

# Contrastive Pronouns in Null Subject Romance Languages

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## Abstract

Overt subject pronouns in Romance null subject languages are mandatory in order to express contrast, while null subject pronouns are generally prohibited in these contexts. However, most of the literature remains vague of what is meant by contrast. This paper argues that non-focal Romance contrastive pronouns are Contrastive Topics, which trigger topic alternatives and it is implicated that the truth of the alternatives is not known to the speaker (Hara and van Rooij (2007)). This implicature gives rise to an ‘uncertainty contrast’, which can be strengthened into an ‘exhaustive contrast’, in certain circumstances. The pairing between forms and meanings is derived using the mathematical framework of game theory.

*Key words:* Contrast, pronouns, Contrastive Topics, Romance languages, null-subject languages, game theory

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## 1. Introduction

Overt subject pronouns (OSPs, henceforth) in Romance null subject languages become obligatory when they convey contrast, while null subject pronouns (NSPs, henceforth) are generally prohibited in these contexts. This is widely acknowledged in the literature about subject expression in Romance. However, often no definition is offered of what is meant by contrast. Moreover, naturally-occurring instances of contrastive OSPs seemingly convey different types of contrast and it is not obvious whether they are amenable to a unitary analysis.

Although traditional grammars of Catalan and Spanish all recognize the role of contrast in triggering the appearance of OSPs, they remain vague

about their contrastive import. For instance, Alarcos Llorach (1994) states that overt pronouns “tienen marcado carácter enfático y expresivo y tratan de contraponer la persona aludida a las otras” (“have a marked emphatic and expressive character and [they] contrast the alluded person to the others”), without defining what exactly ‘contrast’ means or who the referent of the pronouns is contrasted with. Similarly vague claims are found in Catalan grammars: “Subject pronouns may be left unexpressed. In fact, they are usually left unexpressed, except for emphasis or contrast.” (Hualde, 1992) or “Catalan is characterized, like Spanish, Italian, and Portuguese, but unlike French, by the way in which subject pronouns accompany verbs only for particular emphasis.” (Wheeler, 1988).

This paper aims to offer a precise analysis of the contrastive import of Romance contrastive OSPs. I claim that non-focal contrastive OSPs are Contrastive Topic markers and I offer a definition based on a previous analysis by Hara and van Rooij (2007). The basic meaning of a Contrastive Topic is an uncertainty contrast, which can be strengthened into an exhaustive contrast in some particular discourse conditions. The pairing between forms and meanings will be analyzed using game theory, which is a mathematical framework to deal with decisions and rational strategy.

Note that I do not claim that all OSPs in Romance are contrastive. Overt pronouns in Romance appear for a variety of reasons related to information and discourse structure, contrast being one of them. One of the more important constraints regulating the variation between null and overt pronouns is subject (dis)continuity: while null pronouns tend to favor subject continuity (they tend to refer to the antecedent of the previous subjects), overt pronouns tend to favor subject discontinuity (see Carminati (2002) and Mayol and Clark (2010) for psycholinguistic evidence for Italian and Catalan, respectively, and Cameron (1992) for sociolinguistic evidence for Spanish). These tendencies, however, can be overridden if there are enough contextual cues; thus it is possible for NSPs to refer to antecedents in non-subject position (Mayol and Clark, 2010).

This paper is structured as follows. Section 2 reviews the main factors identified as regulating the variation between NSPs and OSPs and some consequences of the choice of a particular form. Section 3 presents the data of contrastive Romance pronouns by examining corpus examples. Section 4 reviews different approaches to the notion of contrast. Section 5 presents an analysis of the corpus data in which the pronouns are analyzed as Contrastive Topics markers. The pairing between forms and meanings is derived by means

of game theory in section 6. Finally, section 7 concludes.

## 2. Null and overt pronouns in null-subject languages

The absence and presence of subject pronouns in null-subject Romance languages has received significant attention from different perspectives. Syntactically, it has been extensively studied in generative grammar since the 80s. The possibility of having null subject pronouns has been attributed to the positive setting of a Null Subject Parameter, which also was responsible for other syntactic properties: subject inversion, rightward agreement in copular constructions, long *wh*-movement of subject and absence of *that*-trace effects (see, among others, Rizzi (1982), Jaeggli and Safir (1989) and Picallo (1984)).

Moreover, it has also been noted that the variation between NSPs and OSPs is not random, but that several factors trigger the appearance of one form or the other and that this choice has other linguistic consequences. For instance, as a significant semantic consequence, Montalbetti (1984) noted that NSPs and OSPs have a different semantic behavior in their ability to act as bound variables, following the principle in 1.

- (1) Montalbetti's Overt Pronoun Constraint (OPC): Full pronouns cannot be interpreted as bound variables except for those syntactic environments where null pronouns are not allowed.

The OPC captures the contrast in 2a and 2b: while the null pronoun can be interpreted as a bound or as a free variable, the overt pronoun can only receive the former interpretation. However, in a context in which the null pronoun is not allowed<sup>1</sup>, this is not the case and the overt pronoun can also receive a bound variable interpretation: this is shown in 2c for overt pronouns inside a prepositional phrase and 2d for focused overt pronouns, a contrast noted by Luján (1985, 1986).

- (2) a. Nadie<sub>i</sub> sabe que *pro*<sub>i/j</sub> vendrá.  
'Nobody<sub>i</sub> knows that he<sub>i/j</sub> will come.'

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<sup>1</sup>Null pronouns are not allowed in a variety of contexts in null-subject languages: in coordinations, inside a prepositional phrase or when modified by an adjective. There are also language specific constraints: for instance, null pronouns cannot appear in sentences in subjunctive in Italian. I will not consider these cases further in the rest of the paper.

- b. Nadie<sub>i</sub> sabe que él<sub>\*i/j</sub> vendrá.  
‘Nobody<sub>i</sub> knows that he<sub>i/j</sub> will come.’
- c. Ningún compañero<sub>i</sub> puede decir que Maria se haya enamorado de él<sub>i/j</sub>. (Rigau, 1986)  
‘No classmate<sub>i</sub> can say that Mary is in love with him.’
- d. Ningún estudiante<sub>i</sub> piensa que (sólo) ÉL<sub>i/j</sub> pasó el examen.  
‘No student<sub>i</sub> believes that only he<sub>i</sub> passed the exam.’

Another semantic contrast between sentences with and without overt pronouns is that only the latter allow for a generic interpretation in sentences such as 3 (Fernández Soriano, 1999).

- (3) Ø / Ellos llaman.  
‘Ø / They are calling.’

These interesting contrasts will not be discussed further in the remainder of the paper. Since I cannot do justice to the vast literature on null and overt pronouns in Romance null-subject languages, I point the reader to the comprehensive reviews found in Fernández Soriano (1999) and Luján (1999) for Spanish and Todolí (2002) for Catalan.

The main factors which have been discussed in the literature as regulating the variation between null and overt pronouns are the following:

- Subject (dis)continuity: Carminati (2002) proposes that null and overt pronouns have different antecedent biases: null pronouns prefer to retrieve an antecedent in the (highest) Spec IP, whereas overt pronouns prefer an antecedent in a lower syntactic position. This hypothesis is in accordance with Ariel’s (2001) Accessibility Theory that more marked, informative forms tend to retrieve less salient antecedents, while unmarked, less informative forms tend to retrieve more salient antecedents. Other studies that consider subject (dis)continuity as an important factor in the appearance of OSPs are a number of variationist studies of several languages, including Cameron (1992) and Silva-Corvalán (1977) for Spanish.
- Focality: Vallduví (2002) notes that OSPs are mandatory in cases in which they represent focal information (in clefts, answers to wh-questions, comparative constructions, focus constructions, constructions with an elliptical verb, etc.). This naturally follows from the fact that focal information

either receives an emphatic stress or is placed at the end of the main clause, which is where the main pitch of the sentence is located. In the former case, obviously null pronouns cannot support this emphatic stress. In the latter case, focal information always receives the main pitch of the utterance. Since null pronouns cannot be stressed, an overt pronoun is required to express the focus and receive the main pitch. This can clearly be seen in 4: the subject pronoun, which represents focal information and is either postverbal or emphatically stressed, cannot be omitted, although the verb contains all the necessary agreement information to retrieve the antecedent of the pronoun. The main stress needs to fall on the focus and that's why the pronoun must be pronounced. The answer in 4b is not appropriate in this context because the predicate receives the main pitch and, thus, is marked as focus.

- (4) a. Qui et va veure?  
 Who saw you?  
 b. \* Em vas veure.  
 me past see  
 c. Em vas veure tu.  
 me saw you  
 d. TU em vas veure.  
 You me saw  
 'You saw me.'

Brucart (1987) has a similar insight and proposes the Principle of Lexicalization of Pronouns, which says that those pronouns which contribute new information to the discourse must have phonetic realization.

Focal pronouns can be contrastive or non-contrastive (Vallduví and Vilkuna, 1998; Neeleman et al., 2008). However, regardless of their contrastivity, focused constituents must be overt, must have phonological content. Thus, there is no variation between NSPs and OSPs when a pronoun conveys focal information. This is, of course, not true of non-focal pronouns. Non-focal pronouns will take different forms depending on their contrastive interpretation, among other things. In the remainder of the paper I basically concentrate on the behavior of non-focused pronouns, although focused pronouns will appear occasionally in the discussion.

- Contrast: As mentioned in the introduction, contrast is recognized in the literature as an important factor triggering the presence of OSPs. Section 3 reviews the data this paper is concerned with and section 4 presents several approaches to the semantic notion of contrast.

### 3. The data

This section presents corpus examples in which the subject pronoun may be taken to convey some notion of contrast. The corpus examples do not all follow the same structure, nor they convey the same contrastive meaning. Thus, there seem to be different types of examples and different notions of contrast at stake. Unless otherwise noted, all examples are taken from the Nocando (2004) corpus of narrations: Catalan, Spanish and Italian speakers were asked to narrate stories presented to them with illustrations only. There were three different stories and each story was told by several speakers in their native language. These narrations were recorded and transcribed.

Descriptively, the corpus examples can be broadly divided into three classes: those conveying a double contrast between two entities, those conveying an implicit contrast and those conveying what I call a weak contrast.

#### 3.1. Double contrast

I call “double contrast” the two-clause discourses in which two different referents occupy the subject position and their respective verb phrases predicate two different, and in some sense opposite, actions or states. Consider the two Catalan examples in 5. There are antonym predicates in each clause: *be happy* and *be sad* in 5a and *go (sailing)* and *stay* in 5b. The two opposite actions or states are predicated of two different referents in subject position.

- (5) a. En el camí de tornada tots estan enfadats i **ell**, en canvi, està content.  
 “On the way home, they are all angry and **he**, in contrast, is happy.”
- b. Ara **nosaltres** anirem a navegar per l’aigua i **tu** et quedaràs aquí sola.  
 “Now **we** will go sailing in the water and **you** will stay here on your own.”

This type of contrast is explicitly stated in the discourse (as opposed to the implicit contrast that I present in Section 3.2) and, for each of the relevant entities at the discourse, it is conveyed whether they did (or did not do) the action that is predicated of them (as opposed to the weak contrast that I present in Section 3.3).

The two sentences become infelicitous if the OSP is replaced by just an NSP. The infelicity of these sentences without the OSP is neither due to potential ambiguity nor to the fact that there is coordination. As for potential ambiguity, the verbal morphology unambiguously indicates the person of the verb, which is different in the two clauses of both sentences: third person plural and third person singular in 5a and first person plural and second person singular in 5b. As for coordination, NSPs in a coordination that does not convey contrast are acceptable, as shown in example 6a. In contrast, NSPs in a discourse without coordination but with contrast, are still infelicitous, as shown in example 6b, a modified version from 5a.

- (6) a. A mig camí la gran tira la granoteta avall i  $\emptyset_{smallfrog}$  es queda endarrerida i, a sobre,  $\emptyset_{smallfrog}$  es fa mal.  
 “On the way, the big frog pushes the small frog and  $\emptyset_{smallfrog}$  is left behind and, on top of that,  $\emptyset_{smallfrog}$  hurts itself.”
- b. En el camí de tornada tots estan enfadats amb el nen. # En canvi,  $\emptyset_{thechild}$  està content.  
 “On the way home, they are all angry with the child. # In contrast,  $\emptyset_{thechild}$  is happy.”

Similar examples are found for Spanish and Italian, as shown in 7.

- (7) a. La tortuga grande se queda a un lado del río, mientras **ellos** van a dar una vuelta con la barca.  
 “The big turtle stays at the side of the river, while **they** go around with the boat.”
- b. **Io** resto sulla barca e **tu** cadi in acqua.  
 “**I** stay on the boat and **you** fall into the water.”

This type of contrastive OSPs, in a double contrast, are usually excluded from the envelope of variation between NSPs and OSPs in sociolinguistic studies, since indeed there is no variation between the two forms. Cameron (1992), who investigated subject expression in Puerto Rican Spanish, is one

of these studies. In particular, he distinguished three subcases of double contrast to be excluded from the envelope of variation.

- Contrast of Negation: the same predicate (or two similar predicates) occurs in two sentences, but it is negated in the second one:

(8) **Ellos** fueron pero **yo** no fui.

They went but I did not go.

- Contrast of Scalar Opposition: there are two similar predicates, which are modified by adjuncts which are construable as elements of a scalar set, such that the two adjuncts differ by degree.

(9) Mi señora habla bien inglés pero **yo** lo hablo bastante mal.

My wife speaks English well but I speak it very brokenly.

- Contrast of Alternatives: this type occurs when object arguments of the first and second sentences are construable as elements of a set and understood as alternatives to one another.

(10) **Yo** fui a una escuela y **él** fue a otra.

I went to a school and he went to another one.

However, it is not the case that NSPs are always excluded in double contrast discourses. In fact, Matos Amaral and Schwenter (2005) argue against the idea that OSPs are obligatory in a situation of contrast and show that other linguistic material (such as adverbs) can enable the appearance of an NSP, as 11 shows for Spanish. The reply of Informant A in 11c is unacceptable if there is no contrast marker. It becomes felicitous when a contrast marker is present, be it an overt pronoun or the adverb *aquí* (literally *here*, translated by Matos and Schwenter, as ‘in our case’). According to them adverbials which can be constructed as referring to the referent of the subject of the sentence will be acceptable in situations that require a contrast marker.

- (11) a. Inf A: ¿Vosotros lo tenéis el lunes?  
‘You guys have it on Monday?’  
b. Inf B: El lunes. Un día estratégico, además.  
‘Monday. A day, a strategic day, besides.’

- c. Inf A: Bueno, (**nosotros** / **aquí**/ \*  $\emptyset$ ) lo tenemos el viernes.  
 ‘OK, (**we** / **here**/ \*  $\emptyset$ ) we have it on Friday.’

### 3.2. *Implicit contrast*

Implicit contrast discourses do not have the explicit contrastive structure we have just examined. However, they do convey an implicit contrast between the antecedent of the pronoun and another entity, highly salient in the context.

Consider example 12a for Catalan: two frogs are the main characters of this story. The big frog is the referent of the NSP of the clause before the OSP. Thus, this referent is maximally salient at the moment of utterance of the OSP. However, an OSP, which has a preference for non-subject referents (Carminati, 2002; Mayol and Clark, 2010), is used to refer to this maximally salient entity. By using this OSP, a contrast is conveyed between the antecedent of the pronoun and the other entity salient in the discourse (that is, the other frog): that is, it is conveyed that one frog, the referent of the pronoun, is big, while the other is not, although this second frog is not explicitly mentioned.

If the OSP were absent, the discourse would still be acceptable and the NSP would still refer to the same referent (to the previous subject, which is what NSPs tend to refer), but no contrast would be evoked.

The same thing happens with the second OSP of 12b, by which an implicit contrast between the boy and the rest of the family is established, and it is conveyed that the rest of the family, unlike the boy, was looking forward to the dinner.

- (12) a. El nen torna a renyar la granota gran i li torna a dir que això no pot ser, que han de ser amics, que s’han de comportar bé i que i  $\emptyset_{bigfrog}$  l’ha de cuidar perquè **ella**<sub>bigfrog</sub> és la gran.  
 “The child scolds the big frog again and tells it again that this can’t continue, that they should be friends, they should behave themselves and that  $\emptyset_{bigfrog}$  should take care of it because **she**<sub>bigfrog</sub> is the big one.
- b. En el camí de tornada tots estan enfadats i ell, en canvi, està content perquè **ell** no tenia cap ganes d’anar-se’n a sopar.  
 “On the way home, they are all angry and he, in contrast, is happy, because **he** was not looking forward going out for dinner.”

This type of contrast is also conveyed through OSPs in Spanish and Italian. The OSP in 13a refers to a highly salient referent and the discourse strongly conveys that while the small frog (the referent of the pronoun) wanted to be friends with the big one, the opposite was not true. The same implicit opposition is true in 13b, in which the speaker implicitly contrasts him having known Michelino for many years with the addressee, who has just met him.

- (13) a. La ranita se pone a llorar porque  $\emptyset$  se ha hecho daño y además **ella** quería que las dos fueran amigas.  
 “The little frog starts crying because she has hurt herself and, moreover, **she** wanted that they should be friends”.
- b. Guarda che **io** lo conosco da un sacco di anni, a Michelino.  
 “**I** have known Michelino for many, many years.”

### 3.3. *Weak contrast*

Finally, the third type of contrast is the weakest of all: it is conveyed that the speaker ignores or does not want to commit herself<sup>2</sup> to whether the predicate is true of anyone else than the antecedent of the OSP. That is, unlike double contrast and implicit contrast, it is not conveyed that there is an opposition between the antecedent of the OSP and some other entity in the discourse or in the context. Rather, the speaker is only making a claim about the referent of the OSP and leaves it open whether this claim should or should not apply to the other referents relevant in the discourse.

Consider example 14a: a waitress is asking a group of people what they would like for dinner. The mother answers with a sentence containing an OSP. Her answer does not convey an implicit contrast between her eating chicken and someone else eating something else, but it is just a partial answer to the waiter’s questions; the other people in the group may or may not eat chicken. The sentence without the OSP would be quite odd in this context since it would present the answer as if it was complete and exhaustive in a context in which obviously it is not.

- (14) a. ‘Què voldran per sopar?’ La mare diu: ‘Bé, doncs **jo** vull pollastre’ i el pare ‘Doncs, **jo** vull sopa’.

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<sup>2</sup>I adopt the convention of using the feminine pronoun to refer to the speaker and the masculine pronoun to refer to the hearer.

- “ ‘What will you have for dinner?’ The mother says: ‘Well, **I**’ll have chicken’ and the father says ‘Well, **I** will have soup’.”
- b. “Miri, senyora, **nosaltres** no sabem pas res de cap granota.”  
 “Look, mam, **we** don’t know anything about a frog.”

The context for 14b is the following: a frog has been creating trouble in a restaurant and one of the costumers complains to the waiters, which are quite clueless about what is going on with the frog. As before, there is no opposition between them not knowing about the frog and someone else knowing about it, but the sentence conveys a weaker meaning: as far as they are concerned, they don’t know anything about a frog; someone else may or may not know about it.

Weak contrast can also be expressed through OSPs in Spanish and Italian. In example 15a, taken from Stewart (2003), the informant of a sociolinguistic interview is explaining how she prepares for her job as a journalist. In the first part of the example, she uses the generic second person. However, when she wants to make it clear that this is just her personal experience and that other journalists may or may not do what she has just described, she switches to first person and uses an OSP. In 15b, the speaker makes explicit her own ignorance, leaving it open that other people may or may not know the answer to the question under discussion. These discourses also show that there does not need to be a particular set of entities in order to establish a weak contrast, but that it can remain unspecified<sup>3</sup>.

- (15) a. Entonces cuando por la mañana sabes que se convoca una manifestación de estudiantes o, vamos, una cosa similar, pues te informas un poco del tema. Vamos **yo** por lo menos pues miro si ha pasado en días anteriores.
- “So when one morning you know that a student demonstration is to be held, or, well something like that, well, you find out a bit about the issue. Well, at least **I**, well, look if it has happened on previous days.”
- b. “Ma, **io** non so niente.”  
 “But **I** don’t know anything about it.”

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<sup>3</sup>I thank an anonymous reviewer for pointing this out.

#### 4. Contrast as a semantic operator

This Section contains a review of the notion of contrast as a semantic operator. I offer a brief review of the literature on contrast concentrating on the analysis of contrastive topics, which will be used to analyze the contrastive import of non-focal Romance contrastive OSPs.

Vallduví and Vilkuna (1998) convincingly argue that it is necessary to distinguish between informational rhematicity and quantificational *kontrast*<sup>4</sup>, two notions that are often subsumed under the term *focus*. According to them, *kontrast* is a semantic operator which generates a set of alternatives which become available to the semantic computation as a quantificational domain of, for instance, focus-sensitive adverbs. If an expression *a* is *kontrastive*, a set *M* of alternatives is generated. These alternatives need to be comparable to *a*, in the sense of being similar but different (see Umbach (2004) for discussion). For instance, in 16a, the focused (or *kontrast*-marked) constituent ‘Sue’ generates a set of alternatives, whose elements need to be different from Sue but similar to her at the same time, for instance by containing other friends or colleagues of John. The unacceptability of 16b shows that the alternatives need to be different; that is, one cannot subsume the other (16b is only acceptable if *martini* is not a drink). In 16c, the need for the alternatives to be similar triggers the interpretation of *port* as a drink.

- (16) a. John only saw SUE at the dinner party.  
b. # John only paid for the DRINKS, not for the MARTINI.  
c. John only paid for the BEER, not to for the PORT.

Vallduví and Vilkuna (1998) explore several ways in which contrastiveness can operate in the set of alternatives. Particularly relevant for our purposes is the distinction between identificational, exhaustiveness and thematic *kontrast*, which they informally define as:

- Identificational *kontrast*: if  $M = \{a,b,c\}$  and  $P(x \in M)$ , then  $P(a)$ .
- Exhaustiveness *kontrast*: if  $M = \{a,b,c\}$  and  $P(x \in M)$ , then  $\neg(P((y \in M) \neq a))$ .
- Thematic *kontrast*: if  $M = \{a,b,c\}$  and  $P(a)$ , then  $P'((y \in M) \neq a)$ .

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<sup>4</sup>They spell *kontrast* like this to distinguish it from the general notion of contrast.

There is some controversy in the literature about whether focused constituents convey an identificational or exhaustiveness contrast. Rooth (1985) argues that in a sentence like 17a contrast is merely "identificational". The contrastive import of the focused phrase could be paraphrased as follows: if a proposition of the form "John saw x at the dinner party" is true, then "John saw Sue at the dinner party" is true. In contrast, operators like *only* give rise to exhaustiveness by negating all the alternatives created by the focused constituent (17b). Other authors argue that focused constituents do not trigger an identificational contrast, but an exhaustive one, even if no adverb such as *only* is present (see, for example Svoboda and Materna (1987)). Also, according to Kuno (1972), the Japanese morpheme *ga* triggers what he calls an exhaustive listing interpretation, which can be paraphrased as 'x and only x' or 'it is x that' and is equivalent to the exhaustiveness contrast just presented.

- (17) a. John saw SUE at the dinner party.  
 b. John only saw SUE at the dinner party.

Finally, the thematic contrast, the definition of which goes back to Ronat (1979), can be paraphrased as "if a property P holds of *a*, then other properties P' hold of other members of M". Vallduví and Vilkuna argue that this is the contrast conveyed by "contrastive topics" (see also Szabolcsi (1981)). This paraphrase captures the idea that a contrastive topic triggers alternatives and that it is left unspecified what is asserted of these alternatives. Subsequent analysis of Contrastive Topics have attempted to make their meaning more explicit. The main analyses will be reviewed in the next Section.

#### 4.1. Contrastive Topics

##### 4.1.1. Büring (1999, 2003)

Büring (2003; 1999) proposes an analysis for Contrastive Topics (CT, henceforth)<sup>5</sup>. In particular, Büring discusses CTs in English and German, which mark CTs with stress, namely with a rising pitch contour, L-H\*, unlike Focus, which receive a falling one, H-L\*. In example 18, the first constituent is the CT, while the last one is a Focus.

- (18) a. A: Which book would Fritz buy?

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<sup>5</sup>In his earlier papers, Büring refers to Contrastive Topics as S-Topics or Sentence Topics.

- b. B:  $[I]_{CT}$  would buy [ $\text{'The Hotel New HAMPshire'}\text{'}$ ]<sub>F</sub>.
- c. B': # I would buy [ $\text{'The Hotel New HAMPshire'}\text{'}$ ]<sub>F</sub>.

Büring's idea is that CTs introduce alternatives, in a similar way as Focus does. However, instead of introducing a set of propositions, such as Focus does (Rooth, 1992), a CT introduces a set of sets of propositions or, in other words, a set of questions. Consider again example 18. The focus value of answer B, repeated in 19a, is a set of propositions, such as the one in 19b, while its contrastive topic value (represented by  $[[B]]_{CT}$ ) is a set of such sets of propositions, such as in 19c or 19d.

- (19) a.  $[I]_{CT}$  would buy [ $\text{'The Hotel New HAMPshire'}\text{'}$ ]<sub>F</sub>.
- b. {I would buy 'War and Peace', I would buy 'The Hotel New Hampshire', I would buy 'The World According to Garp', ...}
- c. {{I would buy 'War and Peace', I would buy 'The Hotel New Hampshire', I would buy 'The World According to Garp', ...}, {Paul Simon would buy 'War and Peace', Paul Simon would buy 'The Hotel New Hampshire', Paul Simon would buy 'The World According to Garp', ...}, {Fritz would buy 'War and Peace', Fritz would buy 'The Hotel New Hampshire', Fritz would buy 'The World According to Garp', ...}}
- d. {Which book would I buy, which book would Paul Simon buy, which book would Fritz buy, ...}

In addition, Büring proposes the following Question/Answer Condition:

- (20) Question/Answer Condition: the meaning of the question Q must match one element in the Topic value ( $[[A]]_{CT}$ ) of the answer A.

This condition explains the felicity of a contrastive topic, as illustrated in answer B of 18: Since the answer introduces alternatives, including 'Which book would Fritz buy?', the meaning of the question matches this alternative.<sup>6</sup> In contrast, answer B' is not felicitous, since it lacks the topic marking and only the focal alternatives are introduced. The Question/Answer Condition also explains the felicity of a partial Topic, in which the answer addresses

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<sup>6</sup>Krifka (1999) points out that the Question/Answer Condition is a necessary, but not sufficient condition for the felicity of this type of answer. The answer only makes sense if we can assume that there is some relation between the original question and the answer.

part of the topic. The meaning of the question 21a matches one element in the Topic value of the answer, namely the one represented first in the set in 21d.

- (21) a. A: What did the popstars wear?  
 b. B: The [female]<sub>CT</sub> popstars wore [caftans]<sub>F</sub>.  
 c. B': # The female popstars wore [caftans]<sub>F</sub>.  
 d. {What did the male or female popstars wear, what did the female popstars wear, what did the male popstars wear, what did the Italian popstars wear}

Further, Büring assumes that CTs carry the following implicature:

- (22) Topic Implicature: Given a sentence A, containing a Contrastive Topic, there is an Element Q in  $[[A]]_{CT}$  such that Q is still under consideration after uttering A.

That is, there is a question in the set of questions denoted by  $[[A]]_{CT}$  which is still disputable, which he calls Residual Topic. The residual Topic might be 23a for 19a and 23b for 21. Note that in both cases the Residual Topic is an element of the Topic Value; in the second case, it is the original Topic, which has not been yet resolved.

- (23) a. What would Fritz buy?  
 b. What did the male pop stars wear?

This Topic Implicature accounts for the so-called purely implicational Topics, as illustrated in example 24. The answer without the topic marking would also be felicitous. However, the answer with the topic is still acceptable. According to Büring, this topic accent introduces alternatives, such as the ones in 25 and, by the Topic Implicature, at least one element in 25 is still under consideration and can serve as a Residual Topic. So, with this kind of utterance, the speaker B can indicate that there is at least one person whose wife might or might not have kissed other men.

- (24) a. A: Did your wife kiss other men?  
 b. B: [My]<sub>CT</sub> wife [didn't]<sub>F</sub> kiss other men.  
 c. B': My wife [didn't]<sub>F</sub> kiss other men.
- (25) {{my wife kissed other men, my wife didn't kiss other men}, {{your wife kissed other men, your wife didn't kiss other men}}, {{Fritz' wife kissed other men, Fritz' wife didn't kiss other men},...}}

#### 4.1.2. Hara and van Rooij (2007)

Hara and van Rooij (2007) claim that the Japanese morpheme *wa* is a contrastive topic and that it is licit when the speaker is not sure of the alternatives having the property denoted by the verb or when the speaker knows that the alternatives do not have the property, as the following example shows.

(26) a. Among John and Bill, who came to the party?

b. JOHN-wa kita.

John-wa came.

(John came, Bill didn't come or I don't know about Bill; the speakers considers the possibility that 'Bill came' is false.)

Hara and van Rooij (2007) point out a number of problems with Büring's proposal and propose a simpler way to obtain topic alternatives. The main problem with Büring's approach is that it predicts that Topic marking can only occur with partial answers and should not be able to occur when questions are completely resolved. This prediction is not born out, as answer 27b shows. That is, the CT marking on *Bill* implies that there is still an alternative under consideration. However, at that point, the question has been completely answered. A possible way out for Büring would be to limit the domain of the partial-answer requirement to each conjunct. However, then another problem would arise: answer 27c would be predicted to be felicitous.

(27) a. Among John and Bill, who came to the party?

b. [<sub>CT</sub> John] came, and [<sub>CT</sub> Bill] didn't come.

c. # [<sub>CT</sub> John] came, and [<sub>CT</sub> Bill] came.

Tomioka (2008) also notes that Japanese *wa* is licensed even without a focused constituent and this poses a problem for Büring's approach, which crucially relies on focused marked constituent to generate the alternatives

Hara and van Rooij (2007) propose that Topic marking creates a simple set of Topic-alternative propositions and give rise to the implicature that one of the Topic-alternatives is not known to be true by the speaker. Crucially, knowledge is defined as "a speaker has more knowledge about P if she knows of more individuals that they have property P" (Schulz and Van Rooij, 2006): thus, knowing that some individual does not have property P, is not counted as knowledge. Then, for the speaker not to know that one of the topic

alternatives is not true is compatible with both ignoring whether it is true or not, and knowing that it is false.

- (28) a. Topic alternatives:  $\{P(T'): T' \in \text{Alt}(T)\}$   
 b. CT-implicature:  $\exists T'[T' \in \text{Alt}(T)] [\neg \mathbf{K}_{sp}(P(T'))]$ , where  $\mathbf{K}_{sp}$  represents “the speaker knows that”.

This proposal derives the contrast in 27 in the following way. Consider first the acceptable answer in 27b. The first conjunct of this sentence generates the Topic alternatives in 29a and the implicature in 29b. The implicature is compatible with the second conjunct of the sentence, in fact, the second conjunct is just strengthening the implicature (29c). The second conjunct generates the set of Topic alternatives in 30a and the implicature in 30b. Again, the implicature is compatible with the assertion of the first conjunct (30c). Note that the implicature of the second conjunct is not informative, since it conveys something weaker than the previous assertion: however, this does not render the discourse infelicitous. Compatibility between implicatures and assertions is all that it is needed to make the discourse felicitous.

- (29) a. Topic alternatives:  $\{\text{John came, Bill came}\}$   
 b. CT-implicature (1st conjunct):  $\neg \mathbf{K}_{sp}$  (Bill came)  
 Possibly Bill did not come.  
 c.  $\neg \mathbf{K}_{sp}$  (Bill came)<sub>Implicature</sub> and  $\mathbf{K}_{sp} \neg$ (Bill came)<sub>Assertion</sub>
- (30) a. Topic alternatives:  $\{\text{John did not come, Bill did not come}\}$   
 b. CT-implicature (2nd conjunct):  $\neg \mathbf{K}_{sp}$  (John did not come)  
 Possibly John came.  
 c.  $\mathbf{K}_{sp}$  (John came)<sub>Assertion</sub> and  $\neg \mathbf{K}_{sp}$  (John did not come)<sub>Implicature</sub>

Consider now the unacceptable answer in 27c. The same topic alternatives are generated for both conjuncts, namely those in 29a. The CT of the first conjunct implicates  $\neg \mathbf{K}_{sp}$  (Bill came) and this is contradicted by the assertion of the second conjunct:  $\mathbf{K}_{sp}$  (Bill came). Note also that this means that this implicature should be treated as a Conventional Implicature (in the sense of Potts (2007)) since they cannot be canceled by a following assertion.<sup>7</sup>

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<sup>7</sup>Or rather a stronger cue is needed to cancel the implicature, such as the particle *too*. Krifka (1999) proposes an analysis for these particles, which basically provides a mechanism to get around what he calls the Distinctiveness Constraint, similar to the CT-implicature discussed here.

Tomioka (2008) argues that the interpretation Hara and van Rooij derive for 26b is too weak in a context in which it is common knowledge that the speaker has complete knowledge about who came to the party. In this case, the interpretation the hearer arrives at is not that the speaker considers that it is possible that Bill did not come, but that the speaker knows that Bill did not come.<sup>8</sup> In the next Section, I address this issue.

## 5. Analysis: contrastive pronouns as Contrastive Topics.

### 5.1. Previous proposals

The only proposal that makes explicit claims about the kind of contrast null-subject Romance OSPs conveys is that of Rigau (1989; 1986). Rigau noticed that OSPs can convey the weak contrast we examined in section 3.3 and, moreover, she noticed that there is a difference between non-emphatic and focused emphatic OSPs. Non-emphatic OSPs are compatible with the speaker claiming ignorance about some other entity, while emphatic OSPs are not, as shown in 31 for Catalan. That is, non-emphatic OSPs can convey a weak contrast, while emphatic OSPs cannot<sup>9</sup>.

- (31) a. Voleu venir tu i en Joan?  
           ‘Do you and John want to come?’

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<sup>8</sup>Tomioka also argues against Hara and van Rooij’s knowledge-based approach on the basis that *wa* does not appear only with assertions but with other speech acts. The alternative Tomioka proposes is that CTs trigger alternative Speech Acts and the usual Gricean reasoning applies: the speaker is left wondering why the alternative speech acts were not asserted. This is, however, too weak, since it predicts that sentence 26b should be compatible with a scenario in which Bill came to the party, it is common knowledge that the speaker has complete information and the speaker considers impolite to announce that Bill came to the party. However, this is not the case. I leave it for future work to expand the current proposal so that it can capture the use of Contrastive Topics in speech acts other than assertions.

<sup>9</sup>This is less clear when the question contains a presupposition, as in (i) below.

- (i) a. Així que tu i el Joan voleu venir?  
           So, you and John want to come, right?  
       b. ? JO vull venir, en Joan, no ho sé.  
           I want to come, John, I don’t know.

- b. Jo vull venir... en Joan, no ho sé.
- c. # JO vull venir.. en Joan, no ho sé.  
‘I want to come.. John, I don’t know’

Following Kuno (1972) and based on the contrast in 31, Rigau’s proposal is that a non-emphatic OSP triggers an exhaustive listing interpretation, while an emphatic one triggers a contrastive focus interpretation. Rigau (1989) assumes that the two readings are variants of the same emphatic operator. The exhaustive listing interpretation could be paraphrased as ‘Among the people under discussion, only A wants to come’. The contrastive focus interpretation conveys the negation of some alternative and can be paraphrased as ‘as for A (A = 1st person in 31), but not for X, A wants to come’.

While I agree with the judgments, the labels she uses for the non-emphatic OSP cannot be correct. The non-emphatic OSP does not convey an exhaustive listing interpretation. If it did, since “only A wants to come” conveys that the speaker knows that nobody else wants to come, sentence 31 should be a contradiction, but it is not.

### 5.2. *Current proposal*

The main proposal of this paper is that, in all the examples from section 3, the pronoun is a contrastive topic marker, in the sense of Hara and van Rooij (2007).

A Contrastive Topic triggers topic alternatives (32a) and conveys a CT-implicature, repeated in 32b: there is a topic alternative such that it is not known to be true by the speaker. I will call this implicature “uncertainty contrast” since it conveys that the speaker ignores whether the other alternatives are true or not. This CT-implicature can be strengthened under certain circumstances; namely, if there is a salient relevant alternative either implicit in the context or explicit in the discourse. This Strengthened CT-implicature conveys that the speaker knows that the salient topic alternative is false (32c). I will call this implicature “exhaustive contrast”.

- (32) a. Topic alternatives:  
 $\{P(T') : T' \in \text{Alt}(T)\}$
- b. CT-implicature (‘uncertainty contrast’):  
 $\exists T' [T' \in \text{Alt}(T)] [\neg \mathbf{K}_{sp}(P(T'))]$ , where  $\mathbf{K}_{sp}$  represents “the speaker knows that”.

- c. Strengthened CT-implicature (‘exhaustive contrast’):  
 $\exists T'[T' \in Alt(T)] [\mathbf{K}_{sp} \neg (P(T'))]$ , where  $\mathbf{K}_{sp}$  represents “the speaker knows that”.

That is, looking back at the data in 26, if the hearer knows the speaker has complete knowledge about who came to the party and uses sentence 26b, the CT-implicature will get strengthened and the stronger meaning of the Strengthened CT-implicature will be conveyed.

I also argue that the set of alternatives triggered by a Contrastive Topic is necessary to signal partial answers and that partial answers are not felicitous if there is no marker that indicates that other alternatives need to be considered. In this section, I apply this analysis to contrastive OSPs and I make more precise the pairing between forms and meanings. I concentrate in applying the analysis to the Catalan examples, but the same reasoning applies to Spanish and Italian.

Let us now go back to the data. The weak contrast examples will be examined first, since they are the ones that fit best with the unstrengthened meaning of Contrastive Topics. Consider first example 14a, repeated in 33a. By virtue of being a CT marker, the OSP introduces topic alternatives (33b) and the CT-implicature implies that the truth of the alternatives is not known to the speaker. The meaning that it is derived is that it is left open what other members of the family will eat. The answer is a partial answer to the question and the triggered alternatives make such a partial answer felicitous. An answer without the OSP would not introduce the alternatives and, thus, it would have to be understood as a complete answer in a context in which obviously it is not. Note also that, at the end of the dialogue, the question under discussion is completely resolved at the end of the utterance.

- (33) a. ‘Què voldran per sopar?’ La mare diu: ‘Bé, doncs **jo** vull pollastre’ i el pare ‘Doncs, **jo** vull sopa’.  
 “ ‘What will you have for dinner?’ The mother says: ‘Well, **I**’ll have chicken’ and the father says ‘Well, **I** will have soup’.”  
 b. {‘My husband will have soup’, ‘My son will have soup’}

Consider now example 14b, repeated below. This is what Büring would call a Purely Implicational Topic: the OSP is not necessary, because the topic-alternatives are not required in the context, but it serves to trigger the CT-implicature about the non-asserted propositions. That is, it serves to

convey an uncertainty contrast: as far as the speaker is concerned, someone else may (or may not) know about the frog. Moreover, unlike the example just discussed, the question is not completely resolved.

- (34) a. “Miri, senyora, **nosaltres** no sabem pas res de cap granota.<sup>10</sup>”  
 “Look, ma’am, **we** don’t know anything about any frog.”  
 b. {‘The kids don’t know anything about any frog’, ‘The cooks don’t know anything about any frog’}

Let us move now to the implicit contrast. The examples in 12, also repeated below, can be explained in a similar manner as well. The pronoun also introduces topic alternatives but, in these cases, the CT-implicature gets strengthened: it is not the case that the speaker does not know whether the topic alternatives are true, but she knows that they are false. The uncertainty contrast is coerced into an exhaustive contrast. The discourse leaves no feeling of uncertainty to the hearer because there is one salient topic alternative in the context which is obvious to the participants in the conversation that it is not true: for instance, in 35a, the hearer can easily see that one of the topic alternatives of the set in 35b, ‘the small frog is the big one’ is not true. Thus, the CT-implicature gets strengthened: the uncertainty contrast becomes an exhaustive contrast and it is implicated that the contextually salient topic-alternative is not true.

- (35) a. El nen torna a renyar la granota gran i li torna a dir que això no pot ser, que han de ser amics, que s’han de comportar bé i que l’ha de cuidar perquè **ella** és la gran.  
 “The child scolds the big frog again and tells it again that this can’t continue, that they should be friends, they should behave themselves and that [null *bigfrog*] should take care of it because **she** *bigfrog* is the big one.

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<sup>10</sup>An anonymous reviewer points out an interesting observation: sentence *ii* below, without the OSP but with a right-dislocation receives a very similar interpretation as sentence 34a. Relating the effect of non-canonical structures, such as right-dislocations, with the contrastive interpretations discussed here is beyond the scope of this paper and merits further investigation.

(*ii*) Miri, senyora, no en sabem pas res, de cap granota.

- b. {“**The small frog is the big one**’, ‘the big frog is the big one’}

The same reasoning holds for 12b, repeated below. It is clear in the story told by the speaker that the boy (referred to by the pronoun *he*) was not looking forward to the dinner, while the rest of the family was. With the use of the contrastive topic, it is implied that this salient topic alternative is not true: the CT-implicature is strengthened and a stronger, exhaustive contrast is conveyed. Note that again the use of the OSP is optional. An NSP would refer to the same antecedent but no implicature would be triggered.

- (36) a. En el camí de tornada tots estan enfadats i ell, en canvi, està content perquè **ell** no tenia cap ganes d’anar-se’n a sopar.  
 “On the way home, they are all angry and he, in contrast, is happy, because **he** was not looking forward going out for dinner.”  
 b. {“**The rest of the family was not looking forward going out for dinner**’, ‘the pets were not looking forward going out for dinner’}

Finally, consider the cases of double contrast from 5. In those cases, the OSP is mandatory and there is no uncertainty feeling overall in the discourse. I argue that this is just another case of the Strengthened CT-Implicature being conveyed, of an uncertainty contrast being coerced into an exhaustive contrast. The OSP is mandatory because the discourse cannot be interpreted without contrast, unlike in the previous example, in which there is as sensible non-contrastive interpretation along the contrastive one. That is, the CT is needed to signal that each conjunct is a partial answer and that other alternatives will be considered.

Consider the example in 5b, repeated below in 37b. That utterance is an answer to the implicit question under discussion in 37a. With a pronoun marking a CT in each conjunct, a set of alternatives are introduced for each conjunct (38a and 38b). Each conjunct strengthens the CT-implicature of the other conjunct: that is, it is explicitly asserted that the Topic alternative is false. Thus, the discourse does not leave an overall feeling of uncertainty. By virtue of the topic alternatives being explicit in the discourse, the CT-implicature can be strengthened.

- (37) a. What will we all do?  
 b. Ara **nosaltres** anirem a navegar per l’aigua i **tu** et quedaràs aquí sola.

“Now **we** will go to the boat to sail in the lake and **you** will stay here on your own.”

- (38) a. {‘You will sail in the lake’, ‘They will sail in the lake’}  
b. {‘We will stay here’, ‘They will stay here’}

In double contrast examples, OSPs, or other CT markers, are mandatory because the introduction of alternatives is crucial to derive a meaningful interpretation. Sentences with NSPs are understood as complete answers to the question under discussion, while OSPs are not due to the fact that they introduce alternatives and, thus, they can introduce partial answers. If a NSPs were used in 37b, the second conjunct would become uninterpretable.

The approach defended here explains as well two correlations reported in sociolinguistic studies: correlations between pronominal subject expression and (i) first person singular pronouns (Cameron, 1992; Silva-Corvalán, 1994) and (ii) psychological verbs (Silva-Corvalán, 1994; Travis, 2005). First person singular often serves to convey the speaker’s own opinion, as shown by the fact that they frequently appear with adverbs and prepositional phrases that serve as ‘reinforcers’, as shown in 39<sup>11</sup>.

- (39) a. Yo personalmente estoy de acuerdo.  
“I personally agree.”  
b. Yo por mi parte no iré.  
“I for my part will not go.”

It is, then, not unexpected that first person singular triggers a higher rate of overt pronouns if the speaker wishes to convey that those are exclusively her opinions which may or may not coincide with those of other people. The same argument holds for psychological verbs which express subjective opinions or points of view. Interestingly, OSPs may also appear with psychological verbs that take quirky subjects, as shown in 40.

- (40) Jo, m’ agrada molt.  
I, obj-clitic like a lot.  
I like it a lot.

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<sup>11</sup>I thank an anonymous reviewer for pointing this out.

Also, this approach is consistent with views coming from discourse analysis studies. For instance, Davidson (1996) claims that pronouns serve to increase the ‘pragmatic weight’ of utterances and make them ‘more personally relevant’ and Stewart (2003) claims that overt pronouns are used as a way to hedge the speaker’s opinions and protect their pragmatic face. In fact, these analyses point to facts that are a byproduct of pronouns expressing Contrastive Topics and, thus, bringing about some sense of uncertainty or non-finality about the non-asserted alternatives. The speaker may wish to trigger this uncertainty feeling for politeness reasons: by uttering a contrastive topic in first person singular, the speaker is protecting her face (the “public self-image that every member wants to claim for themselves” (Brown and Levinson, 1987)) and conveying that she is making a modest claim that need not be true of other discourse alternatives.

Finally, this proposal can also capture the interpretation of sentences with strong pronouns in French, as the examples in 41. The equivalence between non-emphatic subject pronouns in null-subject Romance languages and strong pronouns in French has been noted by Rigau (1986) and one of the first characterizations of the meaning of strong pronouns in French is due to Ronat (1979).

- (41) *Moi je resterai.*  
 $I_{strong} I_{weak}$  will stay.  
 “I will stay.”

## 6. Game theory

### 6.1. General concepts

Game theory (GT) is the mathematical framework that studies strategic choice and the ways in which interaction among rational players produces outcomes with respect to the preferences of those players. In linguistics, game theory has mainly been used in semantics and pragmatics since it provides a good framework to explain why speakers and hearers (that is, rational agents) choose a certain action (i.e. utter a sentence or interpret a sentence with a particular meaning in a particular context). Specifically, game theory has been applied to different topics such as the semantics of questions (van Rooij, 2003), discourse anaphora (Clark and Parikh, 2007) and implicatures (Parikh, 2001).

This section briefly explains the basic ideas of game theory, which are applied in the next section to derive the pairing between forms (types of pronouns) and meanings (different contrastive interpretations). A game theoretical model has basically four ingredients: information states, probabilities, actions and payoffs, which I briefly explain here and apply to our case study in the next subsection. In a game, agents interact strategically to achieve some goal, by making different choices among the possible **actions**. For instance, imagine a one player game in which the player needs to decide whether to carry an umbrella or not. Different actions are associated to different values or **payoffs**: for instance, in general the agent might prefer not to carry objects around. However, often preferences depend on the **information state** we are in, on the way the world happens to be. For instance, the agent might prefer to carry an umbrella if it is raining and not if it is sunny. Moreover, sometimes agents are not sure of the information state they are in, and they can only assign **probabilities** to the different information states. If I am in a room without windows, I can estimate the probability that it is raining or not (based on the weather this morning, the forecast, etc.) and decide whether to take an umbrella or not accordingly.

Let us turn now to a communicative situation and see how this model can be applied. In a communicative act, speaker and hearer interact strategically to understand each other, by making different choices among the possible actions. The speaker is trying to convey some information by uttering a form, after having chosen this particular form among the several possible forms she could have used. In turn, the hearer is trying to assign the correct interpretation to the form, among the different interpretations the form could potentially have. Different forms are associated to different payoffs: for instance, both speaker and hearer may prefer shorter forms, which are easier to produce or to process, while at the same time, they also desire to communicate successfully. The information state we are in can have a large effect on the decisions of speakers and hearers: for instance, a hearer is likely to interpret to word 'bank' differently depending on whether he is walking by a river or by a financial institution.

The key concept of game theory is that of Nash equilibrium. A Nash equilibrium is the stable situation in which, given what the other players are doing, no player has any incentive to change their actions. That is, given what every player has chosen, if any player choses to unilaterally defect and do something else, this player will get a worse payoff. In a given game, there may be several Nash equilibriums: the one (or ones) with the highest payoffs,

called Pareto-Nash equilibrium, will be preferred.

There are several types of games used in game theory; in my analysis I use games of partial information. A game of partial information is a game in which, at some point, one agent  $i$  does not know which state  $s$ /he is in because, although  $s$ /he is sure of which action the other player has chosen, the action may correspond to different information states. For example, the lexical ambiguity case mentioned above can be represented by a game of partial information. Imagine a speaker utters the word ‘bank’. The hearer is sure that the speaker has chosen to utter ‘bank’, but, in principle, in the absence of context, he does not know whether the speaker meant ‘edge of a river’ or ‘financial institution’.

### *6.2. Game theory and contrast*

Let me begin this section with a reminder of the pairing between forms and meanings found in Romance null subject languages. These will be the pairings derived by means of game theory.

- A non-focal contrastive overt pronoun is a Contrastive Topic marker, which conveys an uncertainty contrast, by means of the CT-implicature (Hara and van Rooij, 2007). This uncertainty meaning can be coerced as an exhaustive meaning if there are enough contextual cues (if there is one salient alternative in the context or the discourse).
- In cases of double contrast, the overt pronoun cannot be replaced by only a null pronoun, but can be replaced by another contrast marker, such as an adverbial. There is no overall uncertainty meaning.
- Emphatic focal overt pronouns convey exhaustive contrast (see example 31).

The pairing between forms and meanings can be derived through a chain of two games of partial information (Parikh, 2001): Contrast I Game and Contrast II Game. In the first game, Contrast I Game, the hearer plays to choose whether his interpretation is a contrastive or a non-contrastive one. In the second game, Contrast II Game, he plays to see whether the chosen contrastive interpretation is one of uncertainty contrast or exhaustive contrast. In both games, the speaker plays to decide which pronoun, an NSP or an OSP, to utter.

In a game of partial information, the speaker chooses a form and uses it in an utterance. If the form is ambiguous, the hearer has to assign it the correct interpretation. The various choices faced by the speaker and hearer are summarized in Figure 1 for the first game. The root node has two daughters, labeled  $s_1$  and  $s_2$ , corresponding to two information states, that is, two situations speaker and hearer may be in. In particular,  $s_1$  corresponds to the information state in which the speaker does not want to convey any sort of contrast; the utterance is a complete answer to the Question Under Discussion and no contrast with other entities is conveyed;  $s_2$  corresponds to the information state in which the hearer wants to convey some sort of contrast. The speaker (S, in the figure) needs to decide which type of pronoun, NSP or OSP, to use in each information state; the hearer (H, in the figure) needs to decide which interpretation he should give to each pronoun he hears.

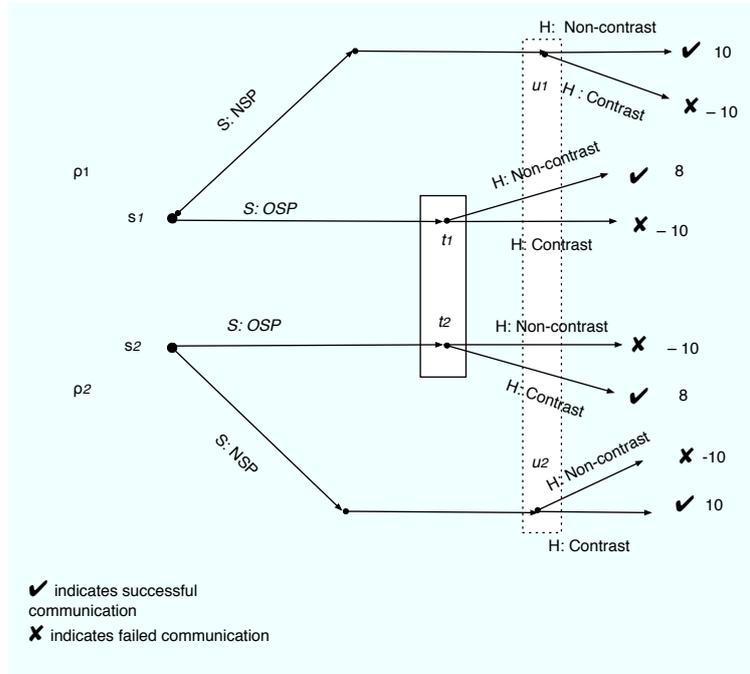


Figure 1: Contrast I Game

The two pronouns are in principle compatible with the two potential interpretations: contrastive or non-contrastive. Whenever an NSP is used, the hearer will not know whether he is in  $s_1$  or in  $s_2$ . The set of information states in which a player thinks he may be is called an information set and it

is represented by circling the states in the set. After having used an NSP, the hearer will be in the information set  $u$ . The OSP is potentially ambiguous in the same way. Thus, after the speaker has used an OSP, the hearer will be in the information set  $t$ .

Each form is associated with different payoffs. Payoffs are indices that indicate preferences: a form with a higher payoff is preferred to a form with a lower payoff. Thus, the particular value assigned to a form is not important to compute the equilibria of the game, but the relationship between the values is crucial. For the purposes of our game, we will assume that NSPs are preferred to OSPs, the former being easier to produce and process than the latter. NSPs will receive a payoff of 10 and OSPs a payoff of 8, which are indicated in the leaves of the tree. A negative payoff of -10 indicates miscommunication. That is, if the speaker wanted to convey contrast, but the hearer assigned a non-contrastive interpretation to the sentence, they have failed to communicate and receive negative payoffs.

Finally, each information state is associated with a particular probability. We will assume here that the probability of  $s_1$ , let us call it  $p_1$ , is greater than the probability of  $s_2$ , let us call it  $p_2$ , the former being a more general, unmarked state of affairs. That is, most sentences do not express contrast, while only a minority of sentences do express contrast.

With this situation we derive the following three Nash equilibria.<sup>12</sup>

- (42) a.  $\{(s_1, \text{NSP}), (s_2, \text{OSP}), (\{t_1, t_2\}, \text{Contrast}), (\{u_1, u_2\}, \text{Non-contrast})\}$ .

That is, the speaker should use an NSP in  $s_1$  and an OSP in  $s_2$ . When the hearer finds himself in the information set  $\{t_1, t_2\}$  (after hearing a sentence with an OSP), he should assign it a contrastive interpretation. When the hearer finds himself in the information set  $\{u_1, u_2\}$  (after hearing a sentence with an NSP), he should assign it a non-contrastive interpretation.

The expected payoff is:  $p_1(10) + p_2(8) = 2/3(10) + 1/3(8) = 28/3$ .

- b.  $\{(s_1, \text{OSP}), (s_2, \text{NSP}), (\{t_1, t_2\}, \text{Non-contrast}), (\{u_1, u_2\}, \text{Contrast})\}$ .

That is, the speaker should use an OSP in  $s_1$  and an NSP in  $s_2$ .

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<sup>12</sup>The calculations assume  $p_1 = 2/3$  and  $p_2 = 1/3$ , but the equilibrium will be the same whenever  $p_1 > p_2$ .

When the hearer finds himself in the information set  $\{t_1, t_2\}$ , he should assign it a non-contrastive interpretation. When the hearer finds himself in the information set  $\{u_1, u_2\}$ , he should assign it a contrastive interpretation.

The expected payoff is:  $p_1(8) + p_2(10) = 2/3(8) + 1/3(10) = 26/3$ .

- c.  $\{(s_1, \text{NSP}), (s_2, \text{NSP}), (\{t_1, t_2\}, \text{Non-contrast}), (\{u_1, u_2\}, \text{Non-contrast})\}$ .

That is, the speaker should use an NSP both in  $s_1$  and  $s_2$ . When the hearer finds himself in the information set  $\{t_1, t_2\}$ , he should assign it a non-contrastive interpretation. When the hearer finds himself in the information set  $\{u_1, u_2\}$ , he should also assign it a non-contrastive interpretation.

The expected payoff is:  $p_1(10) + p_2(-10) = 2/3(10) + 1/3(-10) = 10/3$ .

None of the other strategies are Nash equilibria. For instance, the strategy in 43 is not a Nash-equilibrium because, given that the speaker is using an OSP in  $s_2$ , the hearer should deviate from assigning a non-contrastive interpretation to the information set  $\{t_1, t_2\}$  and assign it a contrastive one. That is, he should deviate to the strategy in 42a and the payoffs of both players would increase from  $10/3$  to  $28/3$ .

- (43)  $\{(s_1, \text{NSP}), (s_2, \text{OSP}), (\{t_1, t_2\}, \text{Non-contrast}), (\{u_1, u_2\}, \text{Non-contrast})\}$

The expected payoff is:  $p_1(10) + p_2(-10) = 2/3(10) + 1/3(-10) = 10/3$ .

The first of the three Nash equilibria, the one in (42a), is the only Pareto-Nash equilibrium of the game, the Nash equilibrium with the highest payoffs. According to this equilibrium, the speaker should use an NSP in  $s_1$  and an OSP in  $s_2$ . Also, when the hearer finds himself in the information set  $\{t_1, t_2\}$  he should interpret the OSP as conveying contrast; when the hearer finds himself in the information set  $\{u_1, u_2\}$  he should interpret the NSP as not conveying contrast.

This equilibrium corresponds to Horn's division of pragmatic labor (Horn, 2004), according to which marked forms express marked meanings and unmarked forms express unmarked meanings. A further prediction of the game

theoretical model is that if probabilities change, the Pareto-Nash equilibrium of the game will also change. That is, if probability  $p_2$  becomes greater than  $p_1$ , then the Pareto-Nash equilibrium would be the second equilibrium of 42, rather than the first one. For the purposes of our game, what could make the probabilities change? What could make a contrastive interpretation more likely than a non-contrastive answer? The adverbials studied by Matos Amaral and Schwenter (2005) are good candidates. Since the adverb is already marking contrast,  $s_2$  becomes more likely and the equilibrium in 42b becomes the Pareto-Nash equilibrium: in these circumstances, the null pronoun can be used felicitously when the speaker wants to convey contrast.

This game also predicts that if the discourse is sensible with and without a contrastive interpretation both types of pronouns will be acceptable. This was the case of the optional contrastive pronouns in 35a and 36a. Both forms are possible and the only difference is whether the selected information state is contrastive or not.

The second game, Contrast II Game, is played only if the optimal interpretation in the equilibrium of Contrast I Game was a contrastive one and the optimal form the OSP. A representation for this game can be seen in figure 2. The information states in this game are also two different interpretations, in this case two different contrastive interpretations: an exhaustive contrast interpretation (the relevant alternatives did not do what is predicated about the referent of the pronoun) and an uncertainty contrast interpretation (it is not known whether the relevant alternatives did or did not do what is predicated about the referent of the pronoun). As usual, in each of the information states, the speaker could potentially use two different linguistic expressions: a non-emphatic overt pronoun and an emphatic overt pronoun, the latter being more marked and requiring more effort than the former. Thus, the payoffs of the non-emphatic overt pronouns should be greater than the payoffs for the emphatic overt pronouns: I assign them a payoff of 8 and 7, respectively. As for the probabilities, note that all instances of exhaustive contrast are a subset of uncertainty contrast, which is less informative and more general. That is, uncertainty contrast is more unspecified and compatible with more state of affairs than exhaustive contrast. This is a clear indication of their relative probabilities: the probability assigned to uncertainty contrast,  $p_1$ , needs to be greater than the one assigned to the exhaustive contrast,  $p_2$ .

As before, whenever one of the pronouns is used, the hearer will not know whether he is in  $s_1$  or in  $s_2$ . After hearing an emphatic OSP he will be in the information set  $\{t_1, t_2\}$ ; after hearing a non-emphatic OSP he will be in

the information set  $\{u_1, u_2\}$ .

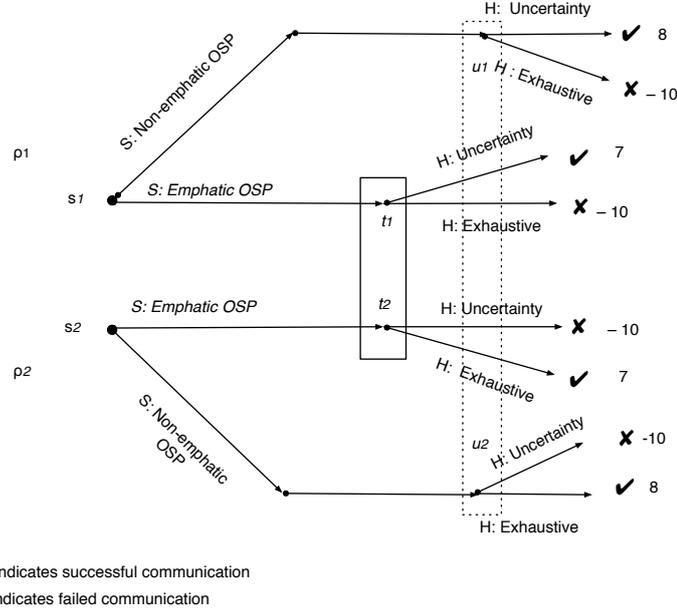


Figure 2: Contrast II Game

With this state of affairs, the game has three Nash equilibria.<sup>13</sup>

- (44) a.  $\{(s_1, \text{Non-emphatic OSP}), (s_2, \text{Emphatic OSP}), (\{t_1, t_2\}, \text{Exhaustive Contrast}), (\{u_1, u_2\}, \text{Uncertainty Contrast})\}$ .

That is, the speaker should use a non-emphatic OSP in  $s_1$  and an emphatic OSP in  $s_2$ . When the hearer finds himself in the information set  $\{t_1, t_2\}$  (after hearing a sentence with an emphatic OSP), he should assign it an exhaustive contrast interpretation. When the hearer finds himself in the information set  $\{u_1, u_2\}$  (after hearing a sentence with a non-emphatic OSP), he should assign it an uncertainty contrast interpretation.

The expected payoff is:  $p_1(8) + p_2(7) = 2/3(8) + 1/3(7) = 23/3$ .

<sup>13</sup>The calculations again assume  $p_1 = 2/3$  and  $p_2 = 1/3$ , but the equilibrium will be the same whenever  $p_1 > p_2$ .

- b.  $\{(s_1, \text{Emphatic OSP}), (s_2, \text{Non-emphatic OSP}), (\{t_1, t_2\}, \text{Uncertainty Contrast}), (\{u_1, u_2\}, \text{Exhaustive Contrast})\}$ .

That is, the speaker should in  $s_1$  use an emphatic OSP and in  $s_2$  a non-emphatic OSP. When the hearer finds himself in the information set  $\{t_1, t_2\}$  (after hearing a sentence with an emphatic OSP), he should assign it an uncertainty contrast interpretation. When the hearer finds himself in the information set  $\{u_1, u_2\}$  (after hearing a sentence with a non-emphatic OSP), he should assign it an exhaustive contrast interpretation.

The expected payoff is:  $p_1(7) + p_2(8) = 2/3(7) + 1/3(8) = 22/3$ .

- c.  $\{(s_1, \text{Non-emphatic OSP}), (s_2, \text{Non-emphatic OSP}), (\{t_1, t_2\}, \text{Uncertainty Contrast}), (\{u_1, u_2\}, \text{Uncertainty Contrast})\}$ .

That is, the speaker should use a non-emphatic OSP both in  $s_1$  and  $s_2$ . When the hearer finds himself in the information set  $\{t_1, t_2\}$ , he should assign it an uncertainty contrast interpretation. When the hearer finds himself in the information set  $\{u_1, u_2\}$ , he should also assign it an uncertainty contrast interpretation.

The expected payoff is:  $p_1(8) + p_2(-10) = 2/3(8) + 1/3(-10) = 6/3$ .

There are no other other Nash equilibria and the only Pareto-Nash equilibrium is the one in 44a. Again, the game of partial information derives the division of labor between emphatic and non-emphatic OSPs and two different contrastive interpretations: non-emphatic OSPs serve to express less informative, more general uncertainty contrast and emphatic OSPs serve to express the more informative, more specific exhaustive contrast.

The prediction is again that this Pareto-Nash equilibrium can be altered and that the non-emphatic OSPs can successfully convey an exhaustive contrast. I argue that this happens precisely in two cases identified before: (i) when there is one salient alternative in the context, that is, in cases of implicit contrast (see examples 12a and 12b) and (ii) when there is one salient alternative in the discourse, that is, in cases of double contrast (see examples 5a and 5b). In both cases,  $p_2$  becomes greater than  $p_1$ . In one case, there is a salient alternative in the context and the referent of the pronoun is in contrast with this alternative. In the other case, the salient alternative, which the referent of the pronoun contrasts with, is in the discourse itself. The fact that there is this salient alternative is able to make the probabilities switch and the non-emphatic OSP can express an exhaustive contrast. In all other

cases, an emphatic OSP needs to be used to convey an exhaustive contrast.

## 7. Conclusion

Although there seem to be different kinds of contrastive overt pronouns in Romance, I have argued that all non-focal contrastive pronouns are in fact Contrastive Topic markers, in the sense of Hara and van Rooij (2007). A Contrastive Topic interpretation triggers topic alternatives and conveys an uncertainty contrast: an implicature that the truth of the alternatives is not known to the speaker. This uncertainty contrast can be coerced into an exhaustive contrast (an implicature that conveys that the relevant topic alternative is false) if they are enough contextual cues: namely, there needs to be a salient relevant alternative either in the context or in the discourse.

These pairings between forms and meanings were derived by having a chain of two games of partial information, which matched unmarked, frequent meanings with unmarked, cheap forms and marked, infrequent meanings with marked, expensive forms.

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