (for example, a non-agreeing noun appearing between the pluralized determiner and the agreeing adjective in (36d)).²⁸

Let us now consider how our proposal is able to explain the case of complex determiners formed by an article and a possessive. Consider the Brazilian Portuguese paradigm in (38), with the meaning ‘my daughters’, and the parallel data from Lunigiana dialects in (39) (Cavirani 2018).²⁹

- (38) a. (as) minhas filhas
 the.PL my.PL daughter.PL
 b. (as) minhas filha
 the.PL my.PL daughter
 c. (a) minhas filha
 the my.PL daughter
 d. ??as minha filha
 the.PL my daughter

- (39) a. [ʎa 'nɔʃtrja 'ka] Colonnatese
 Art.PL.F POSS.PL.F N.F
 ‘our houses’

²⁸ In a way, the constraint in (37) is the counterpart of a kind of haplology that operates after the linearization stage of the mapping from syntax to exponence (Nevins 2012). In the latter, the appearance of an intervener repairs or preempts the occurrence of linearized identical elements. This type of post-syntactic restrictions can be understood as morphophonological constraints that optimize grammars by excluding redundancy in a principled way.

²⁹ Interestingly, note that in the examples in (39) the plural marking is merged with the article or the possessor stem previous to the feminine morpheme suffix.

- b. [la 'nɔstrja 'skarpa] Bagnonese
 Art.F POSS.PL.F N.F
 'our shoes'
- c. [ja 'nɔstra so'rela] Filattierese
 Art.PL.F POSS.F N.F
 'our sisters'

In order to account for these data, we consider that in a D-Poss complex unit (Despić 2015) there is variation on whether the possessor or the article is the head, and therefore the constituent to which the PLURALIZER is adjoined. If the real Determiner is the possessor (like in English), the article may be omitted or may even not show plural marking, as illustrated in (38a,b,c), for which we postulate the structure in (40a) that locates the article is in Spec,PossP. Post-syntactic concord between the pluralized possessor and the article may account for examples (38a,b). If this post-syntactic concord operation does not take place, (38c) is expected to be instantiated. Alternatively, if the head of the D-Poss complex unit is the D, the PLURALIZER is expected to adjoin to D, and this accounts for the sequence in (38d), which is considered to be well-formed for some speakers and whose structure is given in (40b).

- (40) a. [_{POSSP} [_{DP} [_D a]] [_{POSS} PLURALIZER [_{POSS} minha]] [_{NP} [_N filha]]]
 b. [_{DP} [_D PLURALIZER [_D a]] [_{POSSP} [_{POSS} minha]] [_{NP} [_N filha]]]]

We would advance a similar solution to explain the variation observed in (39). The examples in (39a,b) would have a structure parallel to (40a) with optional post-syntactic morphophonological concord, whereas the example in (39c) would have a structure parallel to (40b).

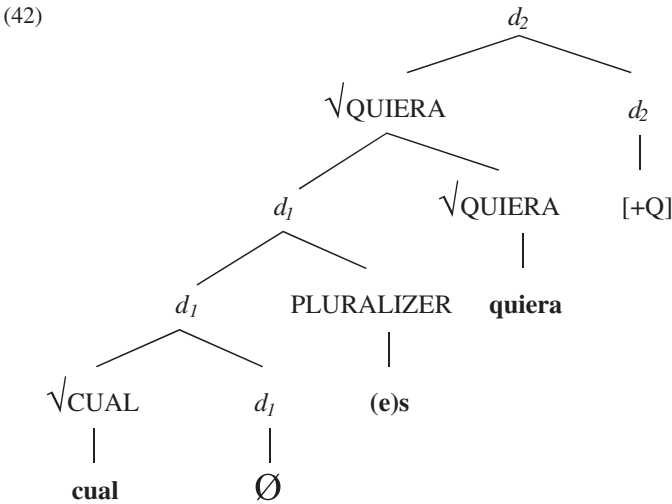
Among the set of unmarked cases, it should be noted that the PLURALIZER may also modify some compound determiners in languages like Spanish and Portuguese, thus providing additional support for our hypothesis that plural is a syntactic adjunct on D in Romance. In this respect, we see a striking similarity with Halkomelem's property of plural marking inside compounds pointed out by Wiltschko (2008:644). Consider (41).

- (41) a. *quaisquer* Brazilian Portuguese
 which.PL.want
- b. *cualesquiera* Spanish
 which.PL.want
 'whichever'

The two determiners in (41) corresponding to 'which' show the plural marking inside the compound, and provide good evidence for our proposal.

Following Harley's (2009) analysis of compounds, we assume that at the input structure for the Spanish complex D *cualesquiera* the root

$\sqrt{\text{CUAL}}$ is merged in complement position of a d functional head, and the dP it projects appears in object position of the root $\sqrt{\text{QUIERA}}$. Head movement of $\sqrt{\text{CUAL}}$ into d_I , subsequently modified by the PLURALIZER, and later incorporated into the root $\sqrt{\text{QUIERA}}$ derives the complex head [[[$\sqrt{\text{CUAL}}$] d_I] PLURALIZER] $\sqrt{\text{QUIERA}}$], which later merges with a categorizing (quantifier-flavored) d_2 , and head moves into it, creating the complex head [[[[$\sqrt{\text{CUAL}}$] d_I] PLURALIZER] $\sqrt{\text{QUIERA}}$] d_2]. This complex head is finally realized by Vocabulary Insertion as *cualesquiera*. The output structure of these operations is represented in (42).



Further support for this analysis comes from Walloon (Bernstein 1991, Bouchard 2002). This is a language where a phonetically realized plural suffix is never found on the noun, but plural marking appears on the article. This suggests that Walloon, like French, follows what we consider to be the unmarked paradigm, with plural marking on D. But, Walloon has been characterized by having, in addition to syntactic plural marking on D, a feminine plural marker *ès* which co-occurs with pronominal adjectives (Bernstein 1991:108). Consider the examples in (43).

- (43) a. les belès feyes³⁰
 the.F.PL pretty.F.PL girl
 'the pretty girls'
 b. dès neûrè-z- amonnes
 some black.F.PL berry
 'some black berries'

³⁰ According to Bernstein (1991:107) "Walloon nouns (...) are never syntactically marked for number, (...). The plural affix that appears in the written language, then, is purely an orthographic convention."

Interestingly, this feminine plural marker is claimed to be not an adjectival marker but a nominal marker, and furthermore, in the case of coordinated adjectives, it is limited to the last adjective in the coordination.³¹ If *ès* were enclitic on the adjective it would bear stress (Bernstein 1991:112).

- (44) *dès bèles èt bounès biesses*
 some pretty and good.F.PL animal
 ‘some nice and good animals’

Our analysis of the Walloon data relies on the hypothesis that the PLURALIZER, syntactically speaking, is a modifying feature on D. Overt exponence of the plural marker *ès*, proclitic to the noun, is conceived as the output of prosodic phrasing (cf. stage 2 in the mapping from syntax to phonology, Nevins 2012).

To close this section we would like to remark that the hypothesis defended in this section (i.e., the PLURALIZER being considered a modifier/adjunct of D or, alternatively, a modifier of a [$\sqrt{\text{root} + d}$] structure, as in (42)) can also account for the order of possessors and genitives that originally motivated a NumP functional category in Catalan (Picallo 1991). As seen above, in order to explain the fact that in Catalan possessive adjectives can follow the article and precede a nominal head, the author assumes Kayne (1975), for whom the possessive moves to a prenominal position. Picallo proposes that the possessor moves to the specifier of NumP, where it is placed between the D and the N. In our account, we assume a complex DP for possessive constructions (Despić 2015), where the possessor is the complement of D. In Catalan, the head of this D-Poss complex unit is D, and the PLURALIZER is adjoined to D, as illustrated in (45).

- (45) [_{DP} [_D PLURALIZER [_D la]] [_{PossP} [_{Poss} seva] [_{NP} [_N novel·la]]]]

Post-syntactic morphophonological agreement between D and the c-commanded complement of D would lead to *les seves novel·les de Nabokov* lit. the.PL {his, her, their} novels of Nabokov ‘{his, her, their} novels of Nabokov’.

In Section 4.2 we focus on marked cases of plural marking.

4.2. *Marked cases*

Recall that, following original ideas by Bouchard (2002) and Dobrovie-Sorin (2012), we have postulated a microparameter according to which in

³¹ It should be noted that Bernstein (1991) assumes a functional head Num, whose head is *ès*, in order to explain these data. Additionally, she assumes that the plural morpheme *ès* is proclitic to the noun but affixed to the adjective.

some inflectional languages (such as Romance ones) the PLURALIZER adjoins to D/*d*, while in other inflectional languages (such as English) the PLURALIZER adjoins to *n*. However, within a given inflectional language it is not impossible to find cases that seem to resort to the unexpected value of the parameter (e.g., *these, those* vs. *the* in English). We now turn to marked cases in Romance, where the PLURALIZER modifies the N (or the categorized *n*), as represented in (46).



A first group of data that support this proposal comes from compounds. Consider the examples in (47) and (48), which all illustrate the existence of plural markers inside compounds.

(47) a. *mals de cap* Catalan
ache.PL of head
‘headaches’

b. *trenes bala* Spanish
train.PL bullet
‘bullet trains’

(48) a. *coração* Brazilian Portuguese
heart
‘heart’

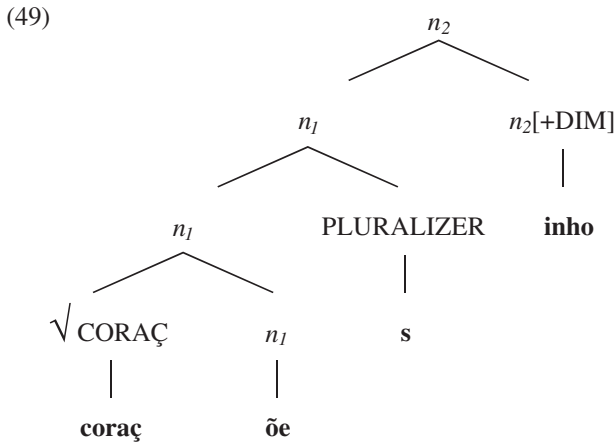
b. *corações*
heart.PL
‘hearts’

c. *coraçõzinho*
heart.DIM
‘small heart’

d. *coraçõezinho(s)*
heart.PL.DIM.PL
‘small hearts’

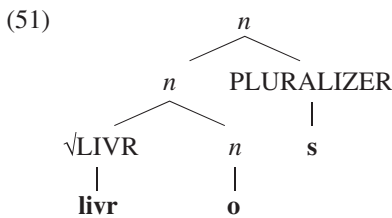
Thus, for cases such as Brazilian Portuguese *coraçõezinho(s)* ‘little hearts’, we postulate the following derivation: $\sqrt{\text{CORAÇÃO}}$ is first categorized as a noun by n_1 , subsequently pluralized and finally turned into a diminutive form by n_2 , the nominalizer *-inho*. Considering the diminutive affix as part of compounding, we propose that the

PLURALIZER modifies the noun, before the compound is formed.³² See the structure in (49).



A parallel analysis can explain the Brazilian Portuguese acquisition data in (50a) and the marked North Eastern Central Catalan example in (50b). The proposed structure for the former example is represented in (51).

- (50) a. o livros Brazilian Portuguese (child data, Lopes 2006)
 the book.PL
 ‘the books’
 b. aquell llibres NEC Catalan (Bonet et al 2015:4, ex. (7c))
 that book.PL
 ‘those books’

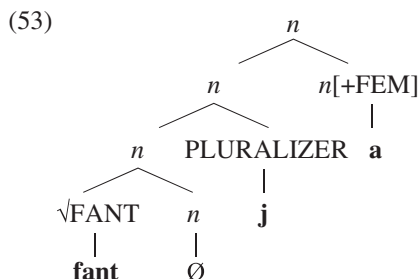


Similarly, the proposed analysis seems to be the relevant one to account for the Amegliese data in (52a), as well as the Villafranchese and Mulazzese

³² It is relevant to point out that a nominal expression may show two plural markers: the modifier of n and the modifier of the article, as illustrated in the Brazilian Portuguese *os coraçõezinho(s)* lit. the.PL heart.PL.DIM.PL ‘the little hearts’, which coexists with *os coraçõezinho(s)* lit. the.PL heart.DIM.PL. If the modifying feature doubles, we suggest that Number encodes two distinct interpretations: the modifying feature on n turns properties of kinds (the denotation of the noun) into properties of objects before the compound diminutive is formed by n_2 . Reference to entities is ensured by the iota operator corresponding to the definite article, and the modifying feature on d restricts that reference to the set of all pluralities of atoms.

data in (52b,c). Note that, crucially, in all these examples the determiner does not show plural marking, the plural marker is overt only on the noun and linearized between root and the feminine suffix (Pomino 2012, Cavarani 2018). This supports the hypothesis that in such marked cases the PLURALIZER is a modifier of *n*, as represented in (53) for the noun *fantja* ‘girls’.

- (52) a. a fantja Amegliese (Cavarani 2018)
the girl.PL.F
‘the girls’
- b. la skarpja nova Villafranchese (Pomino 2012)
the.F shoe.PL.F new.F
‘the new shoes’
- c. kla donja granda Mulazzese (Pomino 2012)
DEM.F woman.PL.F new.F
‘these big women’



In this paper, we assume that these cases are marked because they are restricted to some varieties/languages and/or to certain structures. We suspect that these marked cases might be the effect of how each language/variety underwent the diachronic change from Latin to Romance when the DP level was introduced (Mathieu 2009, Ledgeway 2012, among others). In fact, it might be the case that in this specific language change (that is, from a non-DP to a DP language), some old forms might have been maintained since they were not robust in the data for the children to overgeneralize the new pattern. Hence, in some varieties/languages the plural was kept on the *n/a*, keeping the Latin pattern, even though a *D* had arisen in the language (on this variation, see below). Moreover, this state of affairs is marked because it affects only feminine nouns.³³

³³ Thus, Cappellaro (2018:7) points out that the asymmetric developments of the so-called “lazy agreement” (Haiman & Benincà 1992, Rasom 2008, a.o.), where number is not overtly marked on all elements of a NP if the N is feminine plural, are linked to a characteristic “asymmetrical morphological development of masculine and feminine plurals from Latin nominative and accusative case-forms. In particular, the fact that feminine nouns continue plural forms in -Vs, a segment that would be later susceptible to deletion, while masculine plurals continue the nominative case-form -i”. Cappellaro proposes that “lazy agreement” is a reaction to “gender overtization”; on her understanding there was a “diachronic emergence of a biunique alignment between inflectional ending and gender value”.

Note that the problematic examples presented in this section (i) all involve feminine nouns; (ii) the plural marking is a suffix that is attached to a lexical category and linearized before the feminine suffix; and (iii) the D (either the article or the demonstrative) does not show plural marking. We take these three facts as evidence that they are marked cases, which – according to what has been assumed in this section – means that the PLURALIZER is a modifier of a lexical category N/A (or categorized root *n/a*). The prediction is that the number feature modifies *n/a*. Therefore, it restricts the meaning of the noun/adjective to properties of individuals.³⁵

Accordingly, we put forward an analysis of the pronominal adjectives in (55) similar to the one postulated in (53), with the only difference that in this case the PLURALIZER is adjoined to *a*.³⁶ Optional morphophonological agreement at Spell-Out, based on c-command, explains that at the time of Vocabulary Insertion only the adjective or both the adjective and the noun show exponence of a plural marker.

To sum up, in this section we have addressed the derivation of canonical plural agreement within the nominal domain by postulating a modifying PLURALIZER feature, adjoined to D (or a categorized *d* root). We have argued that at a post-syntactic linearization level from syntax to phonology an operation of c-command is relevant to explain the directionality of plural agreement. This operation is complemented by a Plural-marking-on-D constraint that stops the presence of a dissimilar intervener. Finally, non-canonical agreement within the nominal domain in Romance has been analyzed by postulating that in some marked cases Number is a modifying feature on lexical categories *n/a*.³⁷

³⁵ This prediction is somehow expected if we just consider data from a defective inflectional language like English. According to native speakers of English there is a difference in interpretation between *the crazy* and *the crazies*, a pluralized adjective: the former refers to the (maximal set of) people (in a particular context) that have the property of being crazy, while the latter refers to the (maximal set of) specific individuals (in a particular context) that are identified by having the property of being crazy.

See McNally & de Swart (2015) for a semantic analysis of plural adjectives in Dutch.

³⁶ This proposal can also explain the lazy agreement data from Fassano (Rasom 2008), where plural is only marked on the postnominal adjective, yielding a restrictive reading (i):

(i) la cèsa pìcoles
 the.F.SG house.F.SG. small.G.PL
 ‘the small house’ (= the house that is small)

In this case, we assume again that it is the *a* the category that is modified by the PLURALIZER, and, following Cinque (2010), since it has a restrictive reading, this adjective is in a reduced relative clause located in the specifier of a first functional projection related to adjectives inside the DP. The noun moves over the adjective (details left aside here) and the final order is obtained:

(ii) [DP [D la] [NP cèsa_i [FP_i pìcoles . . . [NP t_i]]]]

³⁷ Note that the possibility of a having a PLURALIZER adjoined at different positions within a nominal domain is parallel to the way certain tenses (e.g., the past perfect: a PAST before a PAST) can be analyzed in the sentential domain.

5. Conclusion

In this paper we have first presented a set of puzzling data concerning plural marking in Romance. Overall these data challenge the standard view that Number is syntactically encoded and semantically interpreted on the Noun. All the data here described suggest that, by default, Number is encoded on the Determiner not only in French and Brazilian Portuguese, but also in other Romance languages, both in standard and non-standard varieties.

We have argued that NumP, as a category, is not required in Romance and that, syntactically, the PLURALIZER is encoded as a syntactic feature adjoined to D (i.e., a categorized *d*), in unmarked cases, and to N/A (i.e., a categorized *n/a*), in marked cases. Thus, we provide support for two of the positions in the diagram in (32b) that were left unexplored in Wiltschko (2008). Instantiations of plural marking on other constituents within the nominal domain are understood as the output of post-syntactic morphophonological concord, which relies on c-command and on the Plural-marking-on-D constraint in (37) at the first stage of the mapping from syntax to phonology (linearization) but not at the last stage (vocabulary insertion). Marked forms are considered the vestige of the diachronic development from Latin to Romance from a non-DP language to DP languages.

We acknowledge that the proposal discussed in this paper raises new questions that are open to debate. One such question is the issue of what is the semantic difference between having a PLURALIZER as an adjunct to D or as an adjunct to N/A. We have explored the idea that applying the PLURALIZER on N/A would turn properties into properties of individual objects, whereas applying the PLURALIZER on D would turn kind entities into object entities. Support for this hypothesis came from the observation that there are lexical items that show two plural markers, one inside compounds and an additional one on D.

Notwithstanding these open questions, we believe we have advanced an innovative way of analyzing the diversity of number marking in Romance that has been pointed out in several previous studies.

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