Nouns in apposition: Portuguese data

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ABSTRACT. The nature of N1N2 constructions, or nouns in apposition, is controversial: depending on the theoretical framework, they can be considered as compounds or as syntactic constructions.

Indeed, nouns in apposition function as a hybrid category, in a double way:

(i) the same lexical structure in apposition is viewed either as a coordinative construction, as a subordinative or as an attributive construction.

(ii) N2 functions as a modifier or as an attributive item of N1; in Portuguese, when plural is syntactically mandatory, N1 (the head) is systematically pluralized; N2 either rejects inflection or behaves as a predicator, allowing inflectional marks.

We claim that Romance NN behave as a specific type of compounds. This assumption is grounded on their behaviour by contrast with phrasal properties.

Portuguese compounds are characterized by a narrow relationship between internal structure, headedness and inflectional patterns. In Portuguese, by default, the head of compound is inflected. NN related by an attributive semantic link are nowadays particularly unstable and problematic regarding inflection. Inflectional variation — widely attested — helps in determining the status of NN in apposition: as two inflectional patterns are available, we must verify if they correspond to two different constructions or to one structure with two readings. The analysis addressed is supported by empirical data of contemporary Portuguese language extracted from Brazilian and European databases, and requires the theoretical articulation of a double predicative class of N2 (holistic and partitive) with inflectional fluctuation of attributive N2 in the second situation: performing a continuum, double inflection is close to holistic predication and single inflection (of N1) is close to partitive predication; systematic double inflection is close to coordination and inflectional oscillation is close to attribution. The predicative power of nouns in apposition supports their partitive and their holistic reading. Inflectional fluctuation of N2 illustrate in an optimistic way their hybrid nature.

KEY-WORDS. lexicon, morphology, composition, apposition, Portuguese Language, Romance Languages

1.   Introduction

Appositions are defined as «constructions in which either a noun phrase or a noun modifies the head of another noun phrase» (Kornfeld 2003: 212). This definition is neutral regarding the problems arising from such a concept, which poses interesting issues to the interface between Lexicon, Morphology and Syntax.

Nouns in apposition function as a hybrid category, in a double way:

(i). N2 functions as a modifier or as an attributive item of N1; when plural is syntactically mandatory, Portuguese N1 is systematically pluralized; N2 either rejects inflection or allows inflectional marks;

(ii).the same NN lexical structure is seen as a coordinative, as an attributive or even as a subordinate construction[1]. The variation in the inflectional patterns supports this oscillation.

The nature of NN constructions is controversial: they are considered either as compounds, mainly by lexicalist positions (Bisetto & Scalise 1999; Ribeiro 2010; Rio-Torto & Ribeiro 2012), or as syntactic constructions (nominal phrases), as supported by syntactic approaches (Kornfeld 2003 & Fábregas 2005). Di Sciullo & Williams (1987) consider compounding in English as a morphological process, and Lieber (1992) and Baker (1995) defend its syntactic nature.

Portuguese compounds are characterized by a narrow relationship between internal constituency, headness and inflectional patterns. In Romance languages NN compounds admit internal inflection (cf. plural morpheme -**s**), mandatory in N1 (*navio**s**-escola* 'lit. ship**s**-school') and sometimes also in N2: *couve**s**-flore**s*** 'cauliflowers' (cf. Cunha & Cintra 1985: 188). This internal inflection stresses their proximity with phrasal constructions.

In Portuguese, with the exception of NN structures, all types of compounds are regular according plural patterns: by default, the head of

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[1] Spanish NN constructions illustrate this heterogenity: *artículos-viaje* 'lit. articles-travel' are described as subordinate compound (Guevara 2012), *hombres-rana*(**s**) 'frogmen' as attributive compounds (Rainer 2012), *escuelas-museus* 'schools-museums', *bares restaurantes* 'bars restaurants' as coordinate compounds and *empresas-fantasma* 'ghost companies', *situaciones-límite* 'limit situations', *visitas-relámpago* 'lightning visits' as attributive appositions (Kornfeld 2003).

a compound is inflected (cf. section 4). On the contrary, NN related by an attributive link are nowadays unstable and problematic regarding inflection (cf. section 5.). Inflectional variation highlights the double nature of nouns in apposition: since two inflectional patterns are used, it is crucial to know if they correspond to two different constructions or to one structure with two readings. This goal entails the conciliation between (i) the nature of N2, when it is a predicator, and (ii) the no mandatory agreement (*visitas-relâmpago(s)*) between the nouns. This is the focus of section 6.

2.   The state of the art: issues and assumptions

According to Val Alvaro 1999, there are three classes of nominal appositions: denominative (*rio Tamisa* 'river Thames'); classificative (*uma pintura Renascimento* 'a Renaissance painting'); and attributive (*homem-bomba* 'bomb-man', *situação-limite* 'limit situation', *amarelo-limão* 'lemon yellow', *café-concerto* 'café-concert').

We claim that nouns in apposition are compounds with morphological nature and not syntactic objects. Having a different structure and behavior, nouns in apposition are not prototypical phrases. As syntactic islands, appositions are similar to compounds (cf. section 3.). Two correlated questions must be addressed: is internal inflection compatible with their structural opacity? And is lexical integrity applicable to Romance compounds?

2.1. Theoretical statements

Syntacticist approaches to word formation (cf. Lieber 1992) claim that there are two types of words: (i) derivational or morphological words, built according to word syntax, and (ii) syntax words, generated by sentential syntax. According to this approach, compounds are syntax words. The mechanisms that govern morphological and syntactical objects are the same. Kornfeld (2003:223) states that «Spanish N+N compounds are syntactic words, that is, they derive from a syntactic (and not a morphological) means of word formation. This implies that, in Spanish, compounding is a derived phenomenon related to syntax and lexicon, and not a primitive notion of morphology». VN Romance compounds are perhaps the constructions in which the internal structure reproduces, with adaptations, the patterns of

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prototypical phrases.

Lexicalist approaches state a different nature of lexical and syntactic units, rules and products. Within the lexicalist framework, compounds are plurilexematic units in which meaning refers to a delimited reality, with intensional and ontological identity. Each compound is used as a holistic denomination, and meaning does not always coincide with the parts' sum of meanings. Although plurilexematic, a compound behaves as a single lexical unit, exhibiting syntactic and lexical opacity. As "syntatic islands", compounds are marked by the inaccessibility of their constituents for syntactic rules. But the opacity to syntactic rules of NN compounds has been modulated, in order to account for the specific and scalar behavior of Romance compounds with regards to lexical integrity (Lieber & Scalise 2007).

Despite their nature, NN constructions can be inserted into syntactic structures and behave as listemes (Di Sciullo & Williams 1987), as linguistic expressions memorized and stored as listed objects. Section 3. describes the classes of Portuguese compound in order to situate the relevant features of nominal compounds in apposition.

2.2. Arguments against syntactic nature

This section presents crucial arguments in favor of the non-syntactic nature of nouns in apposition.

As their internal structure shows, NN appositions are not prototypical nominal phrases. As syntactic islands, appositions are similar to compounds. N2 in apposition is never preceded by a determiner. The ungrammaticality of such a sequence is systematic.

The canonical functional projections of nominal phrases are: [DP [QP [AgrP [NP]]].

NN in apposition can agree in number with the nominal head they modify, but never admit QPs or DPs:

(1) Este$_{DP}$ abre-latas vs. *abre as$_{DP}$ latas, *abre estas$_{DP}$ latas, *abre muitas$_{QP}$ latas

'This can-opener' vs. '*opens the$_{DP}$ cans', '*open these$_{DP}$ cans', '*open many$_{QP}$ cans'

In opposition to phrases, compounds are opaque to internal syntactic operations: the constituents cannot be displaced (cf. 2-3), elided and anaphorically resetted (cf. 4), or coordinated (cf. 5):

(2) *biocombustível* 'the biofuel' vs. *o combustível-bio* '*the fuel-bio'

(3) este *saca-rolhas* 'lit. this opener stoppers´ vs. este *rolhas-saca* 'lit. this stoppers opener'

(4) *este *saca-rolhas* é bom e saca-as bem '*this opens stoppers is good and opens them well'

(5) *este *saca-rolhas* e tampas, lit.'*this open stoppers and lids'

This kind of NN does not allow modifications (cf. 6) or complementations (cf. 7) with scope on one of the nouns. By contrast with (6), «Este *saca-rolhinhas*», with -*inh*-, a diminutive suffix, is accepted if interpreted as 'this little stopper opener'.

(6) *este *saca-rolhinhas* '(-*inh*-: a diminutive suffix) *lit. this open little stoppers'

(7) este *saca-rolhas* [*de cortiça*]$_{PP}$ 'lit. this stopper opener [of cork]$_{PP}$' (or cork stoppers, not plastic stoppers, for instance) vs. *este *saca* [*rolhas* [*de cortiça*]$_{PP}$]$_{OD}$ 'lit. this open [stoppers of cork]

The structures analyzed are similar to other morphological constructions and to prototypical compounds in that they follow the 'Lexical Integrity Principle': the insertion of lexical items in the interior of this structure is mainly avoided, and any internal intrusion from syntactic procedures (elision, coordination, movement) is forbidden. [NN] in apposition (as well as [NA] or [N Prep. N]) have an internal structure which is not accessible to syntax, and that is clear by the impossibility of modifying only one of the nouns. By contrast with (6), «Este *saca-rolhinhas*», with -*inh*-, a diminutive suffix, is accepted if interpreted as 'this little cork opener'.

As we will observe (cf. section 6.1.), the fact that some NN compounds allow internal inflection does not deny the 'Lexical Integrity Principle' parameterized for Romance languages.

3. Classes of compounds

According to the morphological nature of their constituents, NN compounds can be divided into two groups: (i) single phonological words, also known as 'morphological' or neoclassical compounds; and (ii) double phonological words or 'morphosyntactic' compounds[2]. The first class includes roots, the other, words.

As far as the grammatical linking between the constituents of compounds is concerned, they are organized into three groups: subordinated, coordinated and attributive compounds.

The units of coordinate compounds are linked by a copulative operator, explicit (*whisky-and-soda, pepper-and-salt*) or not (*surdo-mudo* 'deaf dumb'). The relationship between the two units, both heads of the construction, is symmetrical and additive. Both words share head-like characteristics.

We can distinguish appositional compounds, such as Eng. *maidservant* or *trabalhador-estudante* 'worker and student', hyponyms of both *maid* and *servant* or 'worker and student' and copulative compounds (also called *dvanda* in the Sanskrit tradition), as *Boznia-Herzgovina*, (train) *Lisboa-Porto* 'Lisbon-Oporto'. In these cases the compound is not an hyponym of either element, but the elements denote separate entities which combine to form a denomination of a new entity related to them.

Coordination, in compounding as well as in syntax, requires that both units belong to the same grammatical label. The major template is [NN]$_N$: *ator-autor* 'actor-author', *norte-sul* 'north-south', *trabalhador-estudante* 'worker-student'.

In subordinate type the relation between the two constituents is a complement relation — a predicator-argument relation, a relation of implicit syntactic dependency —, namely a subordinative one, as [VN$_{OD}$]$_N$ pt. *salva-vidas* 'life-gard', eng. *pickpocket,* eng. *taxi driver* show. The non-head (*vidas*, *pocket*, *taxi*), being a complement of the (de)verbal head (*salva, pick, driver*), is conceived, in LCS (Lexical Conceptual Structure), as a Thing (cf.

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[2] As Rio-Torto & Ribeiro (2012) show, the duality 'morphological' vs. 'morphosyntactic' is not the most adequate to the compound data of Portuguese language. This dichotomy has been proposed by Di Sciullo & Williams (1997), to whom morphological objects include morphemes, roots, stems and compounds, and non morphological objects, such as VN, VA, VAdv, are phrasal structures. Structures like *database, weekend* would be syntactic products, reanalyzed and recategorized as words that can occupy a nuclear position (X⁰) in syntax. In fact, these two classes are better described as 'single phonological words' and 'double phonological words'. Note that in Romance languages the absence of internal inflection would prove that VN nouns are compounds (not phrases) and that phonological words such as *database* or *weekend* might be also considered as compounds.

Jackendoff 1990).

In modificative or attributive type the constituents are not linked by a dependency relationship: the non-head modifies and delimits the intension of the head, or specifies an attribute of the head's body. The parts of the compound are linked by a modifier-modified or a modified-modifier relation. The non-head may be adjectival (*bomba atómica* 'atomic bomb'), nominal (*palavra-chave* 'key-word') or a prepositional phrase (*cartão de crédito* [lit. card of credit]). In LCS terms (Jackendoff 1990: 43-58) the modifier is interpreted as a Property and not as a Thing.

Compounds based on coordinate, subordinate and attributive internal relations are identified on both 'morphological' and 'morphosyntactic' compounds (cf. Table 1).

TABLE 1 – Compounds' internal constituency and grammatical relations

	Coordinate	Subordinate	Attributive
One phonological word 'Morphological' compound	[*agridoce*]$_A$ 'bittersweet'	[*herbicida*]$_N$ 'herbicide'	[*neurocirurgia*]$_A$ 'neurosurgery'
Two phonological words 'Morphosyntactic' compound	[*poeta-pintor*]$_N$ 'poet-painter'	[*beija-mão*]$_N$ (kiss hand) 'hand kissing'	[*palavra-chave*]$_N$ (word key) 'key-word'

4.   [NN]: inflectional patterns

In Romance languages the head and the grammatical relations between the constituents play a crucial role on compound inflection.

4.1. Portuguese

In Portuguese there is an indelible relation between inflection and head. Nevertheless, this is not the only dimension that rules compound inflection. Other criteria are activated, such as stress structure, morphological nature of the constituents or grammatical relations between them.

Portuguese compounds may be divided into three classes, according to the presence of inflection at the right border of the hole compound (pattern 2), at the head (pattern 3), or its external occurrence (pattern 1). In

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Portuguese, plural is primarily codified by the adjunction of -*s* to a nominal/ adjectival form or to a determiner.

Pattern 1. [Det$_{\text{INFLECTION}}$ [XY]$_N$]$_N$: exocentric compounds
Exocentric compounds in whose internal structure a V occurs do not allow internal inflection. It is the determiner that expresses the plural.
i) [VN]$_N$: *o(s) lava-louça* (wash tablewear)'dishwasher'
ii) [VAdv]$_{N/A}$: *o(s) fala-barato* (speak cheap)'gasbag(s)'

Pattern 2. [[X][Y$_{\text{INFLECTION}}$]]$_N$: inflection on the right constituent with scope on the whole
When the compound is a single phonological word (univerbation), inflection is mandatory at the end of it, as coordinate *sinojaponês(es)* 'sinojapanese', subordinate *herbicida(s)* 'herbicide' and attributive *hidromassagen(s)* 'hydromassage' illustrate.
This group also includes compounds formed by neoclassical roots, such as *anglófilo(s)* 'Anglophile(s)', *carnívoro(s)* 'carnivorous', and agglutinated compounds such as *aguardente(s)* 'brandy(ies)', *artimanha(s)* 'trick(s)'.

Pattern 3. Head inflection: single manifestation [X$_{\text{INFLECTION}}$Y] or double manifestation [X$_{\text{INFLECTION}}$ Y$_{\text{INFLECTION}}$])
The head of the compound is pluralized. Three situations can occur.
(i) [NN]$_N$ in attributive/modifying compounds: *visita(s)-relâmpago* 'lightning-visit(s)'
(ii) [NN]$_N$ coordinate compounds: both heads are inflected: *médico(s)-escritor(es)* 'doctor(s)-writer(s)'; *surdo(s)-mudo(s)* 'deaf(s) and dumb(s)'
(iii) [NA]$_N$ or [AN]$_N$ head inflection and agreement: both constituents are inflected, due to a mandatory agreement between noun and adjective: an example such as *escola(s)$_N$ primária(s)$_A$* (lit. school primary) 'primary school(s)' displays this kind of pattern, in that the head noun is inflected and the adjective agrees in number with it.

In sum, inflection is mainly governed by the head(s): two-inflectional features occur when the compound is double-headed (a scenery restricted to coordinative compounds). When the compound is $[NA]_N$ or $[AN]_N$, inflectional agreement is mandatory between N and A and these compounds also exhibit two inflectional features. NN patterns of inflection require a deep analysis. Table 2 summarizes the inflectional patterns of Portuguese compounds.

TABLE 2 – Internal constituency, grammatical relations and inflectional patterns

Inflectional patterns	Coordination	Attribution	Subordination
(i) exocentricity: $[Det_{INFL} [X\ Y]]$	*o(s) pára-arranca* 'stop/start'	*o/a(s) fala-barato* (speak cheap) 'gasbag'	*o/a(s) sabe-tudo* 'know all'
(ii) morphological compound:$[XY]_{INFL}$	*sinojaponês(es)* 'sino Japanese(s)'	*sul-africano(s)* 'south African(s)'	*herbicida(s)* 'herbicide(s)'
(iii) head inflection	**Coordination**	**Attribution**	
	head inflection	head inflection and agreement	
	poeta(s) -pintor(es) 'poet(s)-painter(s)' *surdo(s)-mudo(s)* 'deaf(s)and dumb(s)'	*fim(s)) de semana* (end(s) of week) 'weekend(s)' *palavra(s) chave* (word(s) key) 'key word(s)' *arma(s) branca(s)* (weapon(s) white(s)) 'sharp weapon(s)' *grande(s) superfície(s)* (big surface(s)) 'shopping center(s) '	

4.2. Spanish

In Spanish the situation is not very different from that of Portuguese. Agreement in NN compounds varies according to the grammatical relations between constituents. The double marking of plural is typical of coordinate compounds (Guevara 2012). Kornfeld (2003: 213) claims that there is no number agreement between the head and N2 in 'classifier appositions' such as *hombres-pájaro* 'lit. men-bird', *carpetas-mochila* 'lit. folders backpack' and in 'attributive' ones (*situaciones-límite* 'lit. situations limit', *visitas-relámpago* 'lit. visits lightening'). In many NN compounds, the plural of N2 can be observed (cf. (s) signalizes plural optionality): *momentos*

claves(s) 'moments-key', *empresas fantasma(s)* 'phantom companies', *situaciones límite(s)* 'limit situations', *visitas relápago(s)* 'lightning visits', *visitas sorpresa(s)* 'surprise visits'. According to Rainer (2012: 378), this fact supports the conversion of N2 into an adjective.

Despite the similarities between nouns and adjectives, their nature (Bosque 1998, Wierzbicka 1986) and their syntactic way of functioning is very different. In the cases mentioned above, we believe that N2 is not converted into an adjective (cf. Martinho, in this book): it is a noun with a predicative functioning, a predicator.

4.3. French

In French NN compounds, agreement varies according to the grammatical relations between the nouns. According to Villoing (2012: 53), «In coordinated and attributive compounds, plurality is marked on both constituents, while in subordinating NN compounds, it is only marked on the first element». Next table contains examples given by the author.

TABLE 3 – Patterns of NN plurality in French

N1[+PL] N2[-PL]	N1[+PL] N2[+PL]	
Subordination	Attribution	Coordination
bébé**s**-éprouvette 'test tube babies' timbre**s**-poste 'postage stamps' pause**s**-café 'coffee breaks'	chou**x**-fleur**s** 'cauliflowers' homme**s**-grenouille**s** 'frogmen' poisson**s**-chat**s** 'catfish'	bar**s**-tabac**s** 'bars-tobacco' boulanger**s**-patissier**s** 'bakers'

When the compound includes a color adjective, this is in principle invariable: *chemise**s** rose-pâle* 'pale pink shirts' (*roses-pâles), *cheveu**x** brun-clair* 'hair light brown' (*bruns-clairs). But, as Villoing also remarks (2012: 54), some variation is admitted: *des cuisine**s** vert-olive* 'kitchens olive green' ou *verte**s**-olives*; *des robe**s** bleu**es**-ciel* 'Blue Sky dresses'.

4.4. Italian

In Italian, NN compounds such as *cap**i**-stazione, nav**i**-traghetto* reveal inflection on the head (cf. **-i-** plural's morpheme). Masini, Scalise (2012: 85) state that this type of compounds «[...] despite having two semantic heads, has just one formal head that is located on the canonical position of the head in Italian, i.e., on the left». Indeed, the formal head *nave* is responsible for the feminine gender of the hole (*traghetto* is masculine).

5.   Inflectional variation in attributive Portuguese NN

Cunha & Cintra 1985: 188, in their reference grammar of Portuguese, assume that the plural of NN compound occurs at least in N1 (*navio**s**-escola* 'lit. ship**s**-school') and sometimes also in N2 (*couve**s**-flore**s** *'cawliflowers'). Recent data attest that NN plural variation is largest than in the past.

Data extracted from the written database CETEMPúblico (www. linguateca.pt/cetempublico/), a large corpus of Portuguese newspaper language, show a relevant variation regarding plural of NN Portuguese compounds. Parallel data have been extracted from a Brazilian newspaper database — CETENFᴏʟʜᴀ (Folha de São Paulo) —, also available at www. linguateca.pt. The following table displays the number of tokens (by decreasing order) of each NN structure collected in both databases.

TABLE 4 – NN Pluralization in Portuguese and Brazilian databases

Single inflection: [N$_{INFLECTION}$ N]			Double inflection: [N$_{INFLECTION}$ N$_{INFLECTION}$]		
	CETM Público	Folha SP		CETM Público	Folha SP
(8 a) decretos-lei 'decree-laws'	179	3	(8 b) decretos-leis	60	9
(9 a) palavras-chave 'keywords'	179	23	(9 b) palavras-chaves	3	9
(10 a) projectos-piloto 'pilot projects'	89	2	(10 b) projectos-pilotos	3	0
(11 a) pombos-correio 'pigeons	21	0	(11 b) pombos-correios	15	1
(12 a) homens-rã 'men-frog'	12	0	(12 b) homens-rãs	9	0
(13 a) cidades-dormitório 'dormitory towns'	12	0	(13 b) cidades-dormitórios	3	2
(14 a) cidades-fantasma 'ghost towns'	5	3	(14 b) cidades-fantasmas	4	1
(15 a) empresas-fantasma 'ghost companies'	7	1	(15 b) empresas-fantasmas	4	1
(16 a) fatos-macaco 'work overalls'	14	0	(16 b) fatos-macacos	7	0
(17 a) cafés-concerto 'café-concert'	17	0	(17 b) cafés-concertos	4	0
(18 a) mulheres-objecto 'women-object'	2	0	(18 b) mulheres-objectos	0	0
(19 a) visitas-relâmpago 'visits-lightning'	5	5	(19 b) visitas-relâmpagos	0	0
(20 a) governos-sombra 'shadow governments'	4	0	(20 b) governos-sombras	0	0
(21 a) cães-polícia 'police dogs'	23	0	(21 b) cães-polícias	33	0
(22 a) couves-flor 'cawliflowers'	1	0	(22 b) couves-flores	5	0

The data presented by decreasing values show that in Portugal as well as in Brazil the old pattern (Single inflection), with N1 marked by plural, is best represented than the new one (Double inflection).

The exceptions are the following data from Portugal: cã**es**-polícia 'police dogs' (23 tokens) vs. cã**es**-polícia**s** (33 tokens) and couv**es**-flor 'cauliflowers' (1 token) vs. couv**es**-flor**es** (5 tokens) and *palavras-chaves* in Brazil.

Nevertheless, the plural of N2 increased in the last decades and promotes a changing stage of Portuguese, Italian, Spanish languages.

In order to determine if single or double plural pattern is correlated with syntactic context, we analyzed the phrasal and sentential constructions selected by NN, and we conclude that there are no syntactic constraints to any inflectional pattern. Data illustrate (cf. next table) that single and double inflection takes place in the same syntactic conditions: variation remains independently of them.

TABLE 5 – Syntactic contexts associated with NN constructions

Single inflection: [X$_{\text{INFLECTION}}$ Y]	Double inflection: [X$_{\text{INFLECTION}}$ Y$_{\text{INFLECTION}}$]
(i) relative subordinate sentence:	
empresas-fantasma que recebem capitais 'ghost firms that receive capital' *empresas-fantasma* que se dedicam à subcontratação 'ghost companies that are engaged in outsourcing'	*empresas-fantasmas* que se dedicam ao tráfico 'ghost companies that that are engaged in trafficking'
(ii) prepositional phrase with modifier function:	
empresas-fantasma para burlas financeiras 'ghost companies for financial scams'	*empresas-fantasmas* de comunicação social 'ghost companies of social media'

The following table illustrates the three solutions adopted by Portuguese, Spanish and French for cognate NN. The same shading pattern is adopted for Romance equivalent NN.

TABLE 6 – NN Pluralization in Portuguese, Spanish and French

Pluralization	Portuguese	Spanish	French
I. N$_{[+ \text{PL}]}$ - N$_{[-\text{PL}]}$	visita**s**-relâmpago	visita**s**-relámpago	visite**s**-éclair
	empresa**s**-fantasma	empresa**s**-fantasma, situacione**s**-límite	
	palavra**s**-chave		notion**s**/mot**s**-clé
II. N$_{[+ \text{PL}]}$ - N$_{[\pm \text{PL}]}$	palavra**s**-chave(**s**)	momentos claves(**s**)	mots-clés (web) moments-clés (web) notions-clés (web)
		visitas relámpago(**s**)	
	empresa**s**-fantasma(**s**)	empresa fantasma(**s**), situaciones límite(**s**)	
	homen**s**-rã(**s**)	hombre**s**-rana(**s**)	
III. N$_{[+ \text{PL}]}$ - N$_{\text{P}[+ \text{PL}]}$			homme**s**-grenouilles

This table displays three situations: in III. both nouns are systematically marked by plural. In I. only N1 is pluralized, which means that N1 is seen as the head and N2 as a noun in apposition: an adjective would typically agree in number with the head of the compound/phrase. In **II.** N2 is either marked or not marked by plural: this situation corresponds to a fluctuation in which N2 is taken by the speakers as a noun, traditionally not pluralized (cf. table 4), or as a nominal predicator, and then marked by plurality.

There is a relevant asymmetry between French data collected outside and inside the web. The newest pattern N_{PL} - $N_{(\pm PL)}$ is well attested in several web sites.

5.1. Debating the data

Coordinate compounds behave as follows: both nouns are marked by plural, because a double head is present. NN coordinate compounds are defined as 'an N that is both N1 and N2', that is to say, a holistic merge of both constituents occurs. This is not the case of fr. *hommes-grenouilles*, pt. *homens-rã*(*s*), *sp. hombres-rana*(*s*) 'frogmen', because the human beings of this class are not frogs. How to explain that in Portuguese and in Spanish the plural of *homens-rã*(*s*) and *hombres-rana*(*s*) oscillates between Pattern I (N[+pl])-N[-pl]) and Pattern III (N[+pl])-N[±pl])? The conjunction of N1 and N2 into a unique being is referentially mandatory in case of coordination, and it is unavailable with the literal meanings of both nouns. Semantic coindexation is possible, if undergrounded by a figurative transfer.

NN such as *empresas-fantasma* 'ghost companies', *visitas-relâmpago* 'lit. visits-lightning' *palavras-chave* 'keywords', *situações-limite* 'limit-situations' can be described as attributive compounds: they are left headed endocentric constructions (not double headed constructions) whose meaning can be paraphrased as an N 'that is N1 and also an N2, with a metaphoric interpretation of N2'. The gender of NN is deduced from the head:

(25) as   *empresas-*   *fantasma*
     (FEM.PL)   (FEM.PL)   (MASC.SING)
(26) *os*   *homens-*   *rã*
     (MASC.PL)   (MASC.PL)   (FEM.SING)

Semantically, the NN attributive classification, characterized by a relation of modification between the head and the non-head constituent, is more adequate than a coordinative classification.

However, a great rate of variation can be observed between single and double plural strategy of N2 (cf. tables 4, 6). We claim that the plural of N2 does not transform N2 into an adjective, it is due to its predicative functioning. According to Fábregas (2005: 206), «Predication in an appositional construction is due to the presence of a relational structure that makes it possible that the noun that acts as a predicator selects the other element as its subject».

What features of N2 allow it to function as a predicator? Why doesn't the language select an adjective? Some N2 denote beings marked by animacy (*fantasmas* 'ghosts', *rãs* 'frogs', *macacos* 'monkeys', *polícias* 'police') which combine with N1 marked by the same feature. Other N2 denote inanimate objects (*chaves* 'keys') and combine in an open way with N1 denoting diverse classes of entities.

Some denominal adjectives cognate of N2 are not available, probably also because the mental lexicon of the speakers contains information about the predicative values of these nouns:

(25) *empresas-lídere(s)*: what would the denominal adjective derived from *líder* be?

(26) *situações limite(s)*: what would the denominal adjective derived from *limite* be?

(27) *momentos chaves(s)*: what would the denominal adjective derived from *chave* be?

(28) *visitas relâmpago(s)*: what would the denominal adjective derived from *relâmpago* be?

The adjunction of derivational suffixes *-ic-* and *-al*, the most productive in the formation of relational adjectives in contemporary Portuguese, is grammatical, but indeed they are not used with these nouns. In other cases the adjectives correlated with N2 are blocked by a different meaning:

(29) *eleições farsa*(s): [N *farsantes*] cannot replace [N *farsa(s)*], because *farsantes* has an agentive meaning that *farsa* lacks

(30) *empresas-lídere*(s) 'lider-organization(s)' vs. *liderantes* 'leading'

(31) *situações-limite* 'limit situations' vs. *limitantes* or *limitativas* 'limiting or restricting'

(32) *visitas-surpresa*(s) are visits unexpected, pleasant or not; the adjective *surpreendentes* means 'surprising; amazing; fabulous'

(33) the adjective *milagrosas*, in *terapias milagrosas* 'miraculous, fabulous therapies', can codify a causative ('that products miracles') and a figurative ('fabulous') meaning that is not carried by *milagre* (*terapias milagre*(s) 'miracle therapies').

The predicative impact of the noun is greater than the one of the adjective. As the construction with a nominal predicator is less prototypical, it is open to a broad variety of readings. Typically, a noun denotes a kind of an entity, rather than a single property (Wierzbicka 1986). But these nouns behave as predicators and, by consequence, at the same time they can perform two functions: they delimit a recognizable category of entities on the base of a property: *chave* 'crucial, core', *fantasma* 'inexistent, false', *limite* 'limit, extreme', *relâmpago* 'short and unexpected', *surpresa* 'unexpected'.

When the cognate adjective is available, as in the following case, the adjective is not equivalent to the noun:

(34) a. [*crianças*]$_N$ [*prodígio(s)*]$_N$ 'lit. children prodigy(s)'
     b. [*crianças*]$_N$ [*prodigiosas*]$_A$ 'prodigious children'.

The adjective (cf. 34 b.) assigns a stable feature to the entity denoted by N1. Apart from its categorizing frame, N2 modifies N1 (cf. 34 a.) through its predicative features (a *prodigy* 'something extraordinary'). N1 is then characterized by a noun that is a predicator: a *prodigy*. In this way, N1 is not defined or definitively characterized by the property associated to a state adjective (cf. 34 b.).

Summarizing: the noun is a more optimal and impressive choice than the cognate adjective, which is often unavailable. The internal cohesion of the construction is strengthened with a noun. An adjective can be displaced

(NA or AN) and modifiable, which does not happen with N2.

The next section aims at articulating the duality of plural patterns with the predicative classes of N2. Before, we remember that the Portuguese language is characterized by a rich contextual inflection: N1 is the head of the structure, and the modifiers must agree with it. Agreement is systematic when the modifier is an adjective, and unsystematic when the modifier is a nominal predicative.

6.   NN: grammar and predication

Regarding non-coordinative NN constructions, two situations must be distinguished:

(i) a subclassification type: N2 denotes a subclass, mainly a telic one, of N1: *artigos-viagem* 'lit. articles-travel', *seguro-saúde* 'health insurance'. The construction refers to a class of entities (N1) that is underspecified by the features of N2. In this case, as in other subordinate constructions, only the head is marked by plurality.

(ii) a qualitative type: N2 qualifies N1, with a set of properties typical of N2: the whole corresponds to 'N1 with some qualitative properties of N2': *desporto-rei* 'lit. sport-king', *situação-limite* 'limit situation', *empresa-líder* 'lit. company-leader': a stereotypical feature associated to an entity (*líder* 'leader', *fantoche* 'puppet', *piloto* 'pilot') is attributed, but the word that codifies this feature is not an adjective, although it denotes a property (*chave* 'crucial, core', *limite* 'limit, extreme', *rei* 'major'). These N2 behave either as nouns, rejecting plural, or as adjectives, being pluralized together with the noun (N1) they modify.

As the first subtype illustrates, plural variation of N2 is not unrestricted: when N2 is uncountable (cf. *saúde* 'health') or when N2 is used in a generic meaning and with a telic relation with N1 (cf. *artigos-viagem* 'articles for travel'), singular of N2 is the preferential solution. Henceforth, we are no longer focused on these subordinate compounds.

6.1. NN qualitative type and the 'Lexical Integrity Principle' applied to Romance Languages

The NN structures analyzed are similar to prototypical compounds since they obey the 'Lexical Integrity Principle': the insertion of lexical and grammatical items in the interior of this structure is mainly avoided, and any internal intrusion from syntactic procedures (elision, coordination, movement) is forbidden. NN in apposition (as well as NA) have an internal structure which is not accessible to syntax, and that is visible by the impossibility of modifying only one of the nouns.

As many authors (Scalise & Bisetto 1999, Fábregas 2005, Lieber & Scalise 2007) assume, internal inflection is not an adequate and applicable criterion for Romance languages; internal and double plural does not deny the 'Integrity Principle' of Romance compounds. Agreement is a syntactic device with scope on the whole structure; sometimes agreement is visible in some of the constituents and other times it is visible in all the constituents. Nevertheless, inflectional patterns are crucial for the delimitation of compound classes.

6.2. Classes of predication

The solutions presented for NN constructions are not disjunctive: NN compounds are to be taken as appositions with syntactic atomicity listed in the lexicon. It is well known that phrases can be 'downgraded' to words by a process of reanalysis. Within a syntactically oriented morphology, Fábregas (2005) states that NN are a specific type of phrases with a specific type of a projection. Next table presents the three classes of appositions proposed by this author.

TABLE 7 – Classes of NN constructions (Fábregas 2005: 202-203)

(i) PREDICATIVE APPOSITIONS	Partitive: *pantalones campana* 'trousers-bell, trousers with the shape of a bell'
	Holistic: *poeta pintor* 'poet painter', 'a poet that is also a painter'
(ii) KIND APPOSITIONS: *el presidente Zapatero* 'the president Zapatero'	
(iii) PROPER NAME / SURNAME: *Noam Chomsky*	

We assume that some NN constructions admit two ways of projection: as plurilexematic words, they can display a more or a less phrasal nature, with different patterns of inflection. As Fábregas (2005: 206) says, these «two classes of predicative appositions are the manifestation of the same type of structure, and they are only different in terms of the functional projections merged with that structure».

NN containing a predicative N2 are in the border of morphological and phrasal constructions. Within an attributive NN construction, as *festas surpresa* 'surprise parties', N2 is a noun, not an adjective, which explains that its plural is not systematic[3]; but N2 presents an attributive value: the noun *surpresa* 'surprise' (*festas surpresa* 'surprise parties') adds to its categorizing frame a predicative value; in *festas surpreendentes* 'surprising parties' the cognate adjective *surpreendentes* has a predicative meaning and lacks a categorizing power. In these NN constructions, there is a full predication of N1 combined with a partitive predication of N2 (Fábregas 2005)[4].

This double nature of this kind of N2 undergrounds the holistic or the partitive predication allowed and explains the oscillations regarding plural as well as regarding the grammatical relation (± attributive) between the nouns.

In the last decades N2 plural tends to increase (cf. *empresas-âncora*(s) 'lit. companies anchor(s)', *empresas-membro*(s) 'lit. companies member(s)', *escolas-depósito*(s) 'lit. schools deposit(s), *escolas-aviário*(s) 'lit. schools aviary(s)'). As mentioned above (section 4.), inflectional oscillation is close to attribution and systematic double inflection is close to coordination.

The next table intends to illustrate that partitive and holistic predication are two poles of a scale and that the gradience between single and ((a)systematic) double inflection is correlated with these two kinds of predication. The data are distributed in a continuum on the base of these two dimensions. The left column contains NN constructions with N2 [-Plural] and in the other extreme of the scale both nouns of the construction are pluralized. In the central position of this *continuum* there are NN constructions with a hybrid

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[3] Remember that when the construction contains an adjective, the compound NA has to be double inflected.
[4] A NN construction with a partitive predication is defined as follows by Fábregas 2006, p. 114: «en ella el nucleo es un sintagma predicación (Bowers 1993, 2001), una proyección relacional que seleciona como complemento un predicado y como especificador el argumento del predicado».

status: semantically they are close to attribution, inflectionnaly they behave either like attributive compounds or like coordinate compounds, and the predication they perform is then between a partitive and a holistic one.

TABLE 8 – Classes of predicative NN constructions

Partitive predication		Holistic predication
N2 [+ Plural] (Inflectional oscillation)		**N2 [+ Plural]**
single inflection	**double inflection**	(Systematic) **double inflection**
empresas-chave 'lit. companies-key'	*empresas-chaves* 'lit. companies-keys'	*escolas-empresas* 'lit. schools-companies'
empresas-líder 'lit. companies-leader	*empresas-líderes* 'lit. companies-leaders'	*igrejas-fortalezas* 'lit. churches-fortresses'
Attribution <-----------------> Coordination Single inflection <-------------> Double inflection		

Plural oscillation of N2 (cf. left vs. central columns) depends on the way in which N2 is processed by the speakers: (i) as a noun in apposition, and therefore not pluralized, or (ii) as a nominal predicator, and then marked by plurality. Systematic double inflection is close to coordination and inflectional oscillation is close to attribution. Single inflection is close to partitive predication and double inflection is close to holistic predication.

6.3. Final remarks

Only binary and non-interactive conceptions of language domains reject hybrid and boundary categories: it is not impossible that a NN structure can be seen as a construction in the frontier of morphology and syntax, with two readings. The borderline nature of a noun codifying a class by means of predicative features explains the fuzziness of the construction. A renewed insight as this one overcomes the compartmentalized views of the architecture of the language.

Nouns in apposition whose N2 have predicative power are borderline constructions since they support a partitive and a holistic reading. Inflectional fluctuation of N2 illustrates in an optimistic way their hybrid nature.

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