

Semantic evolution of pre-nominal possessives: A comparative quantitative study of French, Spanish, Portuguese, and Italian

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Abstract

This paper deals with a historical shift in the semantics and morpho-syntax of pre-nominal possessives in Romance languages. Empirically, their evolution follows one of the two main diachronic paths: they either stop co-occurring with determiners (French, Spanish) or, else, start requiring their presence (Portuguese, Italian). Contrary to the common view which associates the first case with a transition from a modifier to a determiner semantics and the second with a retention of a modifier semantics (e.g. [Alexiadou 2004](#)), we propose that there is a common semantico-syntactic shift underlying both patterns, the rise of an innovative grammar which parses noun phrases with possessives as relational determiner phrases. The surface difference is accounted for by differences in what role a possessive plays in the spellout: either it serves as an exponent of D in the context of a relational component R (the first group) or as an exponent of R itself (the second group). We argue that this shift is part of a more general switch to a D-grammar, which happens as a consequence of an emerging pressure to morphologically mark existential presupposition at the noun phrase level. The more general change independently manifests itself as the overall rise in the frequency of determiners. On the basis of datasets from historical treebanks of French, Spanish, Portuguese, and Italian, we compare rates of change in possessive patterns, as well rates of the rise of determiner frequency across Romance.

Keywords: semantics of possessives; determiners; existential presupposition; language change; diachronic semantics; historical French; historical European Portuguese; historical Catalan; historical Brazilian Portuguese; historical Spanish

1 Introduction

The goal of this paper is an analysis of major historical shifts in the distribution of pre-nominal possessives in Romance languages, namely, the emergence of a ban on their co-occurrence with determiners in some languages and of a requirement of co-occurrence in others. Despite surface dissimilarity, we will propose a unified account of the changes, arguing that in all cases they reflect an underlying passage to a new structure and semantics of NPs involving a D-head.

All early medieval Romance languages feature pre-nominal possessive morphemes which can co-occur with determiners. Examples (1)–(4) illustrate this for medieval French, Spanish, Portuguese, and Italian.

- (1) MEDIEVAL FRENCH
la tue aname el ciel seit absolthe!
 DEF your soul in.DEF heaven be.SBJ absolved
 “...that your soul may be absolved in heaven!” 10XX-ALEXIS-PENN-V,82.751
- (2) MEDIEVAL PORTUGUESE
 alçou **os seus** ombros
 raised DEF his shoulders
 “he raised his shoulders” from Mattos e Silva (1989: 181), cited from Miguel (2002b)
- (3) MEDIEVAL SPANISH
la su fija
 DEF his daughter
 “his daughter” PCG 9b13-14 from Ishikawa (1997: 205)]
- (4) MEDIEVAL ITALIAN
 Salamone, per **la tua** colpa tu se’ degno di perdere lo reame
 Salomo by DEF your fault you yourself deserve to lose DEF kingdom
 “Salomo you deserved it by your own fault to lose your kingdom” (Novellino IV) from Kupisch & Rinke (2011: 98)

The historical fate of this configuration was different depending on the language. Over the course of time French and Spanish used such possessives with determiners and quantifiers less and less frequently, and in modern varieties they never co-occur, as (5) and (6) show.

- (5) MODERN FRENCH
 Que (***la**) **ton** âme soit absolue !
 that DEF your soul be absolved
 “That your soul may be absolved!”
- (6) MODERN SPANISH
 Puedes tomar (***el**) **mi** libro
 you.can take DEF my book
 “You can take my book.”

Portuguese and Italian took, as it were, the opposite path and ended up requiring that pre-nominal possessives be always accompanied by a determiner. That is, a non-use of a determiner is now ungrammatical in these languages.

- (7) MODERN (EUROPEAN) PORTUGUESE
 (***Os**) **meus** dias são melhores que **as** **vossas** noites
 DEF my days are better than DEF your nights
 “My days are better than your nights.” From Miguel (2002b: 221)
- (8) MODERN ITALIAN
 Per quanto tempo Blurb conserverà ***(il) mio** libro?
 for how.much time Blurb will.keep DEF my book
 For how long will Blurb keep my book?

In the literature the (non)co-occurrence property has been analysed as reflecting the morphosyntactic status of possessives (for references see [Alexiadou \(2004\)](#)). [Lyons \(1985\)](#) draws a distinction between adjectival and determiner-like possessives and adjectival-genitive-languages and determinative-genitive languages, respectively. [Cardinaletti \(1998\)](#), in her seminal work on the typology of possessive forms, distinguishes between three types of adnominal possessives: adjectival strong possessives, adjectival weak possessives, and (clitic) possessive determiners. While the former two types can co-occur with determiners, the latter, according to [Cardinaletti \(1998\)](#), cannot because it syntactically incorporates into D, which precludes the use of another determiner. In this view, the contrast between (5)-(6) and (7)-(8) has been taken to indicate that French and Spanish “lost” pre-nominal adjectival possessives, while Portuguese and Italian did not. In structural terms, this means that pre-nominal possessives in French and Spanish switched their status from XP to X^0 (D^0) (e.g. [Alexiadou 2004](#), [Van Peteghem 2012](#)), while in Portuguese and Italian they did not.

We argue, however, for a unified analysis. Empirically, it is an established fact that Romance languages lost bare (determiner-less) noun phrases on definite interpretation. We propose that this global change triggered a reanalysis of possessive noun phrases into structures with relational determiners, that is, determines which

involve a relation between members of the denotation of the noun and a certain contextually-given individual as part of their semantics. In other words, at the level of an extended nominal projection we are dealing with a single shift: a replacement of the grammar parsing possessive nominal expressions as an adjectival projection plus a noun by a grammar which parses them as a relational determiner plus a noun, as schematized in (9).

- (9) a. $[_{NP} [_{AP} A] N]$ old pan-Romance grammar of noun phrases with possessives
 b. $[_{DP} D [_{RP} R [_{NP} N]]]$ new pan-Romance grammar of noun phrases with possessives

Within this new grammar, some Romance languages, such as French and Spanish, spell out D as a possessive exponent in the presence of the relational heads R, whereas in others, such as Portuguese and Italian, a possessive exponent spells out the relational component itself. Fundamentally, however, the noun phrase structure has been changing in a uniform way, and the shift in (9) is a part of a more general switch to a D-grammar in definite contexts among Romance languages schematized in (10).

- (10) a. $[_{NP} N]$ old pan-Romance grammar of noun phrases on definite interpretation
 b. $[_{DP} D [_{NP} N]]$ new pan-Romance grammar of noun phrases on definite interpretation

In what follows, we will establish comparative quantitative profiles of changes (9)-(10) based on historical treebanks and show that there is a remarkable similarity in the patterns across the four Romance languages in question.

This paper is organized in the following way. In section 2, we discuss languages which lost the determiner-possessive co-occurrence and establish quantitative properties of determiner distribution both in NPs with possessives and without. In section 3, we do the same for the two languages in our sample which manifest a seemingly opposite historical trend, i.e. an increase in the frequency of determiner-possessive co-occurrence. We present syntactic and semantic details of the proposed unified account in section 4 and conclude in section 5.

2 Decline of co-occurrence

2.1 French

Old French features two morphologically distinct paradigms of adnominal possessive morphemes. The two paradigms are illustrated for the first person possessives in tables 1–2 from [Buridant \(2019: 219\)](#). We label the paradigms “short” and “long” as pre-theoretical descriptions referring only to their relative morphological weight.¹

	SINGULAR		PLURAL	
	NOMINATIVE	OBLIQUE	NOMINATIVE	OBLIQUE
MASCULINE	mes	mon	mi	mes
FEMININE	ma	ma	mes	mes

Table 1: Old French short adnominal possessive forms.

	SINGULAR		PLURAL	
	NOMINATIVE	OBLIQUE	NOMINATIVE	OBLIQUE
MASCULINE	miens	mien	mien	miens
FEMININE	meie	meie	meies	meies

Table 2: Old French long adnominal possessive forms.

There is no consensus as to whether or to which extent the morphological contrast is a reflection of syntactic and semantic differences. [Gamillscheg \(1957\)](#) argues that the distribution is governed by metrical considerations only.² A similar conclusion is reached by [Arteaga \(1995\)](#), who notes that the two types can be coordinated, suggesting syntactic and semantic equivalence. In contrast, [Buridant \(2019\)](#) and [Butet \(2018\)](#) argue that the two series contrast with respect to the possibility to co-occur with determiners: while short forms tend to not co-occur, long forms tend to do so. [Butet \(2018\)](#) identifies co-occurrence as a hallmark of an adjectival status, and non-co-occurrence as a signature of determiners.

We investigated the distribution of the two series in the treebanks of [Martineau et al.](#) and [Kroch & Santorini \(2010\)](#) (approx. 1.5 million words). Figure 1 shows the choice between short/long forms with each determiner type, as well as without any

¹ In the literature the labels stressed/unstressed (or *tonique/atone* in French) are sometimes used (e.g. [Buridant \(2019\)](#)). We opt for long/short to stay agnostic with respect to the phonological status of the forms in question.

² Cited from [Alexiadou \(2004\)](#).

determiners (“poss” on the x-axis). We see that both paradigms could combine with determiners, however, with different frequencies.

Examples (11) and (12) illustrate co-occurrence of a short form *tos* and long form *tuen*, respectively, with an *l*-determiner.³

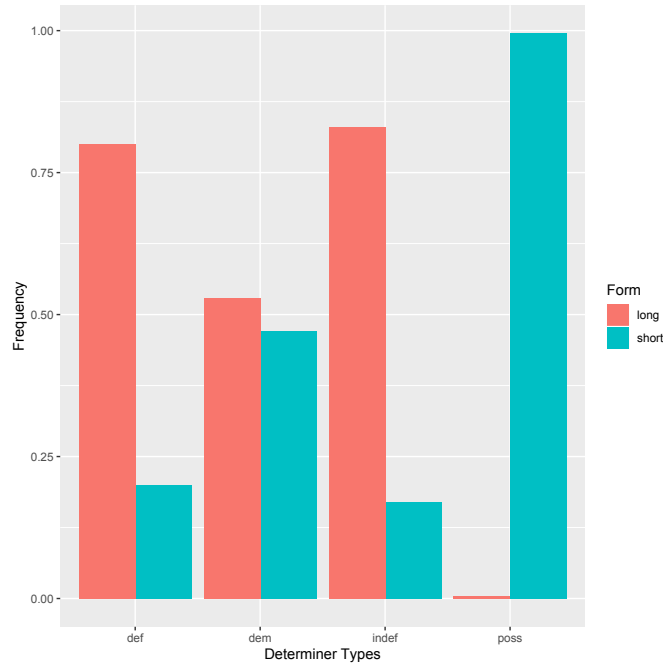


Figure 1: Determiners in NPs with pre-nominal possessives in French.

- (11) Los **tos** enfanz qui in te sunt, a males penas aucidront;
 DEF your.SHORT children that in you are to bad pains succumb
 “Your children inside you will succumb to violent pains”.
 (1000-PASSION-BFM-P,100.41)
- (12) E tantes lermes pur le **tuen** cors plurét
 and many tears for DEF your.LONG body cried
 “And she shed so many tears after you.” (10XX-ALEXIS-PENN-V,95.860)

³ In order to make sure that we are not dealing with a dialect-specific morphological contrast neutralization, we verified that the texts from which we took our examples feature forms from both paradigms. Out of 50 texts in the corpus, long forms are never attested in 8: *Lapidaire alphabétique* (attributed to Philippe de Thacon, 1st third of the twelfth century), *Lapidaire en prose* (middle of the twelfth century), *Psautier de l’orne* (twelfth century), *Proverbes réunis par Serlo de Wilton* (ca. 1165), *Quatre fragments de miracles de la Vierge* (second half of the twelfth century), *Chansons de Conon de Béthune* (Conon de Béthune, ca. 1180–1190), *Aucassin et Nicolette* (late twelfth century), and *Sermon anonyme sur sainte Agnès* (first half of the thirteenth century).

Examples (13) and (14) illustrate co-occurrence of short and long forms, respectively, with an indefinite determiner.

- (13) d' un **son** filz voil parler.
of a/one.SHORT his son wants talk
“I want to talk about his son.” (10XX-ALEXIS-PENN-V,3.41)
- (14) Mais uns **siens** moines donat sa pense a mobiliteit,
but one his.LONG monk gave his though to moving
“But one of his monks was planning to leave.” (1190-DIALGREG2-BFM-P,92.815)

Examples (15) and (16) make the same point for DPs with demonstratives.

- (15) Beau sire, ne desdeigne Tan[t] cele **ta** bone compaigne;
dear sire not despise so.much this your.SHORT good companion
“Dear sir, do not despise so much your good companion.” (1212-EUSTACE-
FISHER-PENN-R,48.634)
- (16) Et par ainsi faictz penitance de ceste **tienne** mauvaistie
and by so do penitence for this your.LONG wrongdoing
“And in this way repent of your wrongdoing” (1523-NEW-TESTAMENT-PENN-
P,18R.451)

Modern French retained only one paradigm of adnominal possessives forms, the one that morphologically corresponds to the short forms.⁴ Figure 2 shows the decline of the estimated probability of long forms with time.

⁴ Today, long forms are attested sporadically in an archaic/ironic style, e.g. *cette mienne vie* lit. ‘this mine life’.

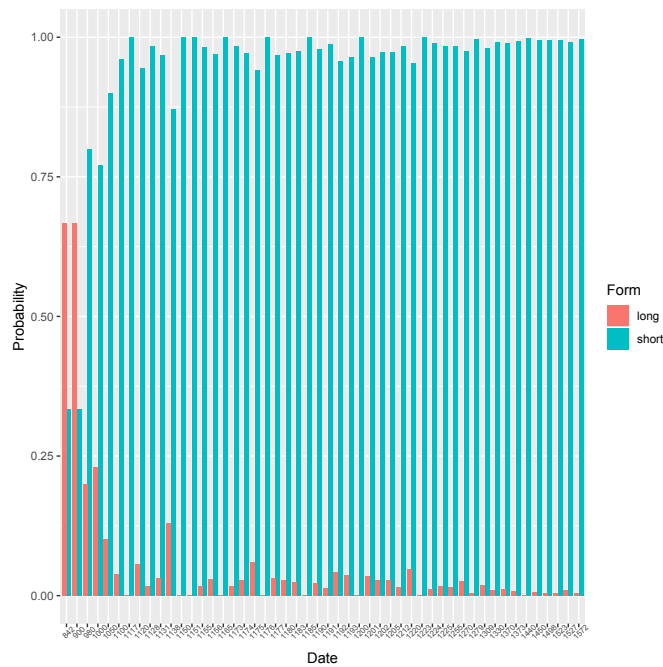


Figure 2: Short vs. long forms in French.

In Modern French, co-occurrence of these short pre-nominal possessives with all types of determiners is strictly ungrammatical, as (17) and (18) illustrate.

- (17) MODERN FRENCH
 Que (***la**) **ton** âme soit absolue !
 that the your soul be absolved
 “That your soul may be absolved!”
- (18) MODERN FRENCH
 Il veut parler de (***un**) **son** fils.
 he wants speak of a his son
 “He wants to talk about his son.”

Figure 3 represents in red the frequency of (both long and short) pre-nominal possessives co-occurring with determiners across centuries. The data consists of noun phrases with pre-nominal possessives (33,798), and the relative frequency corresponds to the proportion of noun phrases with a determiner (definite, indefinite or demonstrative) among all noun phrases with pre-nominal possessives in a given text. To see if we can detect a statistically significant chronological trend, we fit a logistic regression of the form in (19) to our dataset. The model predicts the probability that the binary variable Determiner takes on the value *yes* given variable

Date as a predictor. The coefficient β reflects the importance of the time factor for predicting the probability of the presence of a determiner. In the model at hand it equals -0.003, which happens to be a statistically significant value ($p < 2 \times 10^{-16}$). That is, the likelihood that the perceived temporal trend is simply due to chance and in reality the weight of the time factor is zero is extremely small. That the coefficient is negative means that for the higher values of date the model predicts lower probabilities of determiner appearance.

On the same figure we plotted in blue a model fitted to a dataset of NPs without possessives (191,075). Again, the coefficient, 0.001, is highly statistically significant, indicating a positive trend in the frequency of determiners across time in noun phrases without possessives.

$$(19) \quad P(\text{Determiner} = \text{yes} \mid \text{Date} = d) = \frac{e^{\alpha + \beta d}}{1 + e^{\alpha + \beta d}}$$

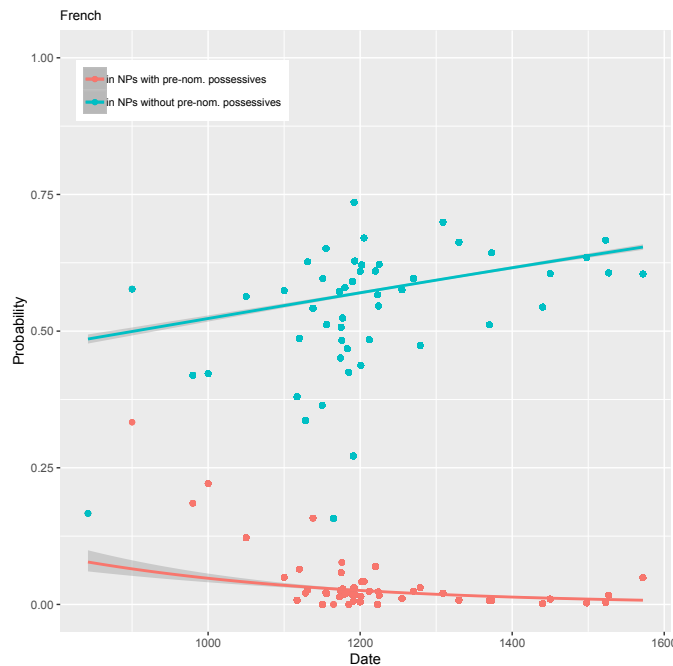


Figure 3: Determiners with pre-nominal possessives in French.

Looking at Figures 2 and 3, one may think that the decline in co-occurrence is a by-product of the decline of long forms, and that the patterning of the short forms could have stayed the same. However, if we limit our dataset to the short forms only (24643 noun phrases), we observe an extremely similar diachronic declining trend.

2.2 *Spanish*

Another case of the disappearance of determiner-possessive co-occurrence is attested in Spanish. Both medieval and Modern Spanish feature two paradigms of possessives: short and long forms. In Modern Spanish, short forms are always pre-nominal and long forms post-nominal. The former cannot co-occur with determiners in Modern Spanish, as illustrated in (20)-(21).

- | | | | |
|------|---|------|--|
| (20) | MODERN SPANISH
(*la) su casa
the his/her house
‘his/her house’ | (21) | MODERN SPANISH
la casa suya
the house her
‘her house’ |
|------|---|------|--|

In medieval texts both series occur with and without determiners both pre- and post-nominally (Labrousse 2018: 38). However, in quantitative terms short forms tend to occur pre-nominally (Labrousse 2018: 39 and earlier references therein). Like in French, the co-occurrence ban for the pre-nominal possessives emerged over time. Again, as in French, this change was accompanied by the rise in the frequency of determiners in NPs without possessives. Below we present quantitative data on both developments in Spanish and compare them with the results we obtained for French.

A logistic regression model of the form in (19) fitted to NPs with pre-nominal possessives (7703, from Labrousse (2018)) is plotted in Figure 4. Next to it, we plotted a model fitted to NPs without possessives from *P.S. Post Scriptum* corpus (6121) (the data on NPs without possessives is not present in Labrousse (2018)). The *P.S. Post Scriptum* corpus spans a later period (Early Modern Spanish) than the data from Labrousse (2018).

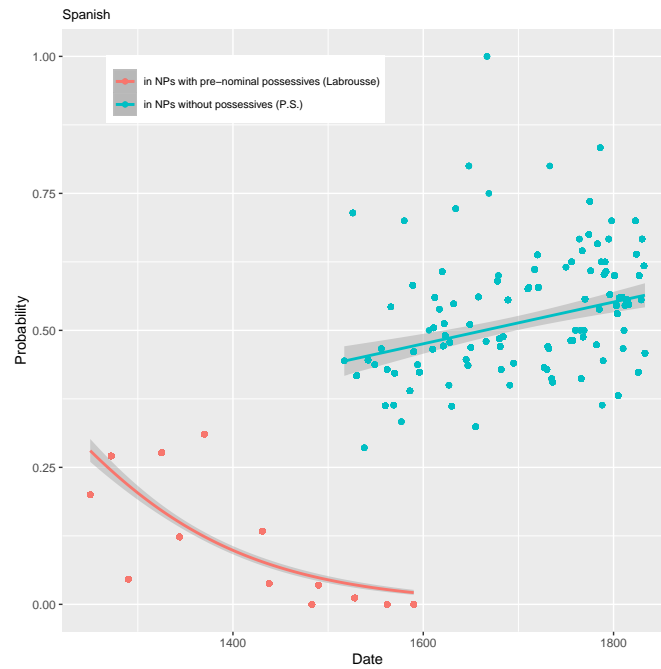


Figure 4: Determiners in Spanish.

In order to make comparison between the two changes more intuitive, and also to compare Spanish with French, we plotted in Figure 5 predictions that respective logistic regression models make models for time points for which actual data may not be available.

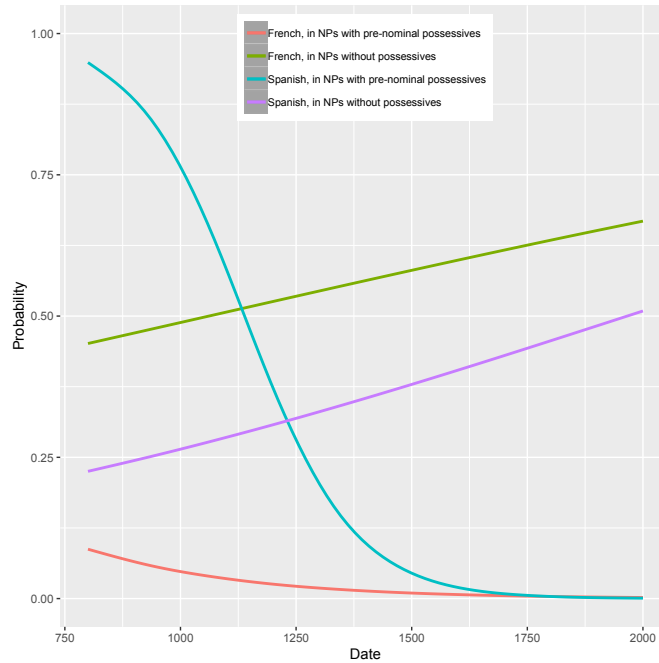


Figure 5: Determiners in Spanish and French.

Table 3 presents estimates of the intercept and coefficient (rate of change) parameters of the four models (of the type in (19)). Asterisks indicate (high) statistical significance of an estimate. The most interesting estimate, the coefficient, indicates how much the probability of determiner use depends on time and whether (later) time affects this probability positively (positive values) or negatively (negative values). A higher coefficient points a greater rate of change (a faster change).

	French		Spanish	
	without poss.	with poss.	without poss.	with poss.
INTERCEPT	-0.85*	0.265	-2.08*	9.64*
COEFFICIENT	0.001*	-0.003*	0.001*	-0.008*

Table 3: Parameter estimates of logistic regression models for French and Spanish.

Ignoring coefficient signs, we see that in both languages the change progresses faster in the context of pre-nominal possessives. Our running hypothesis is that the underlying force of the changes in possessive-determiner co-occurrence patterns is an emerging requirement to mark definiteness at the NP level, which grammatically manifests itself as an increasingly frequent parsing of noun phrases on definite

interpretation as DPs. However, what we track in our models is the frequency of all types of determiners together. It is known, however, that the rise of indefinite determiners occurs later than the rise of definite determiners in Romance languages. NPs with possessives are presumably interpreted more often as definite than NPs without, which means that the determiner spread in this context is expected to reflect mostly the spread of definite determiners, whereas in NPs without possessives the determiner spread corresponds to the rise of both definite and indefinite determiners. We suggest that this is why determiner use appears to change faster in NPs with possessives.

Comparing French and Spanish, we note that the higher intercept for French in all NP context points to an earlier change onset than in Spanish. In other words, according to our estimates, determiner spread began earlier in French than in Spanish. We come to the same conclusion if we compare intercepts for the changes in NPs with possessives: in the case of a negative trend a lower intercept for French indicates an earlier change onset. That is, both determiner spread and the disappearance of determiner-possessive co-occurrences began earlier in French than in Spanish. On the one hand, the discrepancy between French and Spanish as to the offset of both evolutions is coherent with the global time lag as to the emergence of determiners in Spanish with respect to French, pointed out by [Carlier & Lamiroy \(2018\)](#). On the other hand, the temporal correlation between determiner spread and the disappearance of determiner-possessive co-occurrences in both languages is an entirely expected result on the hypothesis that the two developments actually reflect one underlying semantic shift.

3 Rise of co-occurrence

3.1 (*European*) Portuguese

In Modern Portuguese, possessives can occur both pre- and post-nominally, as in (22)–(23). According to [Brito \(2007: 31\)](#) (among many others), pre-nominal possessives “are normally used with definite articles”, whereas post-nominal ones are used with indefinite articles, numerals, *wh*-words, as well as without determiners.

(22) MODERN EUROPEAN PORTUGUESE
o meu livro
the my book
‘my book’

(23) MODERN EUROPEAN PORTUGUESE
um livro meu
a book my
‘a book of mine’

Brito (2007) also reports that some speakers accept pre-nominal forms with indefinite determiners, as in (24), and suggests that those are vestiges of a medieval pattern.

- (24) MODERN EUROPEAN PORTUGUESE
 Uma **minha** amiga saiu.
 a/one my friend left
 ‘One of my friends left.’ Brito (2007: 31)

As Figure 6 shows, in the corpus of Galves et al. (2017) we indeed find some cases like this. Specifically, among 50 noun phrases where a possessive co-occurs with an indefinite determiner, there are 12 noun phrases with a pre-nominal possessive.⁵ We thus conclude that the association with pre-nominal possessives and definite determiners emerged over time.

Unlike in Modern Portuguese where a determiner is obligatory in the presence of a pre-nominal possessive, in Old, Middle, and Early Modern Portuguese possessive forms can either co-occur with determiners, as in (25), or be used without, as in (26).

- (25) MEDIEVAL PORTUGUESE
 e assim fiquei sem poder negar **a minha** vaidade.
 and like.this stayed without be.able deny the my vanity
 “and so I was unable to deny my vanity” A_001_PSD,07.53

- (26) MEDIEVAL PORTUGUESE
 Assim que **meu** pai morrer
 like.this as my father dies
 ‘As soon as my father dies.’ ID B_005_PSD,16.405

This variation concerns both pre- and post-nominal possessives. The distribution of pre- and post-nominal possessives with different determiner types is illustrated in Figure 6 (“poss” stands for a possessive not co-occurring with a determiner) based on the corpora of Galves et al. (2017) and P.S. Post Scriptum. We see that pre-nominal possessives dominate with definite determiners, whereas in the presence of an indefinite we most often find a post-nominal possessive. Nouns without determiners are much more often accompanied by pre-nominal rather than post-nominal possessives (the total number of pre-nominal forms is 2771 and of post-nominal 58).

⁵ Of these, 7 cases involve a noun *amigo* (“friend”) or *inimigo* (“enemy”).

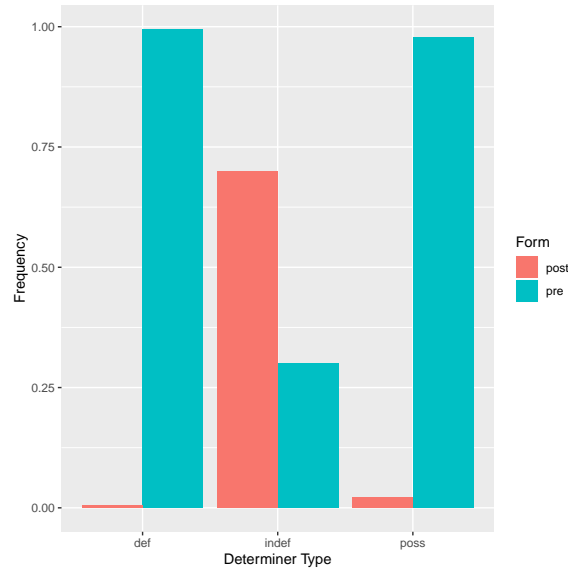


Figure 6: Possessives with different determiner types in historical Portuguese.

In addition to the possessive forms used in Modern Portuguese, medieval Portuguese also had short forms (e.g. *mo* and *m(h)a* for the first person for masculine and feminine gender, respectively). The short-long distinction was lost during the medieval period.⁶ Importantly, according to Labrousse (2018: 41) (and contra Miguel (2002a), who assumes that short forms were D-clitics incompatible with other determiners), there are instances of both short and long forms co-occurring with determiners in medieval texts.

Labrousse (2018) presents quantitative data on the co-occurrence of pre-nominal possessives with determiners in historical Portuguese. We plotted her data in Figure 7, showing a clear rising trend, which is supported by a statistically significant coefficient of a logistic regression of the form in (19) ($\beta = 0.005$, $p < 2 \times 10^{-16}$) fitted to a dataset consisting of 11443 noun phrases with pre-nominal possessives. We co-plotted a logistic regression model fitted to NPs without possessives taken from the corpora of Galves et al. (2017) and P.S. Post Scriptum (27604 NPs), which cover a shorter time span.⁷ Parameter estimates for both models are given in table 4, together with estimates for French and Spanish models repeated from table 3.

⁶ Short forms are not attested in the Galves et al. (2017) corpus. In P.S. Post Scriptum we find one occurrence of *su* inside of a PP, pre-nominal and without a determiner. This is not surprising given that both corpora cover data from the fifteenth century on.

⁷ Again, we did this because the data on the overall distribution of determiners is absent from Labrousse (2018).

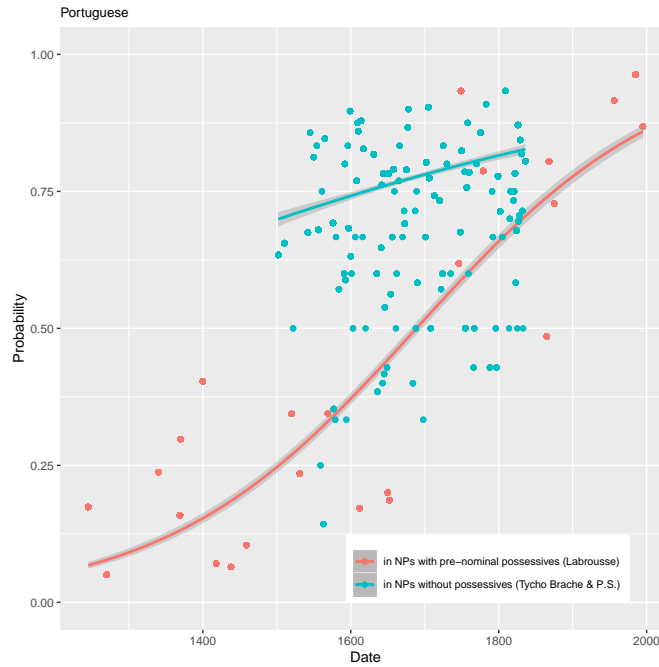


Figure 7: Determiners in Portuguese.

	French		Spanish		Portuguese	
	W/O POSS.	WITH POSS.	W/O POSS.	WITH POSS.	W/O POSS.	WITH POSS.
INTERCEPT	-0.85*	0.265	-2.08*	9.64*	-2.38*	-9.98
COEFFICIENT	0.001*	-0.003*	0.001*	-0.008*	0.002*	0.006*

Table 4: Parameter estimates of logistic regression models for French, Spanish, and Portuguese.

We observe that in absolute terms the rate of change of the frequency of determiners in NPs with pre-nominal possessives in Portuguese is quite similar to the corresponding rates in French and Spanish. Also, just as in French and Spanish, this rate is higher than the spread of determiners in NPs without possessives (0.002 with vs. 0.006 without). Finally, notice that the rates of determiner spread in NPs without possessives are very similar across the three languages (0.001 in French and Spanish and 0.002 in Portuguese).

3.2 *Italian*

In our language sample, Italian patterns with Portuguese in that historically the frequency of determiners with possessives goes up, as we will see, roughly parallel to the frequency of determiners in NPs without possessives. In medieval Italian text we find adnominal possessives without determiners, as in (27), as well as with.

- (27) MEDIEVAL ITALIAN
 e a colui che avea perduto per **sua** colpa e follia, tutto
 and to the.one who had lost by his fault and foolishness all
 donasti?
 gave.you
 “and that you gave everything to the one that had lost his authority by his
 own fault and foolishness?” (Novellino VII) from Kupisch & Rinke (2011: 98)

Both pre- and post-nominal determiners in Old Italian exhibit variation with respect to co-occurrence with determiners. In the corpus of [Sanfelici \(in preparation\)](#) (spanning the thirteenth c.), pre-nominal occur with determiners somewhat less frequently (66%) than post-nominal (78%). The difference turns out to be statistically significant on a chi-square test ($\chi = 9.4927$, $df = 1$, $p\text{-value} = 0.002$).

Our estimates of the probability of determiners with pre-nominal possessives overt time are based on the study of [Kupisch & Rinke \(2011\)](#), except for the data around 2000 which we took from the corpus of [Bosco et al. \(TUT\)](#), while our estimates of the probability of determiners in NPs without possessives are done based on the treebanks of Old Italian of [Sanfelici \(in preparation\)](#) and [Bosco et al. \(TUT\)](#) (again, dates around 2000). In [Figure 8](#), we plotted logistic regression models, analogous to the models presented above, to two datasets, NPs with possessives (1790) and NPs without possessives (38450). Parameter estimates for these models are given in [table 5](#), along with the three languages we have already discussed.

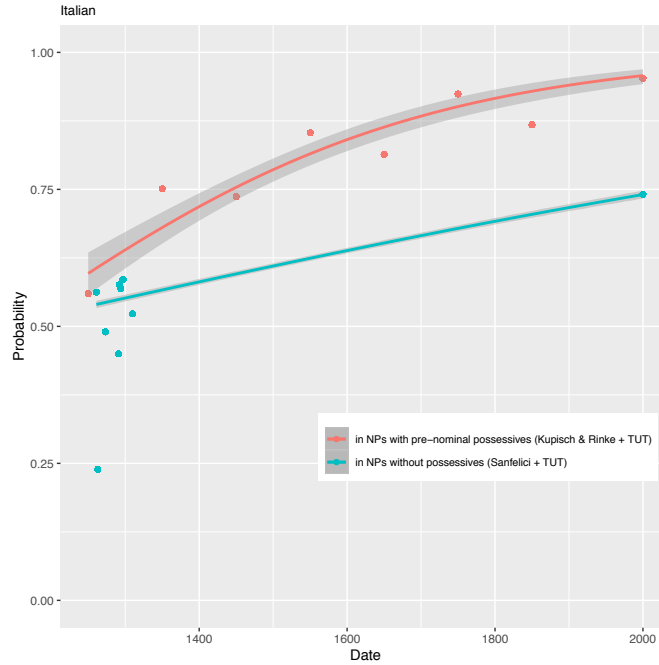


Figure 8: Determiners in Italian.

	French		Spanish		Portuguese		Italian	
	W/O POSS.	WITH POSS.	W/O POSS.	WITH POSS.	W/O POSS.	WITH POSS.	W/O POSS.	WITH POSS.
INTERCEPT	-0.85*	0.265	-2.08*	9.64*	-2.38*	-9.98*	-1.35*	-4.15*
COEFFICIENT	0.001*	-0.003*	0.001*	-0.008*	0.002*	0.006*	0.001*	0.003*

Table 5: Parameter estimates of logistic regression models for French, Spanish, Portuguese, and Italian.

In this summary table we observe that, given our estimates for the intercept parameter, both in Portuguese and Italian the rise of determiners in NPs without possessives precedes their rise in NPs with possessives (in both cases the intercept for the change in NPs without determiners is greater). We also observe that, just as in the three other cases, in Italian the rate of change in the context of NPs with possessives is higher than in NPs without possessives (the coefficient is 0.003 in the former and 0.001 in latter case). Another important observation is that parameter estimates for the rise of determiner frequency in NPs without possessives is identical for French, Spanish, and Italian (0.001), Portuguese having a slightly higher rate (0.002).

In Figure 9 we reproduce plots for the four languages side by side for the ease of comparison.

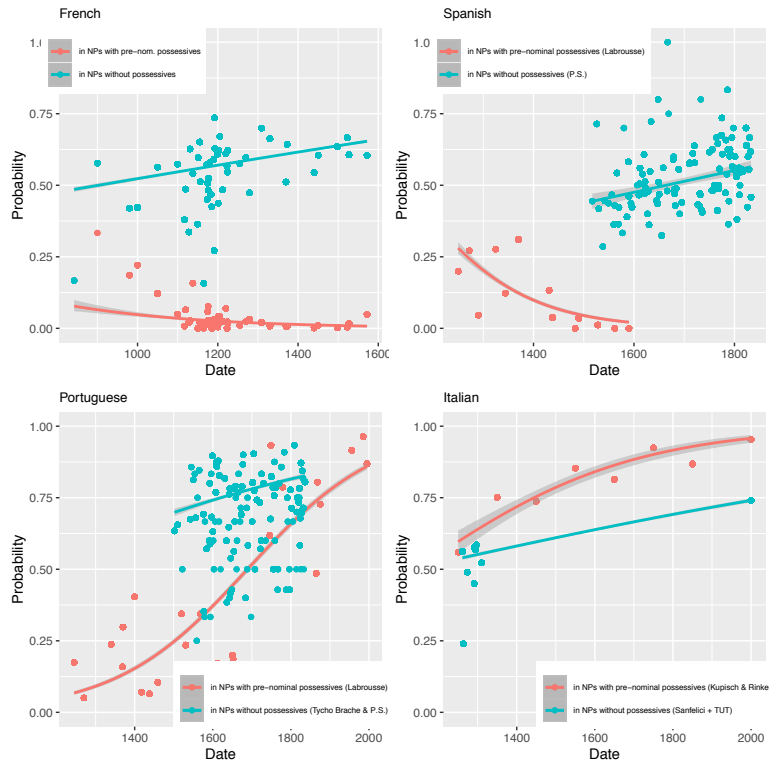


Figure 9: Determiners in French, Spanish, Portuguese, and Italian.

4 The rise of D

Our analysis of changes in possessive-determiner patterns in French, Spanish, Portuguese, and Italian is couched in the perspective of grammar competition which assumes that in a given population of speakers more than one syntactic or semantic analysis of an utterance can be available (e.g. Kroch (1989) for language change). In the literature on the topic, this angle has already been invoked for Portuguese by Miguel (2002b) and Brito (2007). In particular, Brito (2007) suggests that there are three available grammars in Modern Portuguese: a dominant grammar where pre-nominal possessives have the status of Adjectival heads (associated with a definiteness feature and therefore requiring a definite determiner), a non-dominant medieval heritage grammar where they are APs indifferent to definiteness (and thus compatible with both definite and indefinite determiners), and another non-dominant

grammar (the seeming avant-gard of the language) in which they spell out heads adjoined to D (and therefore can occur without overt determiners).

In what follows, we built on this perspective. However, rather than focusing on the status of possessive morphemes as such, we propose to analyse the changes we observe in the four language in terms of an innovation at the level of the noun phrase as a whole, namely, as the replacement of a noun phrase grammar without obligatory DP layer a grammar with such layer, as in (28) repeated from (10).

- (28) a. $[_{NP} N]$ old pan-Romance grammar of noun phrases on definite interpretation
 b. $[_{DP} D [_{NP} N]]$ new pan-Romance grammar of noun phrases on definite interpretation

The idea that Romance languages acquire an additional functional category, D, compared to Latin is of course not new. What is new in our approach is the proposal that the changes in the patterns involving pre-nominal possessives across Romance, despite seemingly opposite trends, are a direct consequence of this innovation, as supported by strikingly similar quantitative trends, once we abstract away from the direction of the change (i.e. increase vs. decrease in determiner frequency) and focus on its rate in absolute terms.

At first sight, French and Spanish manifest historical trends which are the reverse of what we observe in Portuguese and Italian: whereas in French and Spanish pre-nominal possessives progressively become incompatible with determiners, in Portuguese and Italian the co-occurrence of pre-nominal possessives with determiners rises with time. We argue, however, that the contrast concerns only the morphological realization of particular functional heads, whereas the noun phrase with a pre-nominal possessive is restructured in a uniform manner across these languages, namely, as schematized in (29).

- (29) a. $[_{NP} [_{AP} \mathbf{A}] N]$ old pan-Romance grammar
 b. $[_{DP} \mathbf{D} [_{RP} \mathbf{R} [_{NP} N]]]$ new grammar in French & Spanish
 c. $[_{DP} D [_{RP} \mathbf{R} [_{NP} N]]]$ new grammar in Portuguese & Italian

Morphologically, in the French and Spanish scenario, the innovative grammar in (29b), which ends up dominant, spells out D as pre-nominal possessives in the context of a relational head. In other words, a pre-nominal possessive is an exponent of D in the context of R. In contrast, in Portuguese and Italian the innovative grammar spells out a relational head R as a pre-nominal possessive.

4.1 *Semantics of a relational head R*

We propose that semantically R is a relational predicate introducing a relation between a particular individual (e.g. a possessor) and an element or elements from the denotation of the nominal phrase. We borrow R from the semantic decomposition of demonstratives in Elbourne (2008). Simonenko (2014) argues for a syntactic as well as semantic decomposition of demonstratives into D and R, and Simonenko (to appear) applies this representation to possessive determiners. Based on demonstratives' incompatibility with noun phrases that denote a singleton (*#this twentieth president of the US*), Simonenko (2014) proposes that R comes with an anti-uniqueness presupposition, which is reflected in the lexical entry in (30) in the form of the constraint that the cardinality of the extension of the nominal property in the relevant situation be greater than 1.

$$(30) \quad \llbracket R \rrbracket = \lambda P_{\langle e, \langle s, t \rangle \rangle} : |\{x: P(x)(s)\}| > 1 . \lambda Q_{\langle e, \langle s, t \rangle \rangle} . \lambda y . P(y)(s) \ \& \ Q(y)(s)$$

Satisfying the anti-uniqueness condition implies that there exist individuals with the nominal property in the relevant situation. This, in turn, means that a context that meets the conditions on the use of R, also meets the existential condition normally associated with the semantics of a definite D. Moreover, assuming a Maximize Presupposition principle (Heim (1991)), such a context requires the use of a definite D, provided that other conditions on its use are also met.

We proposed above that the (speakers of) four Romance languages in question started progressively analysing NPs with pre-nominal possessives as structures involving R. Given the semantics of R in (30), this proposal predicts that pre-nominal possessives have a strong tendency to appear with definite, rather than indefinite determiners in those languages where they spell out R. This is overwhelmingly the case in Modern Portuguese, as we discussed in section 3.1. Similarly, in a corpus of Modern Italian by Bosco et al. (TUT), among 284 NPs with pre-nominal possessives, there is only one instance of an indefinite determiner all other cases featuring definite determiners. This exceptional case, given in (31), seems moreover to be an instance of a use of *una* as a cardinal numeral rather than an indefinite.⁸

⁸ The number of possessives in a post-nominal position is much lower than in a pre-nominal: only 4 cases. Of these, 2 are accompanied by a definite determiner, and 2 occur without a determiner. This makes it impossible to compare the distribution of determiner types with pre- and post-nominal possessives.

- (31) MODERN ITALIAN
 Una sua frase è ormai passata alla storia.
 one his sentences has by.now gone into history
 “One of his sentences has by now gone down in history.” Bosco et al.
 (TUT)

4.2 Head status of pre-nominal possessives

There is syntactic evidence in favour of analyzing pre-nominal possessives in Italian and Portuguese as spelling out a head (that is, R) rather than a phrasal constituent. Cardinaletti (1998) shows that pre- and post-nominal possessives in Italian differ with respect to a number of syntactic tests, such as adverb modification (no for pre-nominal, yes for post-nominal), coordination (no for pre-nominal, yes for post-nominal), and the possibility of non-human possessors (yes for pre-nominal, no for post-nominal).⁹ Brito (2007) adduces similar evidence for Portuguese. In Portuguese, pre-nominal possessives cannot be modified by “exclusion” adverbs (*só*, *apenas* “only, just”), (32), in contrast to post-nominal determiners, (33).

- (32) MODERN PORTUGUESE
 *O **só** meu problema é que não percebo nada disto.
 DEF only my problem is that not understand nothing of.this
 Intended: “My only problem is that I don’t understand it.” Brito (2007: 32)
- (33) MODERN PORTUGUESE
 Um problema **só** meu é que não percebo nada disto.
 INDF problem only my is that not understand nothing of.this
 “My only problem is that I don’t understand it.” Brito (2007: 32)

Based on this pattern and the assumption that heads cannot be coordinated (Kayne 1994), Castro & Costa (2002) propose that pre-nominal possessives in Portuguese are heads.

According to Brito (2007: 34), coordination of pre-nominal possessives is marginally acceptable in Portuguese provided one of the coordinated members is focalised, as in (34). It is preferred, however, to use post-nominal possessives in cases of coordination, as in (35).

⁹ Cardinaletti (1998) concludes that Italian possessives are XP generated in different locations within a DP: pre-nominal in a spec of a left-peripheral head and post-nominal – to the right of the noun.

- (34) MODERN PORTUGUESE
 ?O **meu** e **TEU** artigo está aqui
 DEF my and YOUR paper is here
 ‘My and your paper is here.’ Brito (2007: 34)
- (35) MODERN PORTUGUESE
 Um artigo **meu** e **TEU** foi publicado na revista
 INDF paper my and YOURS was published in.DEF journal
 ‘A paper of mine and yours was published in the journal.’ Brito (2007: 34)

5 Conclusion

We examined historical changes in the distribution of determiners in NPs with pre-nominal possessives and in NPs without possessives in four Romance languages from the perspective of a uniform change hypothesis. We showed that the uniform change hypothesis is supported by quantitative profiles we established for four languages. While looking at changes in determiner distribution in the two environments does not reveal a necessary link, our findings in four languages strongly suggests that rise/decline of possessive-determiner co-occurrence on the one hand and the rise in determiner frequency on the other are related.

First, in our sample all languages show statistically significant time trends *both* with respect to determiner frequency in NPs with possessives and in NPs without possessives. If, for, instance, the decrease in determiner-possessive co-occurrence in French and Spanish was due to a reanalysis of pre-nominal adjectival possessives as determiners, there is no a priori reason to expect the two trends to consistently come hand in hand across languages.

Second, in all the four languages determiner frequency invariably changes faster in NPs with possessives than in NPs without possessives.

Third, there is a remarkable similarity between the rate of change in determiner frequency in NPs without possessives: in the four languages, the logistic regression coefficient is estimated to be 0.001–0.002.

Fourth, there is a temporal dependency between changes in determiner frequency in two kinds of NPs: if a language manifests a (relatively) earlier change onset in one environment (e.g. earlier increase in determiner frequency in NPs without possessives in French than Spanish), it also manifests a (relatively) earlier change onset in another environment (e.g. earlier decrease in determiner frequency in NPs with possessives in French than in Spanish).

As part of the uniform change hypothesis we argued that languages where pre-nominal possessives keep co-occurring with determiners throughout the time, such as Portuguese and Italian, are not “conservative” (contra Van Peteghem (2012), among

others), but rather undergo the same change as languages where the co-occurrence possibility disappears. The nature of evidence that we evoked in support of this claim is two-fold. Quantitative, rather than observing preservation of co-occurrence patterns, we observe a rise in determiner occurrence in NPs with possessives in these languages. Qualitatively, pre-nominal possessives overwhelmingly co-occur with definite, rather than indefinite determiners. This property distinguishes them from run-of-the-mill adjectival predicates in these languages. In morphosyntactic terms, they do not pattern as phrasal constituents, resisting adverbial modification and coordination. In contrast, adjectives and post-nominal possessives in Italian and Portuguese allow for both. We captured this collection of facts by proposing that (dominant dialects of) Modern Portuguese and Italian, just as French and Italian, result from the rise of a grammar which analyses NPs with pre-nominal possessives as involving a relational predicate R. The uniform change hypothesis accounts for the modern contrast in co-occurrence in variation in the type of head pre-nominal possessives realize: D in French and Spanish and R in Portuguese and Italian. Further research will examine sources of the contrasting morphological strategies adopted by the two groups of languages for realizing identical syntactic structures.

Abbreviations (mandatory)

DEF = definite, INDF = indefinite, DEM = demonstrative

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