

On Spanish Prepositional Prefixes and the Cartography of Prepositions*

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Abstract

Despite its potential appeal, the possibility of analyzing prefixes as prepositions (and thus as syntactic objects) faces several problems related with selection, headedness and semantic isomorphism. In this article, I try to understand and solve these problems. I focus on prefixed nouns, and more specifically on the fact that some of them have their bases interpreted as grounds (*pre-coma*, ‘something before a coma’), while others have them interpreted as figures (*pre-cognition*, ‘cognition before something’). I will propose that in the structures where the base can be interpreted as figure or ground the prefix is a very low prepositional modifier of the noun and the two readings depend on the interpretation of a pronominal category introduced by the preposition. This configuration is forced by the absence of a functional category from the preposition’s structure; when independent conditions force this functional category to be present, the figure reading is impossible and the prefix behaves as a preposition.

Key words: Prefix, preposition, figure and ground, selection, syntactic analysis of words.

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1. Prefixes, prepositions and linguistic data

The concepts used in traditional grammars are mainly descriptive. This situation is particularly noticeable in morphology, where units such as suffix and prefix are defined purely by a positional criterion (to the right or to the left of a morphological base), a notion that was abandoned more than fifty years ago, with good reasons, in syntactic analysis. Due to this, in morphology it is crucial –even more crucial than in syntax– to try to understand the theoretical value of these traditional notions, if any. The

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understanding of these notions very frequently depends on understanding the similarities and differences they hold with respect to better established concepts in syntax. In the particular case of prefixes, some linguistic data suggest that a subgroup of them might belong to the syntactic category called preposition, taken here to refer to a morphologically invariable class of words whose syntactic role is to relate two noun phrases, associating them by means of a semantic relationship.

The linguistic data that lead us to think that some prefixes, so-called prepositional prefixes (PPrefs), are identical to prepositions refer to three generalizations. The first one is that, cross-linguistically, PPrefs may be morphophonologically identical to prepositions. In Spanish, the preposition *ante*, ‘before, in front of’, has a prefixal counterpart (*ante-cámara*, ‘ante-chamber’); the same goes for *contra*, ‘against’ (*contra-ejemplo*, ‘counter-example’), *sobre*, ‘over’ (*sobre-cama*, ‘overbed, quilt’), and many others. Other prefixes in modern Spanish are not formally identical to prepositions, but historically come from Latin or Greek prepositions, such as *peri-*, *sub-*, *pre-*, *pro-*, *ultra-* or *meta-*.

Secondly, the subclass of prefixes considered here acts as a semantic relator, that is, is used to relate two (and no more) entities to each other, which is the semantic function of a preposition (Hale & Keyser 2002). To the same extent that the preposition *bajo*, ‘under’, denotes a (locative) relation between its complement and a second noun phrase (*pedra bajo el árbol*, ‘rock under the tree’), the prefix *sub-* gives rise to the same semantic structure in words such as *sub-marino*, ‘undersea, submarine’, where the prefix relates a particular class of entities with another one. The meaning contribution of locative and temporal prefixes (*pre-*, *ante-*, *post-*, *trans-*, *supra-*, *inter-*, *intra-*...) is relational in precisely this sense.

Thirdly, in head-final languages, where adpositions appear to the right of the noun phrase they introduce, and are thus called postpositions, the morphological equivalents of these units can manifest as suffixes. Basque is such a language (Gràcia & Azkárate 2000: 65), as shown by *historia-aurrea* (‘history-before, pre-history’).

These data point in the direction of considering some prefixes (the PPrefs) versions of prepositions. In this article I will propose an analysis of prefixes as reduced prepositions. By reduction I mean that the set of heads that syntactically represent the structure of a preposition can be not fully present in the structure corresponding to the prefix. This has two effects: the nominal structure that combines with the prefix needs to be reduced -as the prefix structure would not be able to license their properties, in contrast to the prepositional structure- and the behaviour of the prefix itself differs from that of the preposition in crucial respects, while other properties are kept.

If such reduction were possible, it would have implications for the debate about the distinction between morphology and syntax. If some prefixes are the syntactic category P, a system where the grammatical and semantic relations inside a word are identical to those established inside a phrase would be likely; if, however, prefixes happen to be homophonous to Ps, or even historically derived from them, but have a different nature, such a situation would favour a lexicalist analysis where words are distinct grammatical structures and, thus, morphology is not equal to syntax.

Despite the reasons to analyse PPrefs as P, there are some problems that such a reduction needs to overcome. I will focus here on three of them, which I believe to be the most crucial. The first one has to do with projection. In syntax, when a preposition and a noun phrase combine, the label of the set thus formed is not NP (or DP), but PP; we know this, among other things, by the fact that the resulting construction can modify another NP (1).

- (1) un hecho *(de la) historia
a fact of the history, ‘a fact of history’

However, when a PPref combines with a noun, the result is generally a noun, not a P. (2) shows that the resulting construction cannot be used as noun modifier without a PP.

- (2) un hecho *(de la) pre-historia
a fact of the pre-history

This difference in the label of the resulting structure has serious consequences. In a Minimalist system (Chomsky 2004: 110 and fols.), where the number of grammatical heads is minimized and the combinatorial possibilities between them are freer, the projecting label after merge is the one that corresponds to the category that selects the other. Although the meaning of ‘select’ remains to be determined here, the fact is that, if P combines with a noun in both cases, and in both cases establishes a the same semantic relation, we would counterfactually expect P to project its label also when it is a prefix. In a Cartographic system (Cinque 1999) there is a very rigid Functional Sequence (Fseq), with an explosion of categories which, however, have very reduced combinatorial possibilities, such that each head is expected to occupy a fixed position inside the hierarchy. Given that prepositions dominate noun and determiner phrases (Svenonius 2007), if the prefix is a P, we expect a prefixed noun to be a PP, as having NP project over P would violate the Fseq. Either way, projection of the N label in a Pref-N combination is problematic.

The second problem has to do with selection. Ps generally do not select adjectives or verbs (3); however, PPrefs combine with them (4). In a cartographic system (4) constitutes an infraction of the Fseq, as P is expected to dominate D, not A or V; in a minimalist system, (4) requires that the selectional requisites of a prefix and a preposition are different so that prefixes can select A and V. It seems necessary, then, to assume that the prefix and the P are different either by their place in the Fseq or by their lexical features.

- (3) a. *Juan está sobre alto.
Juan is over tall (Intended: Juan is tall to an extreme).
b. *Juan está sobre volar.
Juan is over fly (Intended: Juan is flying at this precise point)

- (4) a. sobre-abundante, ‘over-abundant’
 b. sobre-volar, ‘to fly over’

The third problem relates to the previous two, and is basically a semantic compositionality problem. It is well-known (Talmy 1975) that Ps impose on their complements the reading of ground, and to the entity to which the ground is related, the reading of figure. The ground is used as a fixed point to establish a relation, and the figure is placed with respect to that ground. Compositionality dictates that the ground must be a complement, as the figure is located with respect to it. Due to Bare Phrase Structure (Chomsky 1993), the first element with which a projecting head combines must be its complement; indeed, the complement of P is the ground (5). We would expect the base of a PPref to be a ground also, but this happens only sometimes (6a); cases where the base is interpreted as the figure are also found (6b).¹

- (5) El libro está sobre la mesa.
 The book is over the table, ‘The book is on the table’
- (6) a. pre-coma, ‘pre-coma’
 b. pre-cognición, ‘pre-cognition’

In (5), as expected, the place occupied by the book (figure) is identified by setting a reference point, the table (ground), and defining a particular locative relation, ‘over’. In (6a), the whole word denotes a particular state (figure) whose temporal location is identified by setting a reference point, the coma (ground), and defining a relation between them: (6a) denotes ‘an X which happens before a coma’ and the base is ground. However, (6b) denotes ‘cognition which happens before an X’; here, the base noun is not the reference point used to locate something, but the entity which is located with respect to some reference point. The N in (6b) is the figure. (6b) constitutes a problem for semantic compositionality, selection and projection, and thus illustrates all the good reasons not to analyze PPrefs as Ps.

The existence of prefixed words where the base is interpreted as the figure was first analyzed by Zwanenburg (1992, 1994) and has been studied in Catalan, Spanish and Basque in Gràcia & Azkárata (2000), from a perspective where, basically, prefixes are prepositions that project either as heads or as adjuncts and whose selectional properties differ in each of these cases. This amounts to acknowledging that prefixes and prepositions are different units.

In contrast, in this paper, I assume a strictly syntactic approach to word formation. I will propose a way to overcome the three problems that analysing PPrefs

1. The figure-ground distinction is visible when the prefix combines with a noun, because nouns express kinds with which relations can be established, but also when the prefix combines with a relational adjective (argumental, dental), because these adjectives also denote kinds of objects. See Fábregas (2007) for an analysis of relational adjectives as nouns.

as Ps faces which does not involve changing the selectional properties of P when they project as prefixes. I will build the analysis on previous work by Svenonius (2007, 2009, to appear) inside a cartographic orientation.

2. Some generalizations

One reason to go for a syntactic analysis of these problems is that the cases where the base is interpreted as the figure are not lexically idiosyncratic, but correlate with specific properties of the base, the PPref or the whole word.

2.1. Restrictions on the semantics of the prefix

The first thing to notice is that not all prefixes can give rise to the figure-ground ambiguity. The ambiguity is generally possible for place and time prefixes: in (7a) the bases are interpreted as grounds; in (7b), as figures.

- (7) a. tras-patio ‘back-courtyard’, pre-estreno ‘pre-premiere’, infra-rojo ‘infra-red’
 b. tras-fondo ‘back-ground’, pre-aviso ‘pre-warning’, infra-estructura ‘infra-structure’

Some place prefixes, generally paraphrasable by locative adverbs rather than prepositions, are specialized in figure readings (*endo-esqueleto* ‘endo-skeleton’, *exo-material* ‘exo-material, material external to something’). Very few words formed with these prefixes allow for a ground reading, and it is not clear whether these exceptions have been structurally formed in Spanish, as opposed to having been taken as loanwords from Latin or Greek (such as *endo-cardio* ‘endocardium’, with a base which cannot be an independent noun in Spanish). By opposition, prefixes that denote a favorable or unfavorable attitude towards a concept or the object used to neutralize a particular instrument generally must have their bases interpreted as grounds. These prefixes are illustrated in (8).

- (8) a. anti-tanque ‘anti-tank’, anti-ácido ‘anti-acid’, anti-semita ‘anti-semitic’...
 b. pro-aborto ‘pro-abortion’, pro-amnistía ‘pro-amnesty’...

The prefix *contra-* requires some additional considerations. It has a use (9) in which it clearly belongs to the class of prefixes illustrated in (8). However, this prefix allows also for locative readings, illustrated in (10), in which it denotes, inside a spatial configuration, that the object occupies the position opposed to another object. As such, unlike *anti-* and *pro-*, it belongs to two different classes.

- (9) contra-ejemplo ‘counter-example’, contra-rrevolución ‘counter-revolution’...

- (10) contra-ventana ‘counter-window, shutter’, contra-portada, ‘back-cover’

It is frequent that with *contra-* the denotation of the base refers both to the entity against which something is performed and to the entity that is used against something, that is, that the base is the ground and the figure. A *counterexample* must be itself an example, but one which is provided to neutralize a previous example arguing in an opposite direction. In other words, both the figure and the ground refer to the same kind of entity, possibly because the prefix denotes a relation of neutralization between two opposed objects, which, because of this reason, tend to be of the same kind (*contra-peso* ‘counter-weight’, *contra-poder* ‘counter-power’...). Next to these cases, there are words where the base is interpreted as the ground (11a), next to other cases where a figure interpretation is preferred (11b).

- (11) a. *contra-veneno* ‘counter-poison, antidote’, *contra-rreforma*, ‘Counter-Reformation’
 b. *contra-cultura* ‘counter-culture, cultural movement opposed to some system’

The generalization that emerges from this picture is that those prefixes that only have a favorable or unfavorable attitude meaning (*anti-* and *pro-*) must get their bases interpreted as grounds, while those prefixes that at least allow a spatial or temporal reading generally give rise to readings in which the base is figure, ground or both (*pre-*, *contra-*, *infra-...*), with some of them strongly preferring a figure reading (*endo-*, *exo-...*). I will argue that prefixes that must denote a favorable or unfavorable attitude must always have in their structure a specific head, pP, which indirectly forces the ground interpretation of the base; prefixes that can denote spatial or temporal relations do not need pP, and thus allow or prefer figure readings.

2.2. Restrictions on the base

The prefixes *anti-* and *pro-* are among those that can combine with phrases (as opposed to single words, interpreted as syntactic heads in lexicalism) (12).

- (12) *anti-partido del gobierno*, *pro-derechos humanos*
 anti-party of.the government, pro-rights humans
anti-government party, *pro-human rights*

They are not the only prefixes that can combine with whole phrases. Some time prefixes, such as *post-* and *pre-*, also have this property. Crucially, under these circumstances, their bases must be interpreted as ground, even though they can get otherwise a figure reading.

- (13) a. *pre-guerra civil*
 pre-war civil, ‘pre-civil war’, period before a civil war
 b. *post-elección de los delegados*
 post-election of the delegates, period following the election of the delegates

Equally relevant is the fact that some of these prefixes can combine with proper names used in their referential sense, which involve some DP-structure on top of the noun (Longobardi 1994) (14). In all these cases, the base noun must be interpreted as the ground.

(14) anti-Bush ‘anti-Bush’, pro-Berlusconi ‘pro-Berlusconi’, post-Dante, pre-Aznar

2.3. Restrictions on the distribution of the prefixed word

Even though most prefixes do not change the syntactic distribution of the noun they combine with (cf. 1 and 2), some prefixes can have the effect of allowing the noun to be used as an NP modifier without the help of a preposition (15). This behaviour is systematic with *anti-* and *pro-*, and is allowed occasionally by other prefixes (*pre-*, *post-*). In these cases the base noun is interpreted as the ground, even if the figure interpretation is otherwise possible.

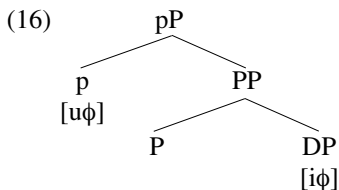
(15) crema anti-arrugas, ‘anti-wrinkle cream’; manifestaciones pro-apartheid ‘pro-apartheid demonstrations’; torneo inter-naciones ‘inter-nations tournament’; análisis pre-operación ‘pre-operation analysis’.

These generalizations show that the distribution of the figure-ground readings cannot be stated as part of the idiosyncrasies of each single word -or even of each single prefix-, as they are connected with a) the semantics of the prefix b) the nature of the base and c) the syntactic distribution of the prefixed word. A proper analysis must account for these properties.

3. An analysis

3.1. A few words about the background

I follow Svenonius (2007, to appear) on the proposal that prepositions contain at least a functional layer (pP) and a lexical layer (PP), as represented in (16).



PP in (16) corresponds in Svenonius’ system to a whole domain of heads with specialized information about different aspects of the space configuration, including (from lowest to highest heads) AxialPartP, PlaceP and PathP. The differences between these heads and their specific contribution are orthogonal to our article,

so I will simplify this domain and treat it all as a single head. Crucial to our purposes, though, is the role of pP in (16).

The lexical layer, PP, does not contain the formal features to perform case assignment, [u ϕ] (Chomsky 2004). Its function is to introduce a ground, which is taken as its complement. In this layer, some conceptual semantics is introduced; for example, the information contained here determines if the preposition denotes a spatial or temporal relation, from where the theta role of the ground may depend. I follow Roy & Svenonius (2009) in the proposal that this information is introduced in the lexical layer of P as conceptual information.

The functional layer, pP, is responsible for case assignment to the ground, as it introduces a [u ϕ] matrix of features that requires assignment with an [i ϕ] set of features contained in the ground. As these [u ϕ] features involve number and gender, which are not introduced at least until NumberP, a functional projection higher than NP in the nominal domain (Ritter 1991), the presence of pP requires that the ground is not a bare NP, but a fully fledged nominal structure with all functional projections; I suggest that this forces the ground to be of a higher type, at least NumP or, as I will argue based on the possibility of correferentiality, DP.

As other functional layers, pP contains some semantics. Svenonius (2009) argues that pP contains information about those relations that are based on the function performed by the ground with respect to the figure, as opposed to those that can be defined purely by a spatial or temporal configuration. For example, in (17a), the relation between the toothpaste and the toothbrush can be defined simply by a spatial configuration (one on the area on top of the other), and because of that it is compatible with the toothpaste falling outside from the toothbrush' end. In (17b), on the other hand, the relation is not merely spatial, but implies a function ('putting the toothpaste to properly use the toothbrush'); here the phrase is not compatible with the toothpaste falling on the handle of the toothbrush, or with the toothpaste remaining above the toothbrush without actually covering its end. This information related to the function associated to the configuration is provided by pP.

(17) a. put [the toothpaste above the toothbrush]

b. put [the toothpaste over the toothbrush]

[Svenonius 2009]

Some lexical items contain information that only requires PP, such as *on* or *above*, because they can express purely spatial or temporal configurations. I contend that some other lexical items, on the other hand, must always have pP, because their PP layer does not give us information about the temporal or spatial configuration between two objects. This is the case with *anti-* or *pro-*. These lexical items only provide us information about the function established between the figure and the ground; the figure is interpreted as favorable or unfavorable to the notion expressed by the ground, but nothing is told to us about the spatial or temporal configuration established between these two entities. Compare this to the prefix *contra-*. This prefix can denote the same relation as *anti-* or *pro-*, but crucially

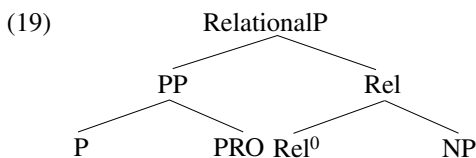
allows also for purely spatial readings (remember 10), and as such it does not require pP to be present in the structure, because its PP provides enough meaning on its own to define the relation. This property explains that *contra-* does not behave exactly as *anti-* or *pro-*, as shown in 2.1.

In the next two sections I will argue that PPrefs can appear in two configurations. In the first configuration, they are PPs, used as noun modifiers. This is, of course, only possible when PP provides enough conceptual information about the configuration established between the figure and the ground. Several consequences follow from the lack of pP, which lead to the structure in (18a), which represents the relation between the prefix and its base. The second configuration in which a PPref can appear is as a pP / PP, which leads to the structure in (18b) to represent the relation with its base. Of course, lexical items whose PP does not give enough semantics (*anti-* and *pro-*) must appear always with a pP that gives them information about the function established between the figure and the ground; thus, they are only compatible with (18b). Lexical items with a semantically strong PP (*infra-*, *contra-*...) can appear both in (18a) and (18b).

- (18) a. $[_{DP} [_{NumP} [_{AP} [_{RelP} [_{PP} P^0 \textit{tras} [\textit{PRO}]]] Rel^0] [_{NP}]]]]]$
- b. $[_{pP} \textit{tras}_i [_{PP} P^0] i [_{DP} [_{NumP} [_{AP} [_{NP}]]]]]]]$

3.2. The structure of the nouns with figure-ground ambiguity.

I propose the following structure for the prefixed nouns when the both the figure and the ground readings are possible, that is, under the cases discussed in §2.



Here, the prefix introduces a PP which acts as a modifier of the head noun. The PP introduces an empty pronominal category that I represent as PRO²; being a

2. It is important to emphasize right away that we are using PRO as a convenient term to capture a set of empirical properties, which we make clear later in this same section, and that it should not be taken as a tacit or explicit suggestion that this paper provides independent evidence for the existence of PRO as a syntactic primitive; this question is clearly orthogonal to the proposal and the analysis should be equally right (or wrong) independently of the status that is given to this object. In other words, we use the term PRO because the behaviour displayed by the construction under study fits with the properties traditionally associated to PRO. My analysis would be kept in its basic form if PRO was not a primitive and it could be reduced to an instance of movement to a theta position, as argued in Boeckx, Hornstein & Nunes (to appear). See footnote 3 for an outline of how my analysis would work if PRO was reduced to movement.

lexical category itself and lacking pP on top, the prefix does not have the formal features to assign case to this argument. This guarantees that PRO cannot be replaced by an overt noun, as no case assignment could take place; thus, it follows the ungrammaticality of a second noun inside the prefixed word, as in *pre-(*coma)-cognition*.

The PP and the NP are not directly related; they are associated to each other by a functional projection, RelationalP (RelP). This is a modifier-introducing projection, the lowermost in the noun domain. This equals these PPs to other very low modifiers, such as relational adjectives. Notice that the meaning of the prefix with respect to the NP is the one that generally is expressed by relational adjectives, one of whose properties is that they must be immediately adjacent to N⁰ (20), with all other noun modifiers being external to them. This follows if they are introduced in a very low position, immediately over the projection that defines the noun (cf. Bosque & Picallo 1996 for a similar structure, only that constructed by adjunction instead of intermediated by a functional projection).

- (21) a. conocimiento previo suficiente
 knowledge previous enough,
 b. #conocimiento suficiente previo
 knowledge enough previous, enough previous knowledge
- (22) a. barrera exterior de minas
 barrier external of mines, external mines barrier
 b. #barrera de minas exterior
 barrier of mines external, external mines barrier

NP is the locus where all the morphemes that define a word as a noun are introduced, including all kinds of nominalizers. We abstract away here from the differences in the internal structure of NP that would be associated to each nominalizer. The prediction is that all prefixes that have a figure or ground relation with the base are external to the nominalizers. This, as far as I know, is borne out.

RelationalP being the lowest of all the functional projections that introduce the noun modifiers, it follows that the structure in (19) can only be obtained if the structure with which the prefix combines did not contain any previous modifiers. These additional modifiers could only have been present in the complement of RelP if there were some even lower projections to introduce them, but this is not possible, as we have seen that relational adjectives must be strictly adjacent to the nouns they modified. If another modifier is introduced, it must be introduced on the specifier of a projection dominating (19). Therefore, it follows that when the prefix combines with a noun that already has modifiers, the structure in (19) cannot correspond to that situation, because in that case RelP would appear above modifier-introducing projections that are higher in the Fseq.

The structure also explains that these prefixes do not change the syntactic distribution of the base noun. They are modifiers, not heads that project and change the

category of the whole. RelP is part of the extended projection of the noun, and thus the whole is still a noun. RelP is dominated by the higher functional projections of the NP (Cinque 2005); qualitative adjectives are placed above it, as they are external to relational adjectives:

(23) Det > Num > Adjective > RelP > NP

In (19), as the PP does not take the NP as its complement, syntax is underspecified enough to allow for a figure and a ground reading, as the configuration does not tell us the specific semantic relation established between the P and the NP. Both readings are possible, and they depend on what is the controller of the PRO which P takes as its complement. In a word such as *tras-patio*, ‘back-courtyard’, the PRO in PP takes as controller the referential features contained in the DP, which c-commands the PRO, and which refer to whatever entity was denoted by the NP (24). Thus, the base and the ground of the P are correferential; even if the NP is not the ground of P, they refer to the same entity, so the base is indirectly interpreted as the ground.

(24) $[_{DP} D_i \dots [_{RelP} [_{PP} \textit{tras- PRO}_i] \textit{Rel}^0 [_{NP} \textit{patio}_i]]]$

In a word such as *tras-fondo*, ‘back-ground’, the PRO does not take the c-commanding D as its controller. Notice that prefixed nouns where the base is interpreted as the figure tend to be relational -that is, they require or presuppose some kind of complement- and also that in these nouns it is frequent that the ground of the prefix can be expressed as one of its modifiers (25).

- (25) a. un contra-ejemplo al ejemplo anterior
a counter-example to the example previous
- b. un super-índice del pronombre
a super-index of the pronoun
- c. un tras-fondo a estos hechos
a back-ground to these facts

In these cases, this (implicit or explicit) prepositional modifier of the prefixed word contains the controller of PRO. The entity denoted by the base and the entity interpreted as the ground of P are necessarily distinct, in these cases. The interpretation is a ground which is behind some X which is left underspecified, pending the identification of the implicit or explicit controller in the context. The base is only interpreted as the figure because the PP because the PRO is controlled by a non c-commanding DP, and therefore the ground semantic role is already assigned, leaving only the figure for the base. See (26), with English words.

(26) $[_{DP} D_i \dots [_{ModP} [_{PP} \textit{to} [_{DP} \textit{these facts}]_j] \textit{Mod}^0 [_{RelP} [_{PP} \textit{back- PRO}_j] \textit{Rel}^0 [_{NP} \textit{ground}_i]]]]]$

Admittedly, proposing a PRO in our analysis can be problematic, to the extent that the existence of this category has been challenged in favour of a movement analysis (Boeckx & Hornstein 2004, Boeckx, Hornstein & Nunes to appear). The properties of the complement of PP are those that descriptively have been proposed for PRO. Descriptively, what has been called PRO can take as its controller a c-commanding DP or a non c-commanding one. (27a), with a c-commanding one, matches (24), while (27b) matches (26), with a non c-commanding controller. Indeed, (27b) only allows the reading in which it is María who is expected to lead the party, and not the subject of *hemos pensado*.

- (27) a. Juan prometió lavar la ropa.
 Juan promised to.wash the clothes
- b. Hemos pensado en María para liderar el partido.
 Have.1pl thought in Mary to lead the party, 'We have thought that Mary should lead the party'

Another property of PRO is that it can be controlled by units that do not form a syntactic constituent. (28), where the presence of *juntos*, 'together', forces a collective reading, is an example of this: the promise involves both Juan and María going.

- (28) Juan prometió a María ir juntos al cine
 Juan promised ACC María to.go together to.the cinema.

We have already seen an equivalent of this in our case study. The prefix *contra-* allows readings in which the base noun is simultaneously the figure and the ground, as in *counter-example*. This involves that the PRO is controlled both by the c-commanding DP and the non c-commanding DP introduced as another modifier (29).

- (29) $[_{DP} D_i [_{ModP} [_{PP} to [_{DP} this\ example]_j] Mod^0 [_{RelP} [_{PP} counter- PRO_{i+j}] Rel^0 [_{NP} example_i]]]]]$

This does not constitute evidence in favour of PRO, but merely shows that the behaviour of our covert grounds fits with what has been described as a PRO. The goal of this paper is, indeed, not to argue in favour of PRO; our conclusion is simply that whatever object is identified in the contexts in (27) and (28) must be also identified as the ground of the PPs studied here, as the behaviour is the same in both cases. Given the problematic nature of the non c-commanding controllers and the split antecedents for the movement analysis of PRO, I keep this notation in my analysis for the time being.³

3. If movement was ultimately the right analysis of what has been called PRO, however, our analysis could also be tenable, even if in a different technical shape. The complement of PP would be a DP that, being embedded under a head which does not enter in a case relation with it, is not inactive and remerges (Gärtner 2002); it projects as a head, getting at this point coindexed with the NP that it dominates –explaining the ground reading of the base-; sideward movement (Nunes 2004) could

3.2.1. Evidence

I propose that the figure reading is possible when the prefix is a PP modifying the base with a PRO ground which might end up being correferential with the dominating DP or with another DP introduced as a modifier. Let us see the evidence.

A) PREFIXES WITHOUT A GROUND. One expectation is that in the structure of (19) the place of PP could be occupied by some heads that do not take a ground. This prediction is borne out. The figure reading is typical of the prefixes whose semantics correspond to the Spanish adverbs *fuera* ‘outside’, *dentro* ‘inside’ or *encima* ‘above’, among others which might not take a ground. The corresponding prefixes *exo-* (*exo-material*), *endo-* (*endo-skeleton*) or *super-* (*super-index*) combine with the base as in (30):

(30) $[_{DP} D_i \dots [_{RelP} [_{ParticleP} \textit{endo}] Rel^0 [_{NP} \textit{skeleton}_i]]]$

In the absence of a ground of P, the reading of the base would necessarily be ‘figure’. I am not concerned here with the category label that *endo-* should receive; it cannot be P if we want to restrict the label to heads that must take a complement. I label it Particle for descriptive purposes, pending more specific determination of its category.

B) ABSENCE OF SEMANTIC-TYPE CHANGES ON THE BASE. Another piece of evidence for (19) is the semantic type of the base. If the P, interpreted as place or time, took the NP as a ground, it could change its denotation from whatever it generally denotes to an area or a time period (Wunderlich 1991), because, by selection, P maps its complement into a different semantic category matching its own denotation. On the other hand, if the NP is never taken as a complement by P in this construction, then it cannot denote something different from what it generally denotes. A normal PP has indeed the power to change the denotation of its ground: the PP *after Bush* takes *Bush*, denoting an individual, and maps it into a time period (‘the time when Bush was the president’). Even if the ground is not a time period, it is forced to denote one by a time P. The data show, however, that with the prefixes the NP is interpreted exactly as it is interpreted without it. The word *pre-coma* can refer to a time period because the word *coma* already refers to a time period where a state takes place; *tras-patio* ‘back-courtyard’ denotes an area because the word *patio*, ‘courtyard’, already denotes one. Words derived with place and time prefixes do not need to refer always to time periods or areas, and can also refer to objects when the base noun denotes one. Consider the example *ante-ojo*, ‘before-eye, glasses’. If the P *ante* took *ojo* as its ground, the denotation of the noun would be an area; in our analysis, on the other hand, as P does not take the NP as its ground, the area reading is not forced, correctly predicting that it will refer to an object, exactly as the

reinterpret the non c-commanding cases. The analysis would stay in its basic form, with a different technical implementation to explain the correferentiality. The same DP would not be able to move out when the pP is present because this head would inactivate it.

noun *ojo* ‘eye’ refers to an object. Similarly, the prefixed nouns *ante-puerta* ‘before-door, curtain before a door’, *sobre-cama* ‘over-bed, bed clothing’ or *ante-firma* ‘before-signature, mark before a signature’ illustrate how the prefix does not have the power to force an area or time period reading when the base noun denotes an object.

It is true, however, that when the base noun denotes an object, the prefixed word might denote a different concept from the one denoted by the base noun: *cama* means ‘bed’, while *sobre-cama* means a type of clothing. We need to explain the change in the concept denoted. The solution that I will propose is that, as other nouns with low modifiers, the structure in (19) can be taken to be an idiom whose meaning is unpredictable. This is independently necessary, as we need to explain that *ante-ojos* refers to glasses and not to anything that can be in front of the eyes, or that *sobre-cama* means clothing and not anything that you can put on top of a bed. It is, moreover, not different from what we need to do with some nouns with relational adjectives or other low PPs (31) (both of which modifiers require strict adjacency to the noun) that denote a different concept from the one denoted by the noun alone.

- (31) a. llave inglesa ‘key + english, monkey wrench’
 b. ayuda de cámara ‘help of chamber, valet’

Another option, used by Gràcia & Azkárte (2000: 67), is to propose a structure with an empty noun which can provide the prefixed word with the new concept:

- (32) [_{NP} [_{PP} *pre* [_{NP} *history*]]] \emptyset]_N

I reject this solution for empirical reasons. These authors notice that their structure predicts that the gender and number of the prefixed word may be different from that of the base noun. In general, this does not happen with prefixed words; notice, for example, that the noun *ante-ojo* can appear in singular, as it denotes a single object, even if the object is put in front of the two eyes. The sequence **el anteojos*, where the determiner *el* is singular and the base noun is plural, is ungrammatical, as also the inverse **los anteojo*, with singular base and plural determiner.⁴

It is necessary to mention, in any case, that even if gender was different in the base and in the prefixed word (as seems to be the case sometimes in Catalan and Italian; Gràcia & Azkárte 2000: 68-69), this would not be evidence for an empty N, as NPs with demotivated meanings sometimes are associated to a different gender (33a) than the head noun (33b), without an empty N, as witnessed by the fact

4. Gràcia & Azkárte provide as an example of gender mismatch the noun *sobre-mano* ‘over-hand, osseous tumor on the hand’, which is registered in dictionaries as masculine, even if the base *mano* ‘hand’ is feminine. This word is absent from CREA (the corpus of contemporary Spanish of the RAE), and appears two times in CORDE (the historical Spanish corpus of the same institution), but in contexts where the gender is not visible. In the few Google examples, however, the word is feminine (i).
- (i) parece una sobremano (www.eki.es/foro)
 seems.it a tumor, ‘This seems a tumor’

that the indefinite article *un* combines with them as *un* (33a) and not *uno*, which is the compulsory form in front of empty Ns (33c).

- (33) a. *un cabeza de familia*
a head of family
- b. **un cabeza, un-a cabeza*
a.masc head, a-fem head
- c. *Quiero uno ø rojo.*
Want.I one ø red, 'I want one red'

C) IF, AND ONLY IF, A PREPOSITION CAN BE AN NP MODIFIER, IT CAN BE A PREFIX. Our final piece of evidence is that the prepositions that cannot be used as noun prefixes in Spanish are the same that independently are not possible as noun modifiers. As it is well-known, the prepositional phrases accepted as noun modifiers, if the noun is not relational -that is, if it does not require argumental PPs- and does not come from a verb, are very restricted. (34) shows the prepositions that are accepted by a noun phrase, if they are not licensed through argument structure, while (35) shows those that are not accepted under these circumstances.⁵

- (34) a. *el puente sobre el río Kwai* e. *un libro con tapas*
the bridge over the river Kwai a book with covers
- b. *el jardín bajo tu ventana* f. *una película contra Andreotti*
the garden under your window a movie against Andreotti
- c. *un vampiro ante el espejo* g. *un puente entre Brooklyn y New York*
a vampire in.front.of the mirror a bridge between Brooklyn and New York
- d. *el hombre tras la cámara* h. *un jersey sin mangas*
the man behind the camera a sweater without sleeves

5. It is crucial to distinguish these constructions from others in which the PP modifiers is interpreted as a predicate which denotes some state or property of an implicit argument of the noun phrase, as in (i), because in these cases the range of PPs accepted is much wider.

- (i) *una noche en la ópera*
a night at the opera

In (i) the PP does not establish a spatial or temporal configuration between *opera* and *night*, but rather denotes the situation of some implicit argument during the time defined by the noun *night*. It is not the night which is at the opera, but rather someone or something that was at the opera during the night. Contrast (i) to (ii), where the intended reading is that the head noun is located with respect to the complement of the PP, resulting in ungrammaticality in Spanish.

- (ii) **los tres cómicos en la ópera*
the three comedians at the opera

In (33) and (34) only structures with the reading in (ii) have been judged. We have also avoided prepositional idioms with a special meaning, such as *en la sombra*, 'in the shadows, secret', as they are presumably idioms where the preposition has been frozen with the noun phrase.

- (35) a. *el puente para Brooklyn d. *el puente desde New York
 the bridge to Brooklyn the bridge from New York
- b. *el puente hacia Brooklyn e. *el puente en New York
 the bridge towards Brooklyn the bridge in New York
- c. *el puente hasta Brooklyn f. *el túnel por New York
 the bridge to Brooklyn the tunnel through New York

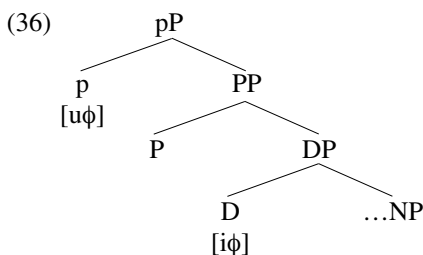
In our analysis, I expect that only the Ps that can be licensed as noun modifiers can be used as prefixes. This prediction is borne out, as seen in the following table.

Preposition	Licensed as noun modifier?	Used as prefix with nouns? ⁶
ante	YES (33c)	<i>ante-cámara</i> , ‘antechamber’
bajo	YES (33b)	<i>bajo-cubierta</i> , ‘area situated under the deck’
con	YES (33e)	<i>con-cuñado</i> , ‘person who is the brother-in-law of someone one is also the brother-in-law of’
contra	YES (33f)	<i>contra-ejemplo</i> , ‘counter-example’
desde	NO (34d)	unattested in nouns
en	NO (34e)	unattested in nouns
entre	YES (33g)	<i>entre-acto</i> , ‘between-act, interval’
hacia	NO (34b)	unattested in nouns
hasta	NO (34c)	unattested in nouns
para	NO (34a)	unattested in nouns
por	NO (34f)	unattested in nouns
sin	YES (33h)	<i>sin-techo</i> , ‘without-roof, homeless’
sobre	YES (33a)	<i>sobre-cama</i> , ‘over-bed, coverlet’
tras	YES (33d)	<i>tras-fondo</i> , ‘back-ground’

3.3. The structure of the words with forced ground reading

I propose that the cases where the ground reading is forced, because the prefix denotes an attitude, changes the distribution of the noun and / or combines with a noun with modifiers, correspond to the structure in (36)

6. There is, though, one arguably unexpected result, namely that the standard preposition to introduce noun modifiers, *de*, ‘of’, is unattested as a nominal prefix. This absence, however, presumably has an independent explanation. The prepositions *de* and *of*, and their cross-linguistic equivalents, lack any definite conceptual semantics (Langacker 1999) and have been argued to be morphophonological markers of genitive case (Borer 1984). This special status may suffice to explain that they cannot be used as prefixes.



Here the prefix corresponds not only to PP, but also to pP, that is, it contains a functional projection. This functional projection contains formal features that require that case is assigned to a DP. This DP needs to be contained in the domain of p, which is where the head can search for a match to erase its uninterpretable features. In consequence, this forces PP to take a DP as its complement, as opposed to a PRO (which lacks its own phi features); otherwise, the uninterpretable features of p would not be licensed. In other words, here the prefix is inserted as a head, not a modifier, that dominates the DP, in accordance with the Fseq proposed for prepositions (Svenonius to appear), which involves P > Det > Num > A > N. As the prefix projects as a head taking DP at its complement, it changes the grammatical category of the whole, explaining that in these cases the distribution of the NP is changed, allowing it to be the modifier of another noun, like any other pP. As the pP needs to combine with a DP to check its non interpretable phi features and assign case, the prefix takes in this case a noun with modifiers, because the functional projections that introduce all kinds of modifiers are below DP. This is not possible if the prefix is PP and is inserted as a low modifier itself (19), as in this case all the other modifier-introducing projections are above its insertion site.

Here the prefix takes the DP as its complement; this syntactic relation feeds the semantic interface with a configuration that must be interpreted as assigning the DP the role of ground. No ambiguity is possible, as the syntax is explicit about the relation between the elements in the form of a head-complement configuration.

Time and place prefixes have a purely conceptual semantics, by which they define a spatial or temporal coordinate. In contrast, such prefixes as *anti-* or *pro-* do not give information about the position of an object in space or time (as opposed to *contra-*); they merely denote the attitude of some entity towards something (as *anti-*, ‘opposed to X’, and *pro-*, ‘favorable to X’). I contend that by their semantics, these prefixes cannot make it without pP, as their PP does not provide enough conceptual information about a time or space configuration to appear independently of pP. The attitude towards something is comparable to the illocutionary force which, in sentences, must be encoded in CP, a functional head, and not in VP or any other lexical category corresponding to the predicate. As a consequence, attitudinal prefixes, must always be pP, because their meaning requires the functional layer provided by this head, and therefore they only allow for the structure in (36), never the one in (19). From here it follows that prefixes such as *anti-* and

pro- always combine with bases interpreted as grounds,⁷ while time and place prefixes can be introduced as the two structures: as modifiers (19), and as pP heads (36). (37) corresponds to the second.

- (37) pre-alzamiento militar
pre-uprising military ‘pre-military uprising’

Here, as the base *alzamiento* already contains modifiers (*militar*), ReIP is occupied and the prefix cannot be introduced there. It must project as a head, containing pP, and therefore the DP is taken as its ground.

3.3.1. Evidence

I argue that the presence of pP changes one crucial aspect: as it contains non interpretable features, it must assign case, and thus a) needs to project as a head b) takes a DP, not a PRO, in its domain. The meaning contribution of pP is necessary for some prefixes, such as *anti-* and *pro-*. Let us review the evidence for the structure in (36).

a) PRONOMINAL REFERENCE TO THE BASE. In (36) the complement of the prefix is a whole DP, not a single noun. As DP introduces referentiality, we expect this construction to be compatible with objects that have been independently diagnosed as DPs. We have already seen that prefixes can combine with proper names, provided that they are interpreted as grounds. The structure of *pre-Berlusconi* corresponds, then, to (36), with *Berlusconi* as the DP and *pre-* as a pP. Moreover, notice that *anti-* and *pro-* can combine with strong quantifiers and relatives without antecedent (38a); other prefixes also allow them, and in these cases the bases must be interpreted as ground (38b), suggesting they are pPs here.

- (38) a. Soy anti-todo lo que venga.
Am anti- all the which comes.subj, ‘I am against all that may come’
b. Lo hizo post-todo lo que sucedió.
It did post-all the which happened, ‘He did it after all what happened’

If the ground is a DP, and thus contains some referentiality, we expect pronouns to be able to refer to the ground, and the base to license ellipsis. The cases

7. Another candidate for a preposition that must project as a pP is *sin*, ‘without’. As a prefix it always has ground readings (i) and changes the syntactic distribution of the noun (ii), which must be glossed as an adjective in English. It can be argued that this prefix does not denote a spatial configuration of any kind: the preposition *con*, ‘with’, entails that the figure and the ground are in contact, but from the absence of this contact the position of the figure cannot be derived. If such, *sin* would not be just the negative version of *con*.

- (i) sin-techo, ‘without-roof, homeless’; sin-papeles ‘without-documents, illegal’
(ii) un hombre sin-techo
a man without-roof, ‘a homeless person’

of (39) illustrate that this is possible when the base is complex and must be interpreted as ground; (40) shows that this is generally impossible in the cases corresponding to the structure in (19), where the base is N and the figure interpretation is available.

- (39) a. Hay una ley anti-[Berlusconi]_i, y él_i ya la ha firmado.
There.is a law anti-Berlusconi, and he already it has signed.
- b. Hay un contra-[ejemplo]_i a ese_i que me has dado.
There.is a counter-example to that which me.DAT has given.
- c. Siempre hay pre-[guerra civil]_i antes de que haya una \emptyset _i.
Always there.is pre-civil war before of that there.is one.
- (40) a. *Hay ante-[ojos]_i para ponerlos delante de ellos_i.
There.are before-eyes to put-them in.front of them.
- b. *Hay un tras-[patio]_i para entrar a él_i.
There.is a back-courtyard to enter to it.
- c. *Siempre hay pre-[cognición]_i antes de que haya una \emptyset _i.
Always there.is pre-cognition before of that there.is one.

D) ORDERING OF PREFIXES. A second piece of evidence has to do with the relative ordering of the two kinds of prefixes. As we see in (41), the PP-prefixes —which allow for figure and ground readings— are introduced as low modifiers, while the pP-prefixes are heads that take the DP as their complement. To the extent that the structure determines the linear ordering, we expect pP-prefixes to be always external to PP-prefixes. This is borne out (42).

(41) [_{PP} anti-... [_{DP}[_{NumP} [_{AP} ... [_{RelP} [_{PP} pre-...] Rel⁰ NP]]]]]

- (42) a. anti-pre-cognición, ‘opposed to pre-cognition’
a’. *pre-anti-cognition
- b. pro-super-índice, ‘in favour of having superindexes’
b’. *super-pro-índice

A related prediction is that the second prefix attached to an already prefixed one must be projected as a pP —as the RelP position has been used by the first prefix—, and therefore will change the syntactic distribution of the noun. This is also borne out:

- (43) una notación pre- [super-índices]
a notation pre- super-indexes ‘a pre-superindexes notation’

E) POSITIONAL DIFFERENCES IN BASQUE. The third piece of evidence comes from Basque. Gràcia & Azkárate (2000: 64-65) report that the same adposition can be a prefix when the base is interpreted as a figure (and thus the structure must be 19 in our analysis) and a suffix when it must be interpreted as a ground (corresponding to 36). (44) illustrates this generalization.

- (44) a. *aurre-izate*
pre-existence, ‘existence before something’
- b. *historia-aurrea*
history-pre, ‘pre-history, something before history’

In our proposal, this difference follows. Remember that the forced ground reading involves pP, a functional head that must assign case to the DP. (44b) corresponds to this structure; here, the DP *historia* and the pP *aurre-* enter into a case-assignment relation, as the [*i*φ] of the DP check the [*u*φ] of the pP. As happens generally in Basque, where all case marking must appear to the right of the DP, the DP moves to the pP projection in the operation.

- (45) [_{PP} [_{DP} *historia*]_{*i*φ} p⁰ [_{PP} P⁰ [_{DP} *historia*]]]

Thus, *aurre-* materializes as a suffix, as DP moves to pP. In (44a), on the other hand, *aurre-* is a low modifier of the N, and as such part of the NP. NP movement would carry the modifier with it, and it would remain as a prefix. As it does not assign case to the N *izate*, there is no reason for N to move to its left, from where the ordering difference emerges.

- (46) [_{RelP} [_{PP} *aurre-* pro] Rel⁰ [_{NP} *izate*]]

3.4. Summary

I have argued that we have two structures for the PPrefs, which minimally contrast in whether they are projections of P or p. All the other differences follow from here. If the prefix is PP, a lexical head, it cannot assign case to its ground, and then this ground must be a PRO (47a), and never a DP (47b), because then this DP would not get case assigned. It follows that the base noun in the prefixed word cannot be the prefix’ ground; thus, the structure in (47a) is introduced as a modifier of the noun. If the prefix is pP, a functional head with [*u*φ], then the ground cannot be a PRO (47c), because this unit lacks interpretable φ features and, in that case, the prefix would not check its uninterpretable features, leading to a crashing derivation. The ground of pP must be DP (47d), because this category contains the agreeing features. It follows that such prefixes must be introduced high in the structure, as heads that dominate DPs compulsorily interpreted as grounds.

- (47) a. [PP [PRO]]
 b. *[PP [DP]]
 c. *[pP [PP [PRO]]]
 d. [pP [PP [DP]]]

The structure in (47a) corresponds to the prefix in the cases in which it does not change the syntactic distribution of the base; (47d) corresponds to the cases in which the prefix changes their distribution. No other combination of layers of P and different grounds is grammatical, basically due to case assignment.

A prefix which denotes time and place contains a PP with enough conceptual information, and thus is compatible both with (47a) –as in *pre-coma*, *pre-cognition*- and (47d) –as in *pre-[civil war]*-. A prefix which must denote an attitude contains a PP without enough conceptual information and is thus compatible only with (47d), because it requires pP to have some meaning –as in *anti Berlusconi*-.

4. Conclusions

I started this paper noticing that a subclass of prefixes, PPrefs, could be assimilated to prepositions, but that there existed some problems against doing it. Our proposal has been to treat most prefixes as reduced prepositions (consisting only of PP as opposed to pP + PP), introduced as very low noun modifiers. From here it follows that a) they will not change the syntactic distribution or the semantic type of the base, as they are not heads; b) they will not hold a direct syntactic relation with their bases, which will be able to get both a figure and a ground interpretation; c) they will not have the distribution of normal prepositions, as they are lacking the functional layer. Under some circumstances, prefixes cannot be reduced prepositions, and in this case they must contain pP and, thus, syntactically behave as expected from a head that a) combines with a whole DP, in compliance with the Fseq that places Ps on top of DPs; b) changes the distribution of the base noun, that now can be a noun modifier, as the whole is defined as pP; c) establishes a direct relationship with the DP, which is its complement and, thus, must be interpreted as the base.

In other words, the properties that some prefixes lack with respect from prepositions follow from the fact that in some cases they lack the pP layer. Absence of this layer implies absence of case-assignment and, therefore, it means that the preposition must take a PRO as ground, in such a way that the base noun is not taken as complement.

Our analysis explains the differences between PPrefs and prepositions a) without treating them as two separate categories; b) without giving up the Fseq or the normal selectional requisites of the heads involved and c) without positing that some structures are created in the lexicon, by morphology.

This article does not say anything about all the remaining prefixes, that is, those that cannot be considered PPrefs. I do not believe that this is a shortcoming; rather

the contrary. As I pointed out at the beginning, the object known in morphology as ‘prefix’ has been defined by a purely positional criterion. We now know that the positional criterion is not reliable, and therefore we can expect that the objects traditionally called ‘prefixes’ do not form a natural class, because the properties used to identify them are such that we do not expect any deep grammatical property to follow from them. Left for further research, then, are all the other objects classified as ‘prefixes’ which might not fall on the prepositional class.

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