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Animacy restrictions without animacy features: The case of strong pronouns in French and Spanish

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When used as complements in prepositional phrases, French (and to a certain extent also Spanish) strong and null pronouns seem to differ in animacy: Typically, strong pronouns have human antecedents and null pronouns inanimate ones. This raises the question of whether animacy features are part of the feature content of French and Spanish pronouns. We address this question in two steps: We first present gradient acceptability data from two experiments (one on French and one on Spanish) in which we scrutinize the effect of the availability of an alternative null pronoun on the animacy restrictions of the strong pronoun and we show that there is indeed such a competition effect. We then introduce two potential analyses of the data, one relying on the strong pronoun's gender features, the other assuming animacy features on the pronouns. We assess these analyses on conceptual grounds and by developing a Stochastic Optimality-Theoretic analysis. We show that the gender-based analysis is preferable to the animacy-based one as the former is more economical and better captures the gradient acceptability data. The observed animacy restrictions thus do not result from animacy features. Since the two analyses also make different predictions concerning the type of competition effect, evaluating the gender- and the animacy-based analysis allows us to determine the exact nature of the competition effect. We argue that in the empirical domain investigated, competition manifests itself as blocking (the availability of one expression blocks another) and not as boosting (the unavailability of one expression boosts another).

1 Introduction

In Romance languages, pronoun inventories are characterized by a number of categories such as person, number, case, gender etc. (Pescarini 2021a; Cardinaletti 2024). For example, the French (nominative) personal pronouns in (1) show the relevance of person and number distinctions in that language.

(1) French personal pronouns

	singular	plural
1st	*je*	*nous*
2nd	*tu*	*vous*
3rd	*il/elle*	*ils/elles*

Despite their intuitive nature, descriptions as in (1) leave out the question of whether the respective distinctions (singular vs. plural or between 1st, 2nd and 3rd person) correspond to the pronouns' feature content, i.e., whether every descriptively identifiable distinction is part of the features which make up the pronouns. Harley & Ritter (2002: 486), for example, argue for a feature geometry in which the 3rd person is not represented as a feature but manifests itself as the absence of the participant-related features *speaker* or *addressee*. Questions about the feature content of pronouns become especially pressing in cases of pronoun flexibility, i.e., cases where the categories (and distinctions) encoded by a pronoun may be hard to pin down even descriptively. Animacy-related distinctions in the pronominal domain are especially puzzling in this respect.

Minimal pairs as the one in (2) suggest that French strong and null pronouns, as complements in PPs, differ in terms of animacy: strong pronouns are [+human], while null pronouns are [–animate]. However, counter examples as in (3) and (4) call into question animacy as a relevant distinction for strong vs. null pronouns.

(2) a. Marie$_1$, j' étais venu avec elle$_1$ / $^?$Ø$_1$.
Marie I was come with STRG.F.3SG/NULL
'Marie, I came with her/Ø'

b. Cette valise$_1$, je voyage toujours avec $^?$elle$_1$ / Ø$_1$.
this suitcase I travel always with STRG.F.3SG/NULL
'This suitcase, I always travel with it/Ø'
(Zribi-Hertz 1984a: 65; modified)

(3) Il retira sa perruque$_1$, qui lui tenait chaud, s' éventa avec elle$_1$, […]
he removed his wig which him held warm 3SG.REFL fanned with STRG.F.3SG
'He removed his wig, which kept him warm, and fanned himself with it'
(Troyat Henri, *Les dames de Sibérie*, 1962; modified after Danell 1973)

(4) Les marins revinrent [...] chercher leur camarade$_1$. [...] Ils disparurent avec
the sailors returned to_search their comrade they disappeared with
Ø$_1$;
NULL
'The sailors returned [...] to look for their comrade. They disappeared with him;'
(Chamoiseau Patrick, *Texaco*, 1992; Frantext, ATILF (2022); modified after Heidinger 2019)

The nature and syntactic status of the implicit argument of such prepositions has already been addressed in Zribi-Hertz (1984a), mainly focusing on the distinction between null pronouns and gaps/ellipsis. More recently, this issue has been addressed in Authier (2016) and Heidinger (2024). Based on their findings, Heidinger & Troberg (accepted) suggest that at least three types of implicit arguments should be distinguished in the prepositional domain: 1) Implicit arguments which are syntactically inactive (i.e., unprojected) (e.g., implicit arguments of French *pour* 'for' as discussed in Authier 2016); 2) Syntactically projected implicit arguments which are null pronouns; 3) Syntactically projected implicit arguments which are the result of ellipsis. For a more detailed description of these three types of implicit arguments we refer the reader to Section 1 of the Appendix (available at https://osf.io/yufbv/files/gw6fp).

In this article, we follow this distinction, but we are only dealing with the kind of implicit argument defined in 2), which we will refer to as *null pronouns* in the remainder of the article. We will address the question of whether strong and null pronouns differ with respect to animacy, and more concretely whether a [+human] feature must be assumed as part of the feature content of strong pronouns. The comparative perspective on French and Spanish allows to address this question in languages with pronominal systems which show considerable overlap, but at the same time crucially differ in the distribution of null pronouns in PPs, where French is more tolerant than Spanish (interestingly, the opposite is true for null pronouns in subject position). Additionally, the choice of the two languages is motivated by the large body of research on animacy and pronouns (cf. Section 2) which forms a solid starting point for an investigation of the more specific question of animacy features as part of the feature content. To answer this question, we will scrutinize the first type of the above counterexamples, namely the use of strong pronouns for inanimates, and pay special attention to contexts where the null pronoun is not available. We illustrate this latter case in (5): the strong pronoun is used as a complement of prepositions which do not allow for null pronouns (*par* 'by' and *vers* 'towards'). In the absence of the null pronoun, the strong pronoun seems unrestricted in terms of animacy.

(5) a. Ce pays$_1$, j' ai toujours été attiré par lui$_1$ / $^?$Ø$_1$.
this country I have always been attracted by STRG.M.3SG/NULL
'This country, I have always been attracted by it'

b. Ce pays$_1$, quelque chose d' indéfinissable m' attire vers
this country some thing of undefinable 1SG attracts towards
lui$_1$ / $^?$Ø$_1$.
STRG.M.3SG/NULL
'This country, something indefinable draws me to it'
(Zribi-Hertz 2000: 674; modified)

Building on insights from Zribi-Hertz (2000) we will focus on the presence or absence of a weak competitor (null or clitic) as a relevant factor for the animacy restrictions of strong pronouns. We will present data from parallel acceptability experiments for French and Spanish (Da Cunha & Heidinger accepted) and put forward a constraint-based analysis of these data in Stochastic Optimality Theory (Boersma 1999; Hayes 2000; Boersma & Hayes 2001). As will become clear, both conceptual and empirical arguments favor an analysis without animacy features as part of the feature content of French and Spanish strong pronouns. Considering the impact of competition on animacy restrictions together with the issue of feature content allows us to further specify the competition effect at play. We will argue that in the empirical domain of pronouns in PPs, competition manifests itself as blocking and not as boosting.

To illustrate these two subtypes, we must first clarify the term *competition effect*. It describes a situation where the acceptability of a linguistic expression E_1 (sentence, word, etc.) does not result from the properties of that expression E_1 alone, but also depends on the properties of other expressions E_2, E_3 etc. (Müller & Sternefeld 2001: 1). For instance, in the English comparative, analytical forms (such as *more hot*) are ungrammatical if a synthetic form (such as *hotter*) exists. We take the ungrammaticality of *more hot* to be a competition effect since it does not follow from the isolated properties of *more hot* but hinges on the existence of another form in the language, namely *hotter*. To put it in more common terms: *hotter* blocks *more hot* (which in this case can be captured by the Elsewhere Condition (Kiparsky 1973), since the rule for the synthetic comparative is more specific than the rule for the analytic one).

A second type of competition effect can be illustrated with data from French reflexive pronouns in (6). While the reflexive pronoun in (6a) is limited to a coreferential interpretation with the subject (*Marie*), the non-reflexive pronoun in (6b) can only be interpreted as referring to somebody/something else than *Marie*, i.e., it has a disjoint reference interpretation. These facts are captured by Principle A and Principle B of Binding Theory (Chomsky 1981).

(6) a. Marie$_1$ se$_{1/*2}$ lave.
Marie 3SG.REFL wash
'Mary washes herself'

b. Marie$_1$ la$_{*1/2}$ lave.
Marie 3SG.NONREFL wash
'Mary washes her'

Interestingly, however, non-reflexive pronouns may receive a reflexive interpretation in the absence of a dedicated reflexive form. In the paradigm of French personal pronouns such a dedicated reflexive form is missing in the 1st and 2nd person. As shown in (7), the pronoun *me* can receive both reflexive and non-reflexive interpretations (such cases are extensively discussed in Rooryck & Vanden Wyngaerd 2011: Section 2).

(7) a. Je$_1$ me$_1$ lave. *reflexive interpretation*
I 1SG wash
'I wash myself'

b. Marie$_1$ me$_2$ lave. *non-reflexive interpretation*
Marie 1SG wash
'Mary washes me'

While in the case of the comparative, availability of E$_1$ (*hotter*) blocks E$_2$ (*more hot*), the data involving (non-)reflexives in (7) is better described such that the unavailability of E$_2$ (dedicated reflexive form in 1SG) boosts E$_1$ (*me*), i.e., its range of uses is extended. Accordingly, in addition to the well-established term *blocking*, we use the term *boosting* to keep these two types of competition effect apart. As stated above, we will show that in our experimental data competition manifests itself as blocking and not as boosting.

To summarize, we will address the following research questions (RQ) in our article:

- RQ1: Does the presence or absence of competition have an effect on the animacy restrictions of strong pronouns?
- RQ2: Does the presence or absence of competition have the same effect across languages?
- RQ3: What do competition effects tell us about the feature content of pronouns (in terms of animacy)?
- RQ4: What type of competition is at play? Blocking or boosting?

The article is structured as follows. Section 2 provides the background for the present study; on the one hand it gives an overview of animacy-related competition effects and on the other it introduces two analytical options for pronoun flexibility which differ in whether they assume animacy features as part of the feature content of strong (and null) pronouns. Section 3 presents gradient acceptability data from two parallel experiments on competition effects and animacy restrictions in French and Spanish. In Section 4, we present our constraint-based analysis of these data in Stochastic Optimality Theory and interpret them in the discussion in Section 5 with respect to whether pronouns carry animacy features and with respect to the type of competition at play.

2 Background

2.1 Animacy restrictions and competition

Besides the alternation between strong and null pronouns as complements of prepositions, introduced in Section 1 for French and illustrated in (8) for Spanish, the two languages offer further means of pronominalization in the domain of PPs (Pescarini 2021b: 125–127).

(8) a. La casa$_1$, Pedro estaba delante de ella$_1$.
the house Pedro was in_front of STRG.F.3SG
'The house, Pedro was in front of it.'

b. La casa$_1$, Pedro estaba delante Ø$_1$.
the house Pedro was in_front NULL
'The house, Pedro was in front of it.'
(Zribi-Hertz 1986: 625; modified)

An option shared by both languages is that the preposition's complement takes the shape of a dative clitic and appears outside of the PP (typically adjacent to the finite verb). In both (9) and (10), the dative clitic (*le/lui*) in (9b-10b) roughly corresponds to the strong pronoun (*él/lui*) in (9a-10a).

(9) a. Se sentó enfrente **de él**.
3SG.REFL sat.3SG in_front of STRG.M.3SG
'She/he sat in front of him'

b. Se **le** sentó enfrente.
3SG.REFL CL.DAT sat.3SG in_front
'She/he sat in front of her/him'
(Fernández Soriano & Ordóñez 2024: 2; modified)

(10) a. Il a versé de l' eau **sur lui**.
he has poured PART water on STRG.M.3SG
'He poured water on him'

b. Il **lui** a versé de l' eau dessus.
he CL.DAT has poured PART water on
'He poured water on her/him'
(Porquier 2001: 126; modified)

Additionally, French prepositions *à* and *de* exhibit an alternation between a strong pronoun in complement position and a clitic pronoun substituting the whole PP (cf. (11) for the preposition *de*). While *lui* in (11a) pronominalizes *son frère* 'his brother' and is the complement of *de*, *en* in (11b) can be analyzed as pronominalizing the whole PP *de ce film* 'of this movie' (Kupferman 2021: 1025). Such PP-substituting clitics (*y* and *en*) are not available in Spanish.

(11) a. Jean a retrouvé son frère$_1$ et parle **de** **lui**$_1$.
Jean has found_again his brother and speaks about STRG.M.3SG
'Jean found his brother again and talks about him'
(Zribi-Hertz 2021: 1061; modified)

b. Jean a retrouvé ce film$_1$ et **en**$_1$ parle.
Jean has found_again this movie and CL.GEN speaks
'Jean found this movie again and talks about it'
(Zribi-Hertz 2021: 1062; modified)

The options are summarized in **Table 1**. In the following, we will concentrate on the alternation between strong and null pronouns, and where necessary we will use the term *weak* as a cover term for both null pronouns as in (8) and clitic pronouns as in (9b)-(11b).

	French	Spanish
Strong vs. null	✓	✓
Strong vs. dative clitic	✓	✓
Strong vs. PP-substituting clitic	✓	×

Table 1: Pronominalizations inside and outside of French and Spanish PPs.

In French, and to a lesser extent also in Spanish, the alternation between strong and null pronouns has been linked to animacy. Starting with French there is a vast body of literature linking the pronoun type to the animacy of the antecedent:[1] Strong pronouns are considered to (typically) refer to human antecedents (Sandfeld 1965; Pinchon 1972a; 1972b; Thun 1986; Jones 1996; Cardinaletti & Starke 1999; Dobrovie-Sorin 1999; Veldre-Gerner 2007; Adler 2012; Zribi-Hertz 2021; Heidinger 2023; Therrien 2023; Cardinaletti 2024). Null pronouns are considered to be (typically) restricted to non-human ones (Danell 1973; Zribi-Hertz 1984a, 1984b, 2000, 2021; Thun 1986; Wilmet 2003; Adler 2012; Poplack et al. 2012; Grevisse & Goosse 2016; Heidinger 2019; 2023; 2024; Tseng 2021).[2] Empirical evidence for such animacy restrictions come from a variety of data types including systematic corpus studies (Danell 1973; Poplack et al. 2012; Shimanskaya 2018; Heidinger 2019) and experimental studies (Shimanskaya 2018; Heidinger 2023; 2024). Heidinger (2019: 13) reports the following frequencies in a corpus of novels: as complements of *avec* 'with' and *sans* 'without', 3rd person strong pronouns have human

[1] In this article, we are concerned only with cases where the pronoun's interpretation is contextually solved, i.e., with an antecedent in the linguistic context (but see Bosque 2015 for a recent overview on the resolution of implicit arguments which includes other sources, such as the situational context).

[2] A similar restriction has been assumed for the clitics *y* and *en* (Kalmbach 2014; Pinchon 1972a; 1972b; Zribi-Hertz 2021: 1062). See Therrien (2023) for the absence of such restrictions on null pronouns in a variety of Ontario French.

antecedents in 96% of the cases while null pronouns have human antecedents in only 10% of the cases. Shimanskaya (2018) conducted a picture selection experiment to determine whether strong pronouns are interpreted as human or inanimate in ambiguous contexts. The results show a clear preference for allowing both interpretations, i.e., both a human and an inanimate antecedent, but unequivocal interpretations are more than twice as often human than inanimate (20 % vs. 8 %) (Shimanskaya 2018: 800).

As for the rigidity of these animacy restrictions, the above authors show considerable variation. The strong pronoun is categorically described as "limited to [+ human] interpretation" in Cardinaletti (2024: 210), while Zribi-Hertz states that strong pronouns with an animate antecedent are "more natural" (2021: 1061) than those with an inanimate antecedent, but that strong pronouns can refer to inanimates when no weak form is available (2021: 1062).

Turning to Spanish, the existing literature has typically focused on the animacy restrictions of strong pronouns. It has been assumed that strong pronouns are limited to [+ human] antecedents in subject and object positions, but not as complements in PPs. The PP context has been discussed as a syntactic context where the strong pronoun does not have a weak competitor, unlike in subject or object position. This might have to do with the fact that – unlike in French – null pronouns are not available with simple lexical prepositions such as *con* 'with' or *sin* 'without' (cf. (12), Zribi-Hertz 1986; Campos 1991; Fraga 2020; Troberg 2020) – except for cases of ellipsis/ background deletion (cf. Pavón 2023; Heidinger 2024).

(12)	Mi	sombrero$_1$,	vine	con	él$_1$ / *Ø$_1$.
	my	hat	came.1SG	with	STRG.M.3SG/NULL

'My hat, I came with it'
(Zribi-Hertz 1984b: 19)

Minimal pairs as in (13) illustrate this difference between subject position and complement position (of P) in Spanish (Alonso-Ovalle & D'Introno 2001). While in subject position the strong pronoun cannot be used with an inanimate antecedent (13a), it does not underlie such a restriction as a complement of the preposition *de* 'of/about' (13b).

(13)	a.	Devolverán	la	escultura$_1$	si	*ella$_1$ / Ø$_1$	se	puede	restaurar.
		return.3PL	the	sculpture	if	STRG.F.3SG/NULL	3SG.REFL	can	restore

'They will return the sculpture if it can be restored.'

b.	Parece	que	la	escultura$_1$	sabe	que	la	gente	habla	de	ella$_1$.
	seem.3SG	that	the	sculpture	knows	that	the	people	talk	about	STRG.F.3SG

'It seems that the sculpture knows that people talk about it.'
(Alonso-Ovalle & D'Introno 2001: 404)

Hence, while the literature on French has focused on the diverging animacy restrictions of strong and null pronouns in one and the same syntactic slot, namely as complements of prepositions, the literature on Spanish has focused on the diverging animacy restrictions of strong pronouns in different syntactic contexts: complement position in PPs vs. subject and object position.

The Spanish data in (12) and (13) already point to competition effects in the domain of animacy restrictions.[3] In the present case, the animacy restrictions of the strong pronoun seem to depend on the availability of a weak alternative. With Spanish simple prepositions, a null pronoun is not available and the strong pronoun can be freely used for inanimates (cf. Fernández Soriano 1999: 1220; Alonso-Ovalle & D'Introno 2001: 404; Pomino 2017: 702 for introspection-based confirmations, and Jensen 1973 and Heidinger 2024 for quantitative data from questionnaires and experiments respectively). Animacy restrictions in positions where weak competitors are available have been reported by Jensen (1973), Fernández Soriano (1999), Alonso-Ovalle & D'Introno (2001) and Pomino (2017).[4]

These empirical observations align with Zribi-Hertz's (2000) competition-based account of animacy restrictions in French: Only in the absence of a weak competitor can French strong pronouns be used irrespective of the antecedent's animacy. Recall (5) in Section 1 where the strong pronoun can be used with inanimates as a complement of *par* 'by' and *vers* 'towards' which do not allow for null pronouns. A case that seems particularly interesting for the role of competition in Spanish, and which has so far not been analyzed from this perspective, are spatial prepositions like *encima* (*de*) 'above', *debajo* (*de*) 'below' etc. (Pavón 2003; Fábregas 2007; Troberg 2020). The minimal pair in (14) is interesting in two respects: it shows (i) spatial prepositions which allow for both strong or null pronouns, and (ii) that the availability of the null pronoun does not degrade the acceptability of the strong pronoun with inanimates (cf. also Zribi-Hertz 1986: 625, and (8) above).

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[3] Although a full-fledged description of competition in the pronominal domain is outside the scope of this article, it should be mentioned that the absence of a weak competitor in the prepositional domain can rely on different factors: lexical factors, i.e., the preposition itself (*avec* vs. *vers*; *delante* vs. *con*), semantic factors (e.g., the comitative interpretation of *avec* allows the null pronoun while the manner interpretation does not), pragmatic factors (optimization of anaphora resolution using the gender and number features of strong pronouns), or register (formal vs. informal). Note further that competition effects in the pronominal domain are not limited to animacy. They have also been observed for semantic binding, and especially the possibility of bound variable interpretations for strong pronouns seems to depend on the availability of a weak alternative (Montalbetti 1984; Rigau 1986; Alonso-Ovalle & D'Introno 2001; Mayol 2010).

[4] In addition to the role of competition on animacy restrictions, which is the focus of the present article, it would also be interesting to study diatopic variation in animacy restrictions in more detail. An interesting piece of data mentioned by a *Glossa* reviewer comes from Caribbean Spanish. In this variety of Spanish, overt 3rd person subject pronouns can refer rather freely to inanimates:

(i) Dominican Spanish
A la cisterna mía ya no le falta agua. **Ella** tiene agua.
'My cistern doesn't lack water; it has water.'
(Toribio 2000: 320)

(14) a. Habría quien en La Moncloa buscó una mesa$_1$ para meterse
there_would_be who in La Moncloa searched a table to put_REFL
debajo de ella$_1$, […]
under of STRG.F.3SG
'Some people in La Moncloa looked for a table to get under it.'
(El Mundo, 15/12/1996; CREA, Real Academia Española (2008); modified)

b. Habría quien en La Moncloa buscó una mesa$_1$ para meterse
there_would_be who in La Moncloa searched a table to put_REFL
debajo Ø$_1$
under NULL
'Some people in La Moncloa looked for a table to get under it.'

We thus face the paradoxical situation that in Spanish PPs the availability of a null pronoun does not seem to trigger a competition effect, unlike in French (where it does). The empirical landscape in Spanish is however still unclear both with respect to the availability of the null pronoun and its consequences for the animacy restrictions of strong pronouns. Since both languages exhibit prepositions which allow (e.g., Sp. *debajo*, Fr. *avec*), and prepositions which disallow null pronouns as complements (e.g., Sp. *con*, Fr. *par*), we can test animacy-related competition effects in French and Spanish in a parallel fashion.

Although we treat prepositions like French *avec* and Spanish *debajo* on a par as concerns the availability of null pronouns, we acknowledge that there exist important differences between them (e.g., morphological complexity or necessity of *de* to introduce overt complements). We address the categorial status of expressions like *encima* (*de*) 'above', *debajo* (*de*) 'below' etc. in more detail in Section 2 of the Appendix (specifically the question whether they can be categorized as prepositions), available at https://osf.io/yufbv/files/gw6fp.

2.2 Pronoun flexibility and feature content

Pronouns are flexible expressions due to their minimal lexical content. A pronoun like *it* is restricted by person (3rd), number (singular), or animacy (non-human) but not by proper lexical content. Thus, *it* is already more flexible than lexical noun phrases such as *the house*, *the cat* etc. carrying the same grammatical features. This flexibility is further enhanced whenever grammatical or semantic distinctions are not constant. If one assumes that French and Spanish strong pronouns are [+human] to account for the preferences of these pronouns for human antecedents, then this feature cannot be constant given the many instances where strong pronouns have inanimate antecedents (cf. (3), (5), (12), (14) above). Similarly, if one assumes that null pronouns are [−human] or [−animate] this feature cannot be constant given that the null pronoun sometimes has a human antecedent (cf. (4), repeated as (15), and (16)).

(15) Les marins revinrent [...] chercher leur camarade$_1$. [...] Ils disparurent avec
the sailors returned to_search their comrade they disappeared with
Ø$_1$;
NULL
'The sailors returned [...] to look for their comrade. They disappeared with him;'
(Chamoiseau Patrick, *Texaco*, 1992; Frantext, ATILF (2022); modified after Heidinger 2019)

(16) Lucas$_1$ tocó el hombro de la persona que tenía delante Ø$_1$.
Lucas touched the shoulder of the person that had in_front NULL
'Lucas touched the shoulder of the person that he had in front of him.'
(Elorriaga, *Un tranvía en SP*, 2003; CORPES, Real Academia Española 2013; modified)

There are in principle two analytical options to account for both the default mappings between pronoun types and animacy and for the mismatches, i.e., strong pronouns referring to inanimates and null pronouns referring to humans. The first option would be to assume that animacy features are part of the feature content of these pronouns, and that in the case of mismatches some type of feature manipulation occurs (deletion of animacy features, non-interpretation of features etc.). Cardinaletti & Starke (1999) claim that strong, weak, and clitic pronouns differ with respect to their internal syntactic structure, with decreasing structural richness from strong to clitic pronouns. The [+human]-feature results from a C head, which is part of the structure of strong pronouns but is missing in weak and clitic pronouns. Dobrovie-Sorin (1999) attributes a special role to the grammatical gender features of strong pronouns. The gender features on strong pronouns identify an empty N-head as meaning *male/female individual* respectively, which causes the animacy restriction. The gender features of strong pronouns are thus "contentful", unlike the grammatical gender features of weak and clitic pronouns. Hence in both of these proposals animacy is encoded in the structure of strong pronouns. What is missing, however, is an account of deviations from the default, i.e., the use of strong pronouns for non-humans and inanimates.

The second analytical option would be to assume no animacy features on pronouns, hence there cannot be a mismatch between the feature content of the pronoun and the animacy of the antecedent. Building on insights from Zribi-Hertz (2000) we will argue that strong pronouns do not carry animacy features. This accounts in a straightforward manner for the possibility of using strong pronouns for inanimates. In such a proposal, however, one needs to find a way to account for the preference of strong pronouns for human antecedents. We will argue that this preference results from a faithfulness constraint which is violated whenever the semantic gender features of a human antecedent are not matched by grammatical gender features of the pronoun. Both the animacy- and the gender-based analysis are introduced in more detail in Section 4.[5]

3 Experimental studies

In this section we summarize two experimental studies on animacy related competition effects which were originally presented in Da Cunha & Heidinger (accepted). Although the summary provides all aspects of the experiments which are relevant for the constraint-based analysis in Section 4, we refer the reader to Da Cunha & Heidinger (accepted) for further information (especially on the inferential statistics supporting our descriptive interpretation of the data in Section 3.2).

3.1 Method

We conduct two acceptability judgment experiments on French and Spanish and follow the same procedure to design the experimental material in both languages. We use a 2×2 design manipulating two variables: PRONOUN TYPE and ANIMACY. The PRONOUN TYPE variable refers to the type of pronoun used as complement of a preposition. It has two levels: strong pronoun (*lui, elle* in French, *él, ella* in Spanish) or null pronoun. The ANIMACY variable refers to the animacy of the antecedent of the manipulated pronoun. This variable also has two levels: human or inanimate.[6] The design results in the 4 conditions in (17).

(17) Experimental conditions
human-strong, human-null, inanimate-strong, inanimate-null.

We create 16 items following this 2×2 design in each language. To test the relevance of competition we compared two contexts: one with competition between strong and null pronouns, the other without competition, allowing only strong pronouns. These two contexts are obtained by the manipulation of preposition type. We use introspective judgements drawn from the literature to establish these two sets of prepositions (Zribi-Hertz 1984a; 1984b; 1986; Troberg 2020; Tseng 2021 for French; Pavón 2003; 2023 for Spanish): with-competition prepositions *avec* 'with', *sans* 'without' in French, *delante* 'in front', *detrás* 'behind' in Spanish vs. without-competition prepositions *malgré* 'despite', *vers* 'towards' in French, *con* 'with', *sin* 'without' in Spanish. Hence, in addition to the two within-item variables PRONOUN TYPE and ANIMACY our design includes

[5] Unlike in Dobrovie-Sorin's (1999) proposal where the gender features of the strong pronoun are semantically interpreted, we do not assume any semantic gender features on the pronoun. Instead, strong pronouns carry grammatical gender features which may align with the antecedent's semantic gender features (*l'homme* 'the man' [male] ⇔ *lui* 'he/him' [masculine]).

[6] We use this binary distinction in order to create a maximal contrast for the levels of the variable ANIMACY. We are aware that more fine-grained distinctions can be made with respect to animacy and that the large (and very heterogeneous) domain of non-human animals is left out.

the between-item variable COMPETITION, which again has two levels: with-competition and without-competition items, with 8 items for each level.

All items follow the same structure, which we illustrate using (18). First, an initial frame-setting adjunct (*Près des falaises* 'near the cliffs') provides some general orientation. Next, a context part (*Rémi rejoint sa bouée* 'Rémi joins his buoy') introduces two singular lexical NPs (NP1 and NP2) in a transitive structure, NP2 being manipulated for animacy (human/inanimate). Finally, the critical part (*puis il nage avec* 'then he swims with it'), contains the preposition (Prep) manipulated for competition (with/without-competition) and the pronoun (Pro) manipulated for form (strong/null). Additionally, NP1 and 2 always differ in grammatical gender: if NP1 is feminine, NP2 is masculine, and conversely, if NP1 is masculine, NP2 is feminine (these two possibilities are equally distributed across the items).

(18) Près des falaises, Rémi$_{\text{NP1}}$ rejoint sa **bouée**$_{\text{NP2}}$ puis il nage <u>avec$_{\text{Prep}}$</u> Ø$_{\text{Pro}}$.
near of_the cliffs Rémi reaches his buoy then he swims with NULL
'Near the cliffs, Rémi reaches his buoy and swims with it.'

The item in (18) thus has the following properties in terms the experimental variables: inanimate × null × with-competition. The Spanish item in (19) displays the following properties: human × strong × with-competition.

(19) Antes de los exámenes, Ada$_{\text{NP1}}$ busca a **Fernando**$_{\text{NP2}}$ y se lamenta
before of the exams Ada looks_for DOM Fernando and REFL laments
delante de él.
in_front of STRG.M.3SG
'Before the exams, Ada seeks out Fernando and complains in front of him.'

To summarize, we created 16 items for each language, using a 4-conditions design (ANIMACY × PRONOUN TYPE). Among those, 8 items contain with-competition prepositions (*avec* 'with', *sans* 'without' in French, *delante* 'in front', *detrás* 'behind' in Spanish), and 8 items contain without-competition prepositions (*malgré* 'despite', *vers* 'towards' in French, *con* 'with', *sin* 'without' in Spanish).

The acceptability judgment task relies on a 5-point Likert scale ranging from *Absolutely unacceptable* to *Perfectly acceptable* with no additional labels in between. Participants read sentences one by one on a screen and rated the acceptability using the Likert scale. The item presentation follows the Latin-square method: each participant sees all the conditions and items, but is presented with each item in only one condition. The conditions are counterbalanced across participants, and the presentation order is randomized.

We recruited 32 participants in each language using the platform Prolific. We pre-screened participants based on demographic data to study a more homogeneous sample. We used the following criteria respectively: participants must be born and currently live in France/Spain, have French/Spanish nationality, have spent most of the time before turning 18 in France/Spain, have French/Spanish as their primary language and must be between 22 and 60 years old. As we did not use a control task in our experiments, we analyzed data for all 64 participants.

The group of 32 French participants includes 13 women and 19 men, with a mean age of 32 (SD = 8.1). The group of 32 Spanish participants includes 10 women, 1 non-binary and 21 men, with a mean age of 34 (SD = 9.7). Anonymized data and R scripts for the statistical analysis and supplementary results can be found on the OSF repository of this study: https://osf.io/yufbv/.

3.2 Results

We found effects of competition in both languages (**Figure 1**). In French, competition affects the interaction between animacy and pronoun type. In contexts with competition, where the two pronoun types are available, strong pronouns are more acceptable with human antecedents and null pronouns with inanimate antecedents. In contexts without competition, null pronouns are unacceptable, and strong pronouns are as acceptable with human as with inanimate antecedents.

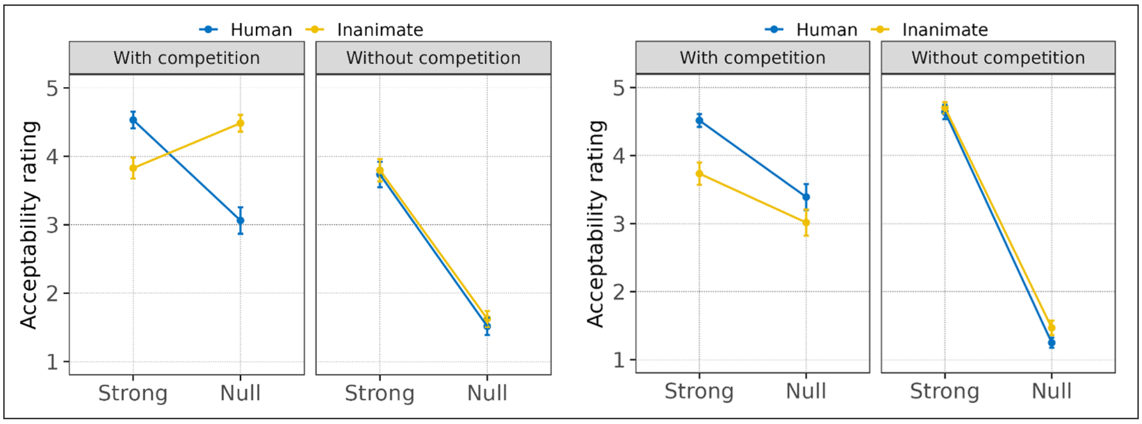

Figure 1: Mean acceptability ratings for French (left panel) and Spanish (right panel).

In Spanish, all factors (animacy, pronoun type and competition) interplay in two-way interactions. First, competition affects the acceptability of strong/null pronouns and inanimate/human antecedents. In contexts without competition, animacy does not play a role, but pronoun type does: strong pronouns are acceptable, and null pronouns are not. In contexts with competition, both types of pronouns are acceptable, with strong pronouns being still more acceptable, and animacy also has an effect: human antecedents are more acceptable. Finally, there is also an interaction between animacy and pronoun type: strong pronouns are more acceptable with human antecedents.

Taken together, the results for French and Spanish suggest that competition is a crucial factor to understand animacy restrictions on strong pronouns in PPs: animacy restrictions are present only in with-competition contexts, where null pronouns are available. In without-competition contexts, strong pronouns do not exhibit animacy restrictions in either language.

The main difference between French and Spanish, however, lies in the acceptability pattern of null pronouns in competition contexts. In French, null pronouns are more acceptable with inanimate antecedents than with human antecedents. As such, it seems that the availability of an acceptable null pronoun for inanimate antecedents makes the strong pronoun less acceptable in the same context. However, in Spanish, null pronouns are mildly acceptable, with no clear animacy preference. Despite this, even if the alternative null form is not better, strong pronouns in Spanish still exhibit a dispreference for inanimate antecedents. This shows that competition effects not only arise when a competitor is better (as in French), but also when a competitor is merely possible and even less acceptable (as in Spanish).

To further evaluate whether the acceptability of strong pronouns with inanimate antecedents correlates with the acceptability of the null competitor we define two measures: First, a measure of animacy restrictions on strong pronouns, Δ_{Acc}, corresponding to the acceptability difference between human and inanimate strong pronouns (20a). Second, Acc_{Null}, a measure corresponding to the mean acceptability of null pronouns (20b). The relationship between these two variables indicates how animacy restrictions on strong pronouns change with the acceptability of null pronouns.

(20) a. $\Delta_{\text{Acc}} = \text{Acc}_{\text{Human-Strong}} - \text{Acc}_{\text{Inanimate-Strong}}$
b. $\text{Acc}_{\text{Null}} = \text{mean}(\text{Acc}_{\text{Human-Null}}, \text{Acc}_{\text{Inanimate-Null}})$

Figure 2 represents the relationship between Δ_{Acc} and Acc_{Null} in French and Spanish across items (16 observations per language). We observe positive correlations: when the null pronoun gets more acceptable, the acceptability difference between human and inanimate gets bigger, i.e., the animacy restriction gets stronger. We report the Pearson coefficients of linear correlation: 0.42 in French and 0.30 in Spanish. These can be considered as weak to moderate correlations (Cohen 1992; Gignac & Szodorai 2016). In addition to the stronger correlation found in French, we also note that the slope of the regression line is bigger in this language ($\beta = 0.37$) than in Spanish ($\beta = 0.17$). Overall, without-competition items cluster at the left of the Acc_{Null} scale ($\text{Acc}_{\text{Null}} < 2$), with a null Δ_{Acc} ($\Delta_{\text{Acc}} \approx 0$), corresponding to the absence of animacy restrictions. For with-competition items, both Acc_{Null} and Δ_{Acc} are higher, and they show more variation.

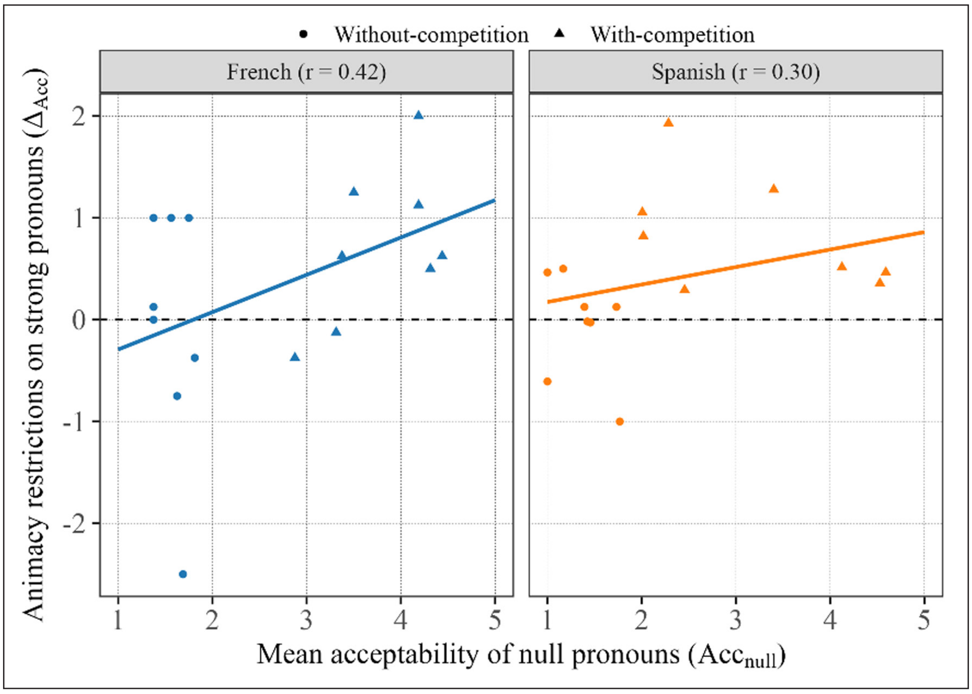

Figure 2: Relation between Δ_{Acc} and Acc_{Null} across items in French and Spanish.

The empirical results that need to be accounted for in the subsequent formal analysis are thus the following:

– Animacy restrictions on strong pronouns exist in contexts where a weak competitor is available (these restrictions degrade the acceptability, but do not render strong pronouns with inanimate antecedents ungrammatical).
– Animacy restrictions on strong pronouns disappear when the strong pronoun is used in a context where no weak competitor is available.
– Some prepositions do not allow for null pronouns as complements.
– French and Spanish differ with respect to the status of null pronouns as complements in PPs.

4 A constraint-based analysis

In this section, we develop a formal analysis of the experimental data presented Section 3.2. This analysis aims to capture the role and exact nature of animacy-related competition effects and to inform about whether animacy restrictions follow from animacy features as part of the feature content of strong and null pronouns. To do this, we proceed in two steps. We first introduce two accounts within the classical Optimality Theory (OT) framework. We formalize the respective constraints and evaluate them on conceptual grounds (Section 4.1). We then implement both analyses in Stochastic Optimality Theory (Boersma 1999; Hayes 2000; Boersma & Hayes 2001) and test them against the actual experimental data (Section 4.2). As will become apparent, the account which relies on the pronouns' gender features is superior both conceptually and empirically to the one assuming animacy features as part of the feature content of strong and null pronouns. Since these two analyses also make different predictions with respect to the type of competition effect involved, we conclude that in this empirical domain, competition manifests itself as blocking and not as boosting.

Note that the following analysis is restricted to pronouns in complement position of prepositions as complement and subject positions show clear differences. For example, we observe a cross-linguistic asymmetry between null pronouns in subject (Spanish > French) vs. complement position (French > Spanish). On top of that, specific constraints of our analysis seem to be ranked differently depending on the pronoun's syntactic position (e.g., the economy constraint introduced in 4.1 seems to outrank the gender-based faithfulness constraint favoring strong pronouns only in subject position).

4.1 Introducing two potential analyses: animacy faithfulness vs. gender faithfulness

In our constraint-based analysis, we adopt an optimality-theoretic approach to competition (Bresnan 2001a, 2001b). We follow standard assumptions about the components of a grammar in Optimality Theory (Prince & Smolensky 1993) according to which a grammar includes:

- A set of constraints *Con*, which are universal, violable, and ranked on a language-specific basis;
- A generator *Gen*, which takes input forms to generate a set of candidates;
- An evaluator *Eval*, which evaluates the set of candidates against a constraint ranking to yield an output from the input (which is then called the *optimal candidate*).

In the context of optimality-theoretic syntax, inputs and outputs have received different representations depending on the specific formal framework used together with OT. In transformational OT frameworks, inputs and outputs correspond to derivational steps in a syntactic structure before the PF/LF interfaces (Grimshaw 1997; Legendre et al. 1998; Müller & Sternefeld 2001; Speas 2001). In OT-LFG (Bresnan 2000), inputs are grammatical feature matrices (f-structures), which are paired in the outputs with constituency tree realizations (c-structures). Using Distributed Morphology, Trommer (2001) considers inputs to be sets of morphological features, and outputs to be inserted Vocabulary Items. We remain here agnostic regarding these different options, hoping that our analysis can be easily transposed into different frameworks.

To first introduce the two analyses and their respective constraints, we will simplify the picture offered by our experimental results, considering only the preference for either the strong or null pronoun (cf. **Table 2**), rather than relying on the gradience of acceptability data. We postpone the integration of the actual gradient acceptability judgments to the analysis within Stochastic Optimality Theory (Section 4.2).

Language	**Competition**	**Animacy**	**Pronoun type**
French	Yes (*avec, sans*)	Human	Strong > null
		Inanimate	Null > strong
	No (*malgré, vers*)	Human	Strong > null
		Inanimate	Strong > null
Spanish	Yes (*delante, detrás*)	Human	Strong > null
		Inanimate	Strong > null
	No (*con, sin*)	Human	Strong > null
		Inanimate	Strong > null

Table **2**: Preferred mappings between animacy and pronoun type (based on data from Section 3.2).

Given that this article deals with the alternation between strong pronouns and null pronouns as complements in PPs, we assume here that inputs consist of a preposition and an abstract pronoun (annotated as *Pro*, following Speas 2001), the latter being potentially associated with some features (such as animacy). We consider two candidates as possible realizations for *Pro*: a strong pronoun (represented as LUI in French and ÉL in Spanish) or a null pronoun (Ø).

We start by introducing two *structural constraints* which are directly linked to the two types of pronouns in the candidate set.[7] In the case of strong and null pronouns, two opposing constraints favor either one type or the other: *STRONG and *NULL. Crosslinguistic distribution suggests that strong pronouns constitute the unmarked type of pronoun compared to weaker pronouns (weak, clitic, null etc.): while no language lacks "free" pronominal forms, some languages lack weak, clitic, or null pronominal forms (Bresnan 2001b). This can be explained if *NULL, which penalizes null pronouns, is ranked above *STRONG in those languages where only strong pronouns are found. At the same time, we observe that in languages which do have weak pronominal forms there is a tendency to use weaker pronouns (weak, clitic, null etc.) instead of strong ones. This preference can be considered as a particular instance of a more general economy

[7] Structural constraints are universal constraints favoring or disfavoring certain structures. Such structural constraints only deal with the properties of the candidates (and not, for example, with the relation between inputs and candidates).

principle (e.g., Avoid Pronoun (Chomsky 1981), Structural Economy Principle (Safir 1993) or Minimize Structure (Cardinaletti & Starke 1999); see also Zribi-Hertz (2000) for its relevance in the prepositional domain). In those languages, *STRONG would be ranked above *NULL, hence disfavoring the use of strong pronouns.

(21) a. *STRONG: Avoid strong pronouns
b. *NULL: Avoid null pronouns

Obviously, these two constraints are not sufficient to account for the data since either ranking would result in only strong pronouns or only null pronouns to be used (or be acceptable), whereas our data show that both types are possible in French and Spanish. The remaining necessary constraints will be introduced in the following paragraphs.

A key observation about the distribution of null pronouns in French and Spanish PPs is that it is linked to the preposition itself (this was also the premise of distinguishing with-competition from without-competition contexts in the experiments reported in Section 3). Still, it is not entirely clear which factors determine whether a preposition (dis)allows null pronouns (cf. Heidinger & Troberg (accepted) for a recent comparative overview).

In Spanish, the morphological structure of the preposition seems to be a good predictor in that only morphologically complex prepositions (*encima*, *delante*, *detrás* etc.) allow for null pronouns (Zribi-Hertz 1984b; 1986; Pavón 2003; Fraga 2020; cf. Campos (1991) on *para* 'for' being a potential exception). The nominal component of complex prepositions seems to be relevant in that the null pronoun in such cases is the complement of the noun (within the morphologically complex preposition)[8] (cf. Fernández Soriano & Ordóñez (2024) for analysis of *detrás*, *delante* etc. containing an internal preposition plus a nominalizing null suffix, and Troberg (2020) on the nominal component of complex prepositions in French). Another proposal for Spanish null pronouns with complex prepositions (which also relies on morphological complexity) comes from Fraga (2020: 28) who suggests that "big Ps" allow for null pronouns because the omission of the complement of a head must be "supported by a clitic", which according to her is *de-* in the case of complex prepositions.

In French, the distribution of null pronouns in PPs is more complicated (Zribi-Hertz 1984a; 1984b; 1986; Troberg 2020; Tseng 2021; Heidinger & Troberg accepted). Morphologically complex prepositions (e.g., *en face*) seem to generally allow for null pronouns and simplex but semantically weak prepositions (e.g., *à*, *de*, *en*) disallow null pronouns. There is however a third and heterogeneous class: simplex but semantically strong prepositions, which show a mixed behavior as some of them (e.g., *avec*, *sans*) allow for null pronouns, while others (e.g., *parmi*, *chez*) do not.

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[8] We are grateful to a *Glossa* reviewer for drawing our attention to the relevance of the nominal component.

Given this situation and the fact that our goal is not to account for which prepositions (dis)allow null pronouns, we will use a constraint LEX which delegates the availability of null pronouns on the idiosyncratic lexical properties of individual prepositions (Bresnan 2001b).

(22) LEX: Avoid null pronouns with prepositions which lexically disallow them

The three constraints introduced so far are relevant to both analyses that will be introduced in the following. The type of constraint that distinguishes these two analyses from each other are faithfulness constraints. Such constraints demand that features specified in the input are also present in the output (the output needs to be 'faithful' to the input). Setting up these constraints requires to assume features on the input and to assign specific features to strong and null pronouns (as the two pronoun types of the output candidates). Based on the features that are decisive for the analyses we dub the analyses *animacy faithfulness* vs. *gender faithfulness*.

In the *animacy faithfulness* analysis, pronouns are specified with animacy features: strong pronouns are [+human] and null pronouns are [–animate]. The faithfulness constraint evaluating the correspondence between input and output animacy is $\text{FAITH}_{\text{ANIMACY}}$ (23).

(23) Animacy Faithfulness Analysis:
  a. Strong pronouns are specified [+human]
  b. Null pronouns are specified [–animate]
  c. $\text{FAITH}_{\text{ANIMACY}}$: animacy features in the input are represented in the output

With this additional constraint, we can now account for the use of strong and null pronouns in French PPs with human and inanimate antecedents. Beginning with the expression of human and inanimate complements with with-competition prepositions (here: *avec*), the empirical observation to account for is that strong pronouns are preferred over null pronouns with human antecedents and that null pronouns are preferred over strong pronouns with inanimate ones (cf. Section 3.2 and **Table 2**). **Tableaux 1** and **2** show the constraint violations and constraint rankings necessary to account for these data.[9] Just considering the constraint violations of the candidates, **Tableau 1** shows that either $\text{FAITH}_{\text{ANIMACY}}$ or *NULL is ranked above *STRONG. The violations in **Tableau 2** show that either $\text{FAITH}_{\text{ANIMACY}}$ or *STRONG is ranked above *NULL. Taken together the violations in **Tableaux 1** and **2** show that $\text{FAITH}_{\text{ANIMACY}}$ is ranked higher than both *NULL and *STRONG. This is represented in **Tableaux 1** and **2** by the relative positions of the constraints (the highest (= leftmost) position of LEX will be motivated below). The ranking between *NULL and *STRONG cannot be determined based on the data from **Table 2**.

[9] The input to the OT grammar is written in italics in the top left corner of the tableau. The set of candidates is found below the input, with the symbol '☞' indicating the optimal candidate. Constraints are displayed from left to right starting with the highest ranked.

avec Pro$_{[+human]}$ **'with Pro'**	**LEX**	**FAITH**$_{ANIMACY}$	***STRONG**	***NULL**
☞ avec LUI$_{[+human]}$			*	
avec Ø$_{[-animate]}$		*!		*

Tableau 1: Human complements of with-competition prepositions in French (Animacy faithfulness analysis).

avec Pro$_{[-animate]}$ **'with Pro'**	**LEX**	**FAITH**$_{ANIMACY}$	***STRONG**	***NULL**
avec LUI$_{[+human]}$		*!	*	
☞ avec Ø$_{[-animate]}$				*

Tableau 2: Inanimate complements of with-competition prepositions in French (Animacy faithfulness analysis).

The second type of preposition, i.e., the one which does not allow for null pronouns, is exemplified with *vers* 'towards' in **Tableaux 3** and **4**. Recall that with such prepositions the use of the null pronoun violates LEX, i.e. the prepositions' ban on null pronouns.[10] Given that FAITH$_{ANIMACY}$ is ranked higher than both *NULL and *STRONG the constraint violations in **Tableau 3** show that LEX is ranked higher than FAITH$_{ANIMACY}$. The candidate LUI$_{[+human]}$ is optimal despite it being unfaithful to the *Pro*$_{[-animate]}$ input. **Tableau 4**, with a human input, does not provide further insights on constraint rankings, but it confirms the ones established so far. Hence, the relative ranking of *NULL and *STRONG remains open, and it will be the analysis of the gradient acceptability data (Section 4.2) that informs about their ranking.

vers Pro$_{[-animate]}$ **'towards Pro'**	**LEX**	**FAITH**$_{ANIMACY}$	***STRONG**	***NULL**
☞ vers LUI$_{[+human]}$		*	*	
vers Ø$_{[-animate]}$	*!			*

Tableau 3: Inanimate complements of without-competition prepositions in French (Animacy faithfulness analysis).

vers Pro$_{[+human]}$ **'towards Pro'**	**LEX**	**FAITH**$_{ANIMACY}$	***STRONG**	***NULL**
☞ vers LUI$_{[+human]}$			*	
vers Ø$_{[-animate]}$	*!	*		*

Tableau 4: Human complements of without-competition prepositions in French (Animacy faithfulness analysis).

[10] An alternative to LEX would be to consider that the structural constraint against null pronouns (*NULL) is ranked differently depending on the prepositions (in our experiment: higher with *vers/malgré* than with *avec/sans*). However, in OT constraint rankings are not supposed to vary by lexical item (but rather by language/language variety).

Taken together **Tableaux 3** and **4** also capture the competition effect on the animacy restrictions of the two types of pronouns. Crucially, the acceptability of one form (strong pronouns) depends on the acceptability of another form (null pronouns). The absence of a null competitor enhances the functional range of the strong pronoun with prepositions like *vers* or *malgré*. As for the specific type of competition effect, this scenario corresponds to what we have called *boosting* in Section 1: a form specified for a restricted context (here: [+human]) appears in a context which is normally not meant for it (here: [–animate]).

The final set of constraints assumed in the Animacy Faithfulness analysis is thus the following:

- LEX, which ensures lexical requirements to be respected
- $\text{FAITH}_{\text{ANIMACY}}$, which ensures the input-output correspondence for animacy features
- *STRONG and *NULL, structural constraints which regulate the emergence of strong and null pronouns.

And their ranking in French is the following: LEX $\gg$ $\text{FAITH}_{\text{ANIMACY}}$ $\gg$ {*STRONG, *NULL}

The alternative analysis, inspired by Zribi-Hertz (2000), considers that neither strong nor null pronouns are specified for animacy, i.e., animacy is not part of the pronouns' feature content. In this analysis, the observed animacy effect of strong/null pronouns relies on gender, and the asymmetric specification of the two pronoun types in this respect: strong pronouns, not null ones, carry gender features.[11] This establishes a privileged relation between human referents and strong pronouns since only human antecedents carry *semantic* gender features (female/male) and only strong pronouns carry *grammatical* gender features (masculine/feminine). We thus hypothesize that the gender feature of strong pronouns is faithful to the semantic gender of their antecedent.[12] This second analysis thus comes with a different faithfulness constraint: $\text{FAITH}_{\text{GENDER}}$ (24a.).

(24) Gender Faithfulness Analysis:
  a. $\text{FAITH}_{\text{GENDER}}$: semantic gender features of the input are represented in the output
  b. Strong pronouns are specified for grammatical gender

[11] As is well known, not all strong pronouns express gender in the two languages: In French, 1st and 2nd person are not distinguished for gender; in Spanish, 1st and 2nd person singular are not distinguished for gender, and, additionally, the 3rd person singular has the neuter form *ello*. These cases are, however, not relevant for our analysis since we focus on 3rd person pronouns and the constraint $\text{FAITH}_{\text{GENDER}}$ concerns the onomasiological perspective and takes the referent's semantic gender as a starting point.

[12] To achieve this correspondence between grammatical and semantic gender features, it would be necessary to assume that human-referring expressions derive a semantic gender feature from their grammatical gender feature. This would require an additional harmonic constraint (i), which would be independently needed to account for the semantic gender feature of nouns for example.

(i) $\text{HARM}_{\text{GENDER}}$: GRAM-GENDER $\Leftrightarrow$ SEM-GENDER

The empirical facts that need to be accounted for are the same as with animacy faithfulness. First, in the case of *avec*, null pronouns are preferred for inanimate antecedents. This follows from the *STRONG ≫ *NULL ranking (**Tableau 5**). In the case of human antecedents, the use of the null pronoun is circumvented by the higher ranking of FAITH$_{\text{GENDER}}$ (**Tableau 6**), which forces the use of a strong pronoun. It is thus better to be faithful to the gender specification (represented by the [+gender] feature), than to avoid strong pronouns. The position of LEX relative to the other constraints will be described in **Tableaux 7** and **8**.

avec Pro$_{\text{[–animate]}}$ **'with Pro'**	**LEX**	**FAITH**$_{\text{GENDER}}$	***STRONG**	*NULL
avec LUI$_{\text{[+gender]}}$			*!	
☞ avec Ø$_{\text{[–gender]}}$				*

Tableau 5: Inanimate complements of with-competition prepositions in French (Gender faithfulness analysis).

avec Pro$_{\text{[+human, +gender]}}$ **'with Pro'**	**LEX**	**FAITH**$_{\text{GENDER}}$	***STRONG**	***NULL**
☞ avec LUI$_{\text{[+gender]}}$			*	
avec Ø$_{\text{[–gender]}}$		*!		*

Tableau 6: Human complements of with-competition prepositions in French (Gender faithfulness analysis).

Since in this analysis strong pronouns do not carry animacy features, animacy cannot be the reason why strong pronouns are not preferred (or commonly used) for inanimate antecedents. The use of the strong pronoun is instead blocked by a candidate that does not violate *STRONG, i.e., the economy principle striving for lighter pronominal forms. There is thus a striking difference between the two analyses with respect to the manifestation of competition. In the animacy faithfulness analysis, strong pronouns which are specified as [+human] are boosted to being used for inanimate antecedents if the null pronoun is not available (e.g., with prepositions like *vers* or *malgré*). In the gender faithfulness analysis, strong pronouns are blocked from being used for inanimate antecedents with prepositions like *avec* or *sans* because these prepositions allow for a better candidate in terms of economy. Hence, we are dealing with boosting in the animacy faithfulness analysis, and with blocking as the type of competition effect in the gender faithfulness analysis. Another noteworthy difference between the two analyses is *where* a competition effect manifests itself. In the animacy faithfulness analysis, competition manifests itself with prepositions which do not allow for null pronouns, while in the gender faithfulness analysis it is with prepositions which do allow for null pronouns.

To complete the picture, let us briefly consider within the gender faithfulness analysis those prepositions which do not allow for null pronouns (**Tableaux 7** and **8**). For inanimate antecedents, LEX favors strong pronouns. For human antecedents, both LEX and FAITH$_{\text{GENDER}}$ favor strong pronouns (although these two constraints remain unranked with respect to each other at this point).

vers Pro$_{\text{[–animate]}}$ **'towards Pro'**	**LEX**	**FAITH**$_{\text{GENDER}}$	***STRONG**	***NULL**
☞ vers LUI$_{\text{[+gender]}}$			*	
vers Ø$_{\text{[–gender]}}$	*!			*

Tableau 7: Inanimate complements of without-competition prepositions in French (Gender faithfulness analysis).

vers Pro$_{\text{[+human, +gender]}}$ **'towards Pro'**	**LEX**	**FAITH**$_{\text{GENDER}}$	***STRONG**	***NULL**
☞ vers LUI$_{\text{[+gender]}}$			*	
vers Ø$_{\text{[–gender]}}$	*!	*!		*

Tableau 8: Human complements of without-competition prepositions in French (Gender faithfulness analysis).

The ranking so far under the gender faithfulness analysis is the following: {LEX, FAITH$_{\text{GENDER}}$} ≫ {*NULL, *STRONG}.

After considering the two analyses in light of the French data, we can attempt a first evaluation. Since both analyses capture the preferences observed in the experimental data, the evaluation must rely on conceptual considerations. In this respect the animacy faithfulness analysis might at first sight seem more appealing, since the empirical observation we need to account for are animacy and not gender restrictions in the use of strong and null pronouns. There are, however, several advantages of the gender faithfulness analysis which in our view weigh heavier. First, the gender faithfulness analysis derives the same pattern with fewer specifications (as animacy features on pronouns are no longer necessary). Second, it builds on gender features that are needed independently (e.g., for agreement), and whose presence/absence on the pronouns is undisputable, because they are morphologically realized (unlike the animacy features on pronouns). Third, it is compatible with more general assumptions about the feature specification of pronouns. After all, one questionable assumption of the animacy faithfulness analysis is that the null pronoun presents as many feature specifications as the strong one, whereas it is often assumed that null pronouns are less specified forms (Cardinaletti & Starke 1999; Alonso-Ovalle & D'Introno 2001; Bresnan 2001a; Siewierska & Bakker 2006).

Another interesting outcome of the gender faithfulness analysis is that null pronouns for humans but not strong pronouns for inanimates violate the faithfulness constraint (FAITH$_{\text{GENDER}}$). In the animacy faithfulness analysis, however, both null pronouns for humans and strong pronouns for inanimates violate the faithfulness constraint (FAITH$_{\text{ANIMACY}}$). The asymmetry predicted under the gender faithfulness analysis is reflected in our gradient acceptability data: inanimate strong pronouns are more acceptable than human null pronouns (**Figure 1** in Section 3.2).[13] Given that the analysis so far is sketched in a classical OT framework, which does not allow for gradient phenomena such as acceptability differences, we cannot directly account for this result. One of the motivations for applying a Stochastic Optimality Theory analysis in Section 4.2 is to overcome precisely this limitation.

Before that, we briefly turn to the Spanish data. The only preference to account for in a classical OT is that strong pronouns are preferred over null pronouns independently of the preposition type (competition or no competition) and the referent's animacy (human or inanimate, see **Table 2** preferences). This can be achieved just by the ranking of the structural constraints: *NULL ≫ *STRONG.

Although the classical OT framework helps us to capture the general preferences observed in our data it has its limits in accounting for the gradient acceptability data from our experiments and for some of the crucial findings. In the case of Spanish, this becomes most obvious with the prepositions which do allow for null pronouns (*delante* and *detrás* in our experiment). We observed that null pronouns are more acceptable with such prepositions than with *con* and *sin*, but strong pronouns are nevertheless the preferred option. This difference with respect to the status of null pronouns is not captured in the ranking *NULL ≫ *STRONG; and it could not be captured even if we were to include more constraints (LEX and faithfulness constraints) in a classical OT. Further, we observed that the availability of null pronouns has an impact on the acceptability difference between strong pronouns for humans and for inanimates. Recall that the difference in acceptability between strong pronouns for humans and for inanimates is bigger with *delante* and *detrás* than with *con* and *sin*, which suggests a competition effect also in Spanish: the increased acceptability of null pronouns has an impact on the acceptability of strong pronouns for inanimate antecedents, even if null pronouns are not the preferred option. We consider such cases of 'blocking from below' as special instances of blocking.

To align our analyses with the gradient data, and to further evaluate the animacy and the gender faithfulness analysis, we turn in Section 4.2 from classical OT to Stochastic OT. Applying all the constraints discussed so far to our gradient acceptability data will allow us to evaluate the

[13] Note however that Zribi-Hertz (1984: 17) considers that null pronouns used for human antecedents "is more common" than strong pronouns used for inanimate antecedents. This contradicts our results but also those from Heidinger (2024), which show no acceptability difference between these two cases.

rankings of also those constraints which remained unranked in the classical OT analysis and to verify how well the two analyses capture the empirical data respectively.

4.2 Evaluating the two analyses in Stochastic Optimality Theory

Stochastic Optimality Theory (SOT) is an OT-based framework meant to allow for both categorical and gradient grammaticality contrasts (Boersma 1999; Hayes 2000; Boersma & Hayes 2001). Its major differences compared to classical OT are the following:

– SOT adopts a continuous scale to represent the constraint ranking (*Con*), instead of the discrete scale adopted in classical OT. Constraints in SOT are thus associated with a numerical weight to locate them along the continuous scale.
– During the evaluation of candidates *(Eval),* a random noise is added to the constraint's weight in order to trigger local reversals, and then variable outputs. In SOT, constraints are thus not mere points on a scale, but they can be viewed as interval ranges. At each evaluation, the constraints randomly move along their range.[14]

SOT comes with a learning algorithm, called the Gradual Learning Algorithm (GLA), which takes as input a set of constraints and a frequency distribution, and outputs a constraint ranking with weights adjusted to this frequency distribution.[15]

We use the GLA to analyze our experimental data and produce constraint rankings for French and Spanish under the two analytical options introduced in Section 4.1: animacy faithfulness (25a) and gender faithfulness (25b).

(25) a. Animacy faithfulness: LEX, $\text{FAITH}_{\text{ANIMACY}}$, *STRONG, *NULL
b. Gender faithfulness: LEX, $\text{FAITH}_{\text{GENDER}}$, *STRONG, * NULL

The GLA requires a frequency distribution as input. Since our data consist of acceptability judgements only, we apply a pre-processing step to transform the acceptability differences between strong and null pronouns into estimated frequencies (see Boersma & Hayes 2001: 82 for details). We then use these frequency distributions together with the set of constraints defined in (25) to derive rankings for French and Spanish.

The resulting constraint rankings are shown in **Figure 3**, with the left panel corresponding to the animacy faithfulness analysis and the right to the gender faithfulness analysis.

[14] The added random noise follows a normal distribution with a mean corresponding to the constraint's weight and a standard deviation of 2 for all constraints.
[15] We leave out the details of this algorithm here and we refer to Boersma (1999) and Boersma & Hayes (2001) for a more precise description.

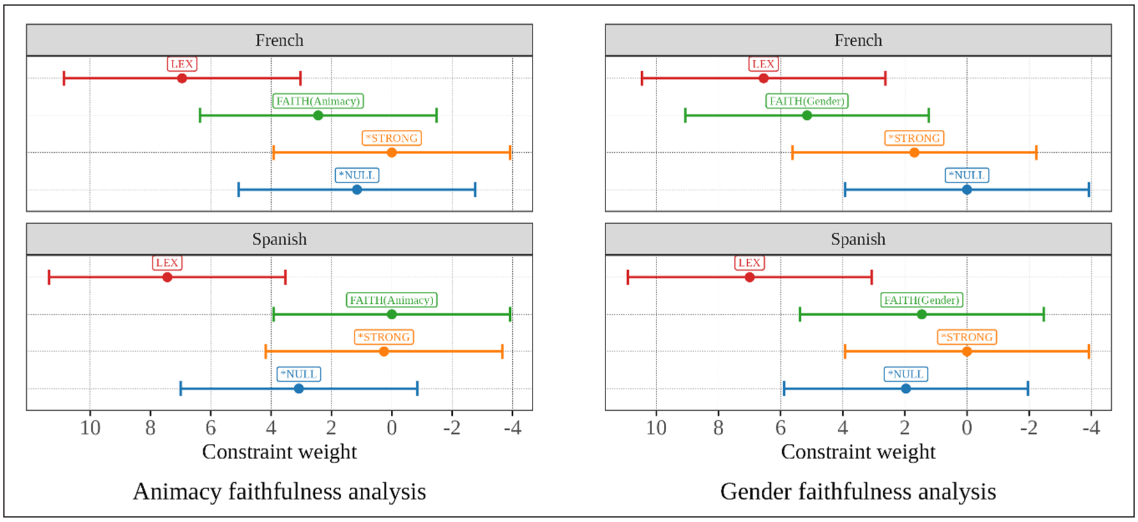

Figure 3: Constraint rankings produced by the GLA in French and Spanish.

To evaluate the respective analyses and check whether they correctly accounted for the observed data, we use the GLA to produce frequency distributions given the different constraint rankings. We then turn back these frequencies into predicted acceptability judgment differences and we compare them against the actual ones. We measure the accuracy of the predictions with the R^2 statistics, which estimates the linear fit between the actual and predicted acceptability judgment differences. The results are given in **Table 3**.

	Observed	**Predicted**	
		Animacy Faithfulness	**Gender Faithfulness**
French			
avec/sans *Pro*$_{[-\text{animate}]}$	–0.65	–0.59	–0.60
avec/sans *Pro*$_{[+\text{human}]}$	1.44	1.22	1.33
malgré/vers *Pro*$_{[-\text{animate}]}$	2.16	1.74	1.95
malgré/vers *Pro*$_{[+\text{human}]}$	2.16	3.34	2.47
R^2		**0.81**	**0.97**
Spanish			
delante/detrás *Pro*$_{[-\text{animate}]}$	0.72	0.72	0.71
delante/detrás *Pro*$_{[+\text{human}]}$	1.13	1.16	1.16
con/sin *Pro*$_{[-\text{animate}]}$	2.86	3.14	3.25
con/sin *Pro*$_{[+\text{human}]}$	2.86	3.43	3.29
R^2		**0.99**	**0.99**

Table 3: R^2 statistics for the fit between observed and predicted acceptability judgment differences (Acceptability$_{\text{STRONG}}$ – Acceptability$_{\text{NULL}}$).

Both analyses yield correct accuracy scores for Spanish ($R^2 = 0.99$). However, for French, the gender faithfulness analysis better accounts for the data ($R^2 = 0.97$) than the animacy-based one ($R^2 = 0.81$). While the animacy faithfulness analysis yields overall less accurate acceptability differences, its biggest error concerns the '*malgré/vers Pro*$_{[+\text{human}]}$' input, where it predicts that the strong pronoun has 3.34 acceptability points more than the null pronoun, contra 2.47 predicted by the gender faithfulness analysis, and 2.16 in the observed experimental data.

To understand this error, we need to have a look at the rankings in **Figure 3**. The crucial difference between the two analyses lies in the local ranking between *STRONG and *NULL, as shown in (26).

(26) Constraint ranking in French
  a. Animacy Faithfulness: LEX ≫ FAITH$_{\text{ANIMACY}}$ ≫ *NULL ≫ *STRONG
  b. Gender Faithfulness: LEX ≫ FAITH$_{\text{GENDER}}$ ≫ *STRONG ≫ *NULL

In the animacy faithfulness analysis, FAITH$_{\text{ANIMACY}}$ favors human strong pronouns and inanimate null pronouns. As *NULL is ranked higher than *STRONG, it interacts more often with FAITH$_{\text{ANIMACY}}$. This correctly predicts an asymmetry for unfaithful outputs in competition contexts: null human pronouns are less acceptable than inanimate strong pronouns. However, this same ranking leads to incorrect predictions when it comes to without-competition contexts. Indeed, *STRONG is now ranked too low to compensate the effect of the strong-favoring constraints (LEX, *NULL and FAITH$_{\text{ANIMACY}}$ with human antecedents), making human strong pronouns more acceptable than inanimate strong pronouns, contrary to the fact. The animacy faithfulness analysis thus faces a paradox: *NULL has to be ranked higher than *STRONG to penalize human null pronouns in competition-contexts, but *STRONG also has to be ranked higher than *NULL to equate the acceptability of human and inanimate antecedents in without-competition contexts.

The gender faithfulness analysis does not suffer this issue, because its faithfulness constraint FAITH$_{\text{GENDER}}$ already embodies the asymmetry between inanimate and human antecedents: it penalizes only human null pronouns. Thus, *NULL can be ranked lower than *STRONG, so the latter can now compensate for the constraints favoring strong pronouns in without-competition contexts. This leads to the similar acceptability rates for human and inanimate strong pronouns in without-competition contexts observed in the experimental data.

In Section 4.1., we have already suggested that the gender faithfulness analysis is conceptually superior to the animacy faithfulness analysis. The SOT analysis provides further support in that the gender faithfulness analysis is also empirically more accurate for French. We assume that gender faithfulness holds in both French and Spanish, even if the animacy faithfulness analysis performs equally well in Spanish. This makes sense within OT, since all languages obey the same constraints but differ in terms of their ranking. Additionally, applying the same analysis highlights interesting differences between the two languages in terms of constraint ranking, as shown in (27).

(27) Constraint ranking under Gender Faithfulness

a. French: LEX ≫ $\text{FAITH}_{\text{GENDER}}$ ≫ *STRONG ≫ *NULL

b. Spanish: LEX ≫ *NULL ≫ $\text{FAITH}_{\text{GENDER}}$ ≫ *STRONG

The main difference between the two languages lies in the relative ranking of the structural constraints *STRONG and *NULL. In French, *STRONG is ranked higher than *NULL. Strong pronouns can thus be considered more marked structures than null pronouns in French PPs: when no other constraint is violated (LEX and $\text{FAITH}_{\text{GENDER}}$), null pronouns tend to be used. However, the faithfulness constraint $\text{FAITH}_{\text{GENDER}}$ is ranked higher than the structural constraint *STRONG. This means that there is a stronger preference for marked and faithful outputs (i.e., strong pronouns) than for unmarked and unfaithful outputs (i.e., null pronouns). By contrast, in Spanish, *NULL is ranked higher than *STRONG, which makes null pronouns an overall more marked structure. All other things being equal, Spanish avoids null pronouns in PPs more than French. Given the well-known differences between French and Spanish with respect to the licensing of null subjects, the results from our study show that different syntactic contexts exhibit quite different restrictions as regards the choice of overt vs. null pronominal elements.

In our evaluation of the animacy-based approach, we focus on the analysis where both pronouns are specified for animacy since this corresponds to Zribi-Hertz's (1984a; 1984b) original proposal. In addition, we have determined the R^2 score for two animacy-based alternatives: (i) the strong pronoun is specified as [+human] and the null pronoun is not specified for animacy, (ii) the null pronoun is specified as [–animate] and the strong pronoun is not specified for animacy. The scores for (i) are 0.97 (French) and 0.99 (Spanish), and the scores for (ii) are 0.64 (French) and 0.98 (Spanish). While analysis (ii) has to be discarded based on the low R^2 score for French and general conceptual disadvantages (it requires the stipulation of animacy features; the null pronoun carries more features than the strong pronoun), analysis (i) deserves more attention. After all, it captures the empirical results equally good as the gender-based analysis in terms of the R^2 score. However, it suffers from the conceptual disadvantage of requiring the stipulation of animacy features. Since this is not the case in the gender-based analysis as gender features are needed independently (e.g., for agreement), we favor the gender-based analysis over the animacy-based analysis where only the strong pronoun is specified for animacy. Although our decision between these two analyses ultimately relies on conceptual arguments, the determination of the R^2 score is nevertheless crucial. It is only after the evaluation of the analyses' empirical power, and the outcome that they capture the data equally well, that conceptual arguments become decisive.

5 General discussion: Animacy restrictions and competition effects

After presenting the empirical results of the experimental studies (Section 3) and our constraint-based analysis (Section 4), we are now in the position to describe the link between animacy restrictions and competition effects, and address the issue of animacy features on pronouns. To do this we will come back to the research questions laid out in Section 1. Where possible, we will additionally compare our findings and analysis to the existing literature.

– RQ1: Does the presence or absence of competition have an effect on the animacy restrictions of strong pronouns?

Our experimental data show that the presence or absence of a weak competitor – or more specifically, the acceptability of the null pronoun – does have an impact on the animacy restrictions of strong pronouns. The gap in acceptability between the use of strong pronouns for humans and for inanimates depends on the acceptability of the null pronoun. The less acceptable the null pronoun is, the smaller the acceptability gap between strong pronouns for humans and for inanimates is. In the case of prepositions which do not allow for null pronouns (in our experiments: *malgré* 'despite', *vers* 'towards'; *con* 'with', *sin* 'without'), there is no difference in acceptability between strong pronouns for humans and for inanimates (by contrast, there is a difference in acceptability between strong pronouns for humans and for inanimates with prepositions where the null pronoun is acceptable). This empirically corroborates the claim by Zribi-Hertz (2000) that animacy restrictions on strong pronouns are sensitive to competition effects. The use of gradient acceptability data also allowed us to present a more fine-grained description of the competition effect, as we showed that the strength of animacy restrictions correlates with the acceptability of the null pronoun. The data align with previous studies which also showed the variable nature of animacy restrictions on strong pronouns, in French (Danell 1973; Poplack et al. 2012; Shimanskaya 2018; Heidinger 2019) as well as in Spanish (Jensen 1973; Fernández Soriano 1999; Alonso-Ovalle & D'Introno 2001; Pomino 2017). However, our data contradict the claim that strong pronouns are rigidly restricted to [+human] antecedents (Sandfeld 1965: 75; Cardinaletti & Starke 1999: 45; Cardinaletti 2024: 210).

– RQ2: Does the presence or absence of competition have the same effect across languages?

Although we observed the above-mentioned competition effect in both French and Spanish, the languages nevertheless show important differences, which concern the prepositions allowing for null pronouns (*avec* 'with', *sans* 'without'; *delante* 'in front', *detrás* 'behind'). With such prepositions in French, the strong pronoun is the preferred option for human antecedents and the null pronoun for inanimate antecedents. For inanimate antecedents, the null pronoun is thus preferred over the strong pronoun. With such prepositions in Spanish, the strong pronoun is the preferred option for both human and inanimate antecedents. For inanimate antecedents, the null pronoun is not preferred over the strong pronoun, but it nevertheless has an impact on the acceptability of strong pronouns. Hence, we observed in our empirical domain ‘blocking from below’ as a special instance of blocking where a less acceptable competitor reduces the acceptability of a more acceptable form.

Interestingly, in the absence of a weak competitor, i.e., when the null pronoun is not available (*malgré, vers; con, sin*), the two languages behave the same way: Strong pronouns do not underlie animacy restrictions and are equally acceptable for humans and for inanimates. Such absence of animacy restrictions on strong pronouns in without-competition PPs had already been suggested for both French (Zribi-Hertz 2000) and Spanish (Fernández Soriano 1999; Alonso-Ovalle & D’Introno 2001; Pomino 2017), we additionally show that the two languages also exhibit the same type of animacy restriction in with-competition PPs. For Spanish, this has not been mentioned in the literature about spatial prepositions, which we used for the with-competition context in our experiments (Zribi-Hertz 1984a; Pavón 2003; Fábregas 2007).

Extending the empirical coverage to other (Romance) languages is, of course, desirable and might further increase our understanding of animacy-related competition effects. Italian would be an obvious candidate for this since it probably takes an intermediate position between French and Spanish with respect to the threshold for prepositions allowing and disallowing null pronouns as complements (*senza* ‘without’ does, while *con* ‘with’ does not allow for null pronouns). Additionally, our informants for Italian disprefer strong pronouns for inanimates even in contexts without weak competitors.

– RQ3: What do competition effects tell us about the feature content of pronouns (in terms of animacy)?

The observed competition effects call into question the idea that strong and null pronouns are specified for animacy, and especially that strong pronouns are specified as [+human]. After all, we observed that in the absence of a null competitor strong pronouns can be used rather freely for human and inanimate antecedents. This was also Zribi-Hertz’s (2000) main argument for postulating that French strong pronouns do not carry animacy features. One could, however, also assume operations which manipulate the animacy features of pronouns and thereby allow strong pronouns (which are specified as [+human]) to be used for inanimates. The analysis of empirical data involving competition effects, i.e., data including both prepositions which allow and prepositions which disallow for null pronouns, allowed us to evaluate such an animacy-based faithfulness and, additionally, to compare it to an alternative analysis in which pronouns are not specified for animacy.

Both on conceptual grounds and in terms of accounting for the observed gradient acceptability data, the gender faithfulness analysis has proven preferable to the animacy faithfulness analysis.

This also relativizes the role of animacy features in the observed animacy restrictions.[16] The only relevance of animacy in the favored gender faithfulness analysis lies in the privileged relation between the semantic gender features of human antecedents (male, female) and the grammatical gender features of strong pronouns (masculine, feminine). No animacy features are assumed for strong or null pronouns. Leonetti (2022) uses the notion of competition more generally to explain paradigmatic oppositions and focuses on the comparison between code-based approaches (where oppositive features are encoded on the respective lexical items) and inference-based approaches (where the properties of a pair of alternatives emerge from an inferential reasoning). Although our focus is slightly different (since we care more about the presence vs. absence of alternatives), we reached the same conclusion that some paradigmatic oppositions are better accounted for without encoding the semantic differences via features on the respective lexical items (contra a code-based analysis). In our case, animacy restrictions on pronouns may arise without animacy features on the respective forms. In Leonetti's (2022) case, differences in topicality between pronouns do not follow from different topicality features on these forms.

– RQ4: What type of competition is at play? Blocking or boosting?

In Section 1 we saw that competition is a multifaceted phenomenon that manifests itself in at least two different ways: as blocking or as boosting. The term *blocking* is reserved for cases where the availability of an expression E_1 blocks an expression E_2, while in the case of *boosting* the unavailability of an expression E_2 boosts an expression E_1. Besides new insights into the animacy features (or lack thereof) on pronouns, our analysis in Section 4 also sheds light on which of these two types of competition effect actually holds in the present case. Crucially, two analyses predict different types of competition effects.

Under the animacy faithfulness analysis, the competition effect would be boosting, since the strong pronoun, which is specified for [+human], is used outside its common animacy domain, whenever the weak competitor, which is specified as [–animate] is unavailable. The functional range of strong pronouns is thus boosted when the null is not available. Under the gender faithfulness analysis, it would be wrong to assume boosting: the functional range of strong pronouns cannot be extended from [+human] to [–animate] because strong pronouns are not specified as [+human] in the first place (as neither strong nor null pronouns carry animacy features). What needs to be captured for French is why, for prepositions which allow for null pronouns, human antecedents are more acceptable with strong than with null pronouns and why inanimate antecedents are more acceptable with null than with strong pronouns. Both

[16] The analysis developed in this article for the prepositional domain might be extended to animacy restrictions on pronouns in other syntactic contexts. For example, it would be interesting to evaluate whether the preference for [+human] interpretations of arbitrary null subjects in Spanish can also be accounted for without assuming animacy features on these null pronouns.

empirical observations can be interpreted as blocking in the sense that there is a more optimal candidate available. Strong pronouns are blocked from being used for inanimate antecedents with prepositions like *avec* or *sans* because these prepositions allow for a more optimal candidate in terms of economy. Null pronouns are blocked from being used for human antecedents even with prepositions like *avec* or *sans* because the strong pronoun is a better candidate in terms of gender faithfulness.

6 Conclusions

The starting point of this study was the frequently reported observation that strong and null pronouns as complements of PPs in French and in Spanish differ in animacy. Especially for French, a vast body of literature provides data showing that strong pronouns tend to have human antecedents and that null pronouns tend to have inanimate ones. In Spanish, the literature claims that strong pronouns exhibit animacy restrictions in subject position but not as complements in PPs. This raises the question of whether animacy features are part of the pronouns' feature content (with strong and null pronouns carrying different animacy features). To address this question, we collected experimental gradient acceptability data from French and Spanish and analyzed them.

The experiments were designed such that not only pronoun types and animacy types were crossed, but that also the impact which the availability of a null pronoun (as a competitor to the strong pronoun) has on the animacy restrictions of the strong pronoun could be tested. The experiments show that the (un)availability of a null competitor does have an impact on the animacy restrictions of strong pronouns: When a null pronoun is available, we observed an animacy restriction on the strong pronoun (human > inanimate). In the absence of a null competitor, strong pronouns are unrestricted in terms of animacy and can have either human or inanimate antecedents.

To answer the question whether animacy features are part of the feature content of pronouns, we evaluated two potential analyses (which crucially differ with respect to the role of animacy features) in the face of the empirical data. Both on conceptual grounds and in terms of accounting for the observed gradient acceptability data, the gender faithfulness analysis has proven superior to the animacy faithfulness analysis. This clearly relativizes the role of animacy features in the observed animacy restrictions. In the favored gender faithfulness analysis, the only relevance of animacy lies in the privileged relation between the semantic gender features of human antecedents (male, female) and the grammatical gender features of strong pronouns (masculine, feminine). No animacy features are assumed as being part of the feature content of strong or null pronouns.

Since the two analyses also make different predictions with respect to the type of competition, our evaluation of the gender- and the animacy-based analysis allowed us to determine the exact nature of the competition effect. Under the animacy faithfulness analysis, the competition effect would be boosting (the [+human] strong pronoun is used outside its common animacy domain when used for inanimate antecedents). Under the gender faithfulness analysis, the competition effect would be blocking. Indeed, at least for French, one must assume that strong pronouns are blocked from being used for inanimate antecedents with prepositions like *avec* or *sans* because these prepositions allow for a more optimal candidate in terms of economy (the null pronoun), and null pronouns are blocked from being used for human antecedents with prepositions like *avec* or *sans* because the strong pronoun is a better candidate in terms of gender faithfulness. Our article highlights the role of competition in acceptability patterns and shows the need for taking alternative forms into account when interpreting apparent (animacy) feature mismatches.

Abbreviations

1	1st person
3	3rd person
CL	Clitic pronoun
DAT	Dative
F	Feminine
GEN	Genitive
M	Masculine
NONREFL	Non-reflexive
NULL	Null pronoun
PART	Partitive article
PL	Plural
REFL	Reflexive
SG	Singular
STRG	Strong pronoun

Supplementary files

The appendix to this article and the data and scripts used in the analysis can be found on the following OSF repository: https://osf.io/yufbv/.

Ethics and consent

The experimental studies presented in the article are approved by the Ethics Committee of the University of Graz (decision 39/217/63 ex 2023/24 on September 24th, 2024).

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Competing interests

The authors have no competing interests to declare.

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