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# The relevance of the semantic context in inter-understanding: an example based on the interpretation of Italian from Spanish

La relevancia del contexto semántico en intercomprensión: un ejemplo basado en la interpretación del italiano desde el español

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## Fechas · Dates

Recibido: 2019-05-30  
Aceptado: 2019-11-15  
Publicado: 019-12-31

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## Cómo citar este trabajo · How to Cite this Paper

López-Astorga, M.; & Torres-Bravo, L. (2019). The relevance of the semantic context in inter-understanding: an example based on the interpretation of Italian from Spanish. *Publicaciones*, 49(5), 149-160. doi:10.30827/publicaciones.v49i5.9179

## Abstract

This paper reports a study model for further research carried out with four participants in order to show that the general theses held in works such as, for example, the one of López-Astorga in 2017 about linguistic inter-understanding deserve to be considered. The goal is to support the idea that such theses are clearly useful to describe the mental processes that actually happen when individuals speaking a particular language try to interpret another language that, while it is different from theirs, it is also very similar or close to it. The theses basically claim that those mental processes have to be akin to inductions such as described by the mental models theory. So, this last approach is assumed here as well. In this way, the main conclusion of the study, whose participants were Spanish-speaking students that had to interpret firstly an Italian word and then a complete sentence with that very word in that same language, and who did not know Italian, is that, in accordance with the aforementioned theses, the semantic context in which a word is can be essential in the linguistic processes of inter-understanding.

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Keywords: induction; inference; inter-understanding; mental models; semantics

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## Resumen

Este trabajo presenta un modelo de estudio para futuras investigaciones realizado con cuatro participantes con el fin de mostrar que las tesis generales defendidas en textos como, por ejemplo, el de López-Astorga en 2017 sobre la intercomprensión lingüística merecen consideración. El objetivo es apoyar la idea de que tales tesis son claramente útiles para describir los procesos mentales que realmente ocurren cuando los individuos que hablan un idioma concreto tratan de interpretar otro idioma que, si bien es diferente al suyo, es también muy similar o cercano a él. Las tesis, básicamente, establecen que esos procesos mentales tienen que ser semejantes a inducciones como las descritas por la teoría de los modelos mentales. Por tanto, este último enfoque también se asume aquí. De esta manera, la conclusión principal del estudio, cuyos participantes fueron estudiantes hispano parlantes que tenían que interpretar, en primer lugar, una palabra en italiano y, a continuación, una oración completa con esa misma palabra y en ese mismo idioma, y que no sabían italiano, es que, de acuerdo con las mencionadas tesis, el contexto semántico en que una palabra está inserta puede ser esencial en los procesos lingüísticos de intercomprensión.

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Palabras clave: inducción; inferencia; intercomprensión; modelos mentales; semántica

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## Introduction

In works such as, for example, that of López-Astorga (2017), it has been proposed that there is a clear relationship between the linguistic inter-understanding processes and certain mental processes that, following the mental models theory (Johnson-Laird, 2012; Johnson-Laird, Girotto, & Lengrenzi, 1999; Johnson-Laird, Khemlani, & Goodwin, 2015; Quelhas, Rasga, & Johnson-Laird, 2017), human beings habitually make. In particular, the mental processes considered are those referring to inductive inferences and, in this paper, we describe a practical study whose results seem to show that, indeed, that idea is correct.

Our study here is based on four cases and, as far as we know, is different from previous researches such as the one of López-Astorga (2017) in several ways, some of them being more superfluous and others of them being more relevant. Firstly, as said, it is

a study considering four cases. Secondly, it is focused on the interpretation of Italian by Spanish-speaking individuals (and other works assuming the theses based on the mental models theory resort to other languages). However, maybe what is more important is that, as accounted for below, the study tries to prove that a word that it is not usually understood by people speaking a different language can be so if it appears in a sentence providing it a semantic context, the great new feature being that this is done from the framework of the mental models theory. Of course, this idea is already present in other works (in fact, the relevance of the semantics and meaning seems to be already somehow or other pointed out in most general works about inter-understanding, even although they do not consider the mental models theory), but the aim here is to give further evidence in favor of it by means of a particular task and the results obtained by four participants after executing it. Thus, because we do not know another similar proposal, we think that this is the first study based on the mental models theory that intends to reveal, in a way that is not purely theoretical and presenting a translation task to several participants, the specific role that is played by the meanings of the words that are in the same sentence in the understanding of a particular word that is a priori hard to interpret for people speaking a close language. In this manner, as also commented on below, what the study really tries to show is that the way participants often respond to tasks such as the one used in it suggests that two ideas held in previous works should be absolutely taken into account: i) that a concept that is very relevant for the aforementioned theory, that is the concept of semantics, is also essential in linguistic inter-understanding, and ii) that the phenomenon of inter-understanding is clearly linked to induction as explained by the mental models theory.

Nevertheless, before presenting our study, analyzing its results, and drawing some conclusions from them, it appears to be necessary to better describe the framework focused on the mental models theory formulated in papers such as that of López-Astorga (2017) and how the mental processes proposed by this last theory that, according to works such as that paper, occur in inter-understanding situations are exactly. The next section is devoted to this.

## Semantic possibilities and inter-understanding

The mental models theory, mainly developed by Philip Johnson-Laird and his collaborators, is a psychological approach accounting for human reasoning. Its main idea seems to be that reasoning mostly deems the semantic possibilities that can be derived from asseverations (Johnson-Laird, 2012). In this way, it can be said that, following this theory, reasoning is basically to identify, combine, and, when suitable, remove possibilities (Orenes & Johnson-Laird, 2012).

Furthermore, semantics (and, of course, pragmatics too) is much more important for it than syntax. And this is so because the meanings of their words help us understand the sense of sentences to a greater extent than their syntactic structures (Johnson-Laird, 2010). Nonetheless, what is more relevant for this paper is how the theory explains the induction processes. An explanation in this way is to be found, for example, in Johnson-Laird (2012). However, given that López-Astorga (2017) resorts to that very account and bases on it, our explicit explanation in this regard here will consider these two last works. The example of induction given by Johnson-Laird is as follows:

“The starter won’t turn. Therefore, the battery is dead” (Johnson-Laird, 2012, p. 146; López-Astorga, 2017, p. 13).

The reason why one might come to the conclusion ‘the battery is dead’ from the premise ‘the starter won’t turn’ can be explained paying attention to the semantic possibilities that can be thought by combining all the situations that can happen with regard to a starter and a battery. Such possibilities are these ones (López-Astorga, 2017, p. 13; Johnson-Laird, 2012, p. 146):

- [I]:(the battery is dead) & (the starter turns)
- [II]:(the battery is dead) & (the starter does not turn)
- [III]:(the battery is not dead) & (the starter turns)
- [IV]:(the battery is not dead) & (the starter does not turn)

[I], [II], [III], and [IV] are semantic possibilities. [I] stands for a situation in which both the battery is dead and the starter turns. However, [II] represents a scenario in which, although the battery continues to be dead, the starter does not turn. On the other hand, the situation of [III] is that the battery is not dead and the starter turns. Finally, [IV] denotes a model in which neither the battery is dead nor the starter turns.

Thus, based on the accounts provided by Johnson-Laird and López-Astorga, it can be said that the premise ‘the starter won’t turn’ removes [I] and [III], since, as stated, the starter turns in them, and that the problem is hence why, as the conclusion ‘the battery is dead’ suggests, possibility [II] is preferred over possibility [IV]. As it can be seen in the mentioned works, the explanation of the mental models theory is simple: [II] is usually preferred because, based on general knowledge and past experiences, one might think that it is more probable that the battery is dead and the starter does not turn than that the battery is not dead and the starter does not turn. And this is the way the theory generally accounts for the induction processes.

But what is interesting for this paper is the manner this account is applied to linguistic inter-understanding in works such as that of López-Astorga (2017). As it is well known, linguistic inter-understanding refers to circumstances in which individuals that are not able to speak or write a language do be able to understand it, listening it or reading it (Bonvino, Caddeó, Vilagínés, & Pippa, 2015; Chávez Solís & Erazo Muñoz, 2014; Decandio & Dolz, 2015; Wilke & Lauría de Gentile, 2016). Following the literature on it, inter-understanding can happen between very close languages in a natural way, and López-Astorga (2017) resorts to two tongues that are actually similar: Spanish and Portuguese. Thus, from a text taken from Bompastor Borges Dias and Roazzi (2003), he proposes that, in a message in Portuguese, a Spanish-speaking individual can find words equal or very akin to words in Spanish, but also words very different that are very hard to link to a word in Spanish. However, maybe his approach can be better understood by means of an example. A sentence in the Portuguese text used by López-Astorga is as follows:

“...é atribuída pelos defensores da teoria da lógica mental à utilização...” (Bompastor Borges Dias & Roazzi, 2003, p. 45; López-Astorga, 2017, p. 15).

The translation of this sentence into English given by López-Astorga is the following:

“...[it] is attributed, by the proponents of the mental logic theory, to the use...” (López-Astorga, 2017, p. 15).

Nevertheless, what is relevant here is that a version of it in Spanish can be very similar to the original version in Portuguese:

“...es atribuída por los defensores de la teoría de la lógica mental a la utilización...”  
(López-Astorga, 2017, p. 15).

And López-Astorga (2017) exact proposal is that a Spanish-speaking person that does not know Portuguese, faced to the Portuguese version, will make inductive inferences taking the probability of each possibility into account, the general possibilities schemata being these ones:

[V]:(x = y)  
[VI]:(x ≠ y)

Where ‘x’ is a particular Portuguese word and ‘y’ is a particular Spanish word.

In this way, as said, the individual will make a decision with regard to these possibilities paying attention to their probability, which will lead him/her to prefer [V] or [VI], as the case may be. Clearly, there are words that are identical or almost identical in the Portuguese and Spanish versions, for example, *atribuída-atribuída* (attributed), whose only difference in the two languages is the tilde in Portuguese, and *defensores* (proponents) or *lógica* (logic), which are exactly identical both in Portuguese and in Spanish. In cases such as these ones, the possibilities would be similar to the following:

[Va]:(*atribuída* = *atribuída*)  
[VIa]:(*atribuída* ≠ *atribuída*)  
[Vb]:(*defensores* = *defensores*)  
[VIb]:(*defensores* ≠ *defensores*)  
[Vc]:(*lógica* = *lógica*)  
[VIc]:(*lógica* ≠ *lógica*)

Obviously, given these alternatives, the individual will consider that [Va], [Vb], and [Vc], which are instances of [V], are the most probable scenarios. Likewise, continuing to follow López-Astorga’s paper, something similar can occur with words that, while they are not equal in Portuguese and Spanish, they are very similar in those two languages. This is the case of, for example, *utilização* (use), which corresponds to *utilización* In Spanish. Now, the scenarios would be:

[Vd]:(*utilização* = *utilización*)  
[VIId]:(*utilização* ≠ *utilización*)

And, evidently, because of the similarity between the two words, it can be expected that [Vd], which is an instance of [V] too, will keep being the alternative preferred by Spanish-speaking people.

Nevertheless, the situation is very different in the case of other words such as *pelos*. As indicated by López-Astorga (2017, p. 15), this last Portuguese word can be translated into English as ‘by the’ (if the substantive linked to ‘the’ is masculine and is in plural), but it refers to ‘hairs’ in Spanish. Therefore, it should be very hard to note that the correct translation of *pelos* into Spanish is *por los* (‘by the’, again, when ‘the’ is related

to a masculine plural noun), and not the identical word *pelos* (which, as said, means in Spanish 'hairs'), for a Spanish-speaking individual. Thus, it can be thought that, in this circumstance, the choice between these two possibilities would not be a priori so easy:

[Ve]:(*pelos* = *por los*)

[VIe]:(*pelos* ≠ *por los*)

Indeed, in principle, there are no clear reasons to make a decision with regard to these two alternatives, which are the scenarios [XI] and [XII] in López-Astorga (2017, p. 17). Nonetheless, as also indicated in this last paper, the semantic context can help one decide. *Atribuida* ('attributed') often denotes in Spanish an action made by (*por*) somebody, and, given that it can be assumed that *defensores da teoría da lógica mental* ('proponents of the mental logic theory') will be, because of the fact that these words are very akin to their corresponding words in Spanish, interpreted correctly as *defensores de la teoría de la lógica mental*, it can also be predicted that this last expression will be related to *atribuidas* using *por* ('by'), and that, since *defensores* ('proponents') is a Spanish masculine substantive and is in plural, *los* (i.e., 'the' in the masculine and plural case) will be added too, the final result being *atribuida por los defensores de la teoría de la lógica mental* (López-Astorga, 2017, p. 17).

In this way, the main goal of this paper is to show, by means of a practical study with four participants, that actions of the semantic context of words such as this one really happen in inter-understanding situations. As said, the languages taken into account in our study are not Portuguese and Spanish, but Italian and Spanish. Obviously, this is not a problem, as Italian and Spanish are very close languages as well. However, the exact characteristics of our research are described in the next pages.

## Method

### Participants

As indicated, the participants were four. All of them were undergraduate students, and their descriptions are these ones:

Participant 1: Speech Therapy student, female, 20 years old.

Participant 2: Psychology student, male, 20 years old.

Participant 3: Psychology student, female, 22 years old.

Participant 4: Architecture student, male, 21 years old.

They were randomly selected between all the students of a Chilean university and met the inclusion criterion, which was to have never studied Italian. The four participants are Chilean and hence Spanish-speaking individuals.

## Design

Given that we wanted to deeply study a particular problem (the action of the semantic context in the interpretation of a word in a language different from but akin to the

mother tongue) and the exact factors having an influence on it, following Efrat Efron and Ravid (2013), we thought of resorting to a methodology based on case study. That is an instrument usually applied to one participant but we selected four participants because, as Efrat Efron and Ravid (2013) also point out, more cases can be considered too in order to compare them and their results, and, in this way, four cases seemed a better methodological option for the particular study we attempted to carry out. So, the study was actually a qualitative case study focused on four students (for further information on similar kinds of studies and more references about case studies, as well as their application to the mental models theory (Torres-Bravo & Gairín-Sallán, 2019)). Thus, the task presented to the participants, which was specially built for this study, consisted of two activities. Firstly, they were asked to indicate the meaning of an Italian word. Secondly, they had to translate a complete sentence in Italian in which that very word was included into Spanish. Obviously, the word chosen for the first activity was a word difficult to understand for a Spanish-speaking person, since it was akin to several words in Spanish, and the sentence provided a semantic context that, predictably, would enable to note its actual meaning.

Likewise, they could spend all the time they considered suitable to execute the task, and, evidently, all the ethical aspects that need to be taken into account in studies of this kind were reckoned.

## Materials and procedure

The word used in the first activity was *particelle* ('particles'), whose translation into Spanish is *partículas*. Clearly, the two words, the Italian one and the Spanish one, begin with the same four letters ('partic'). Nevertheless, it is not easy to note the correspondence because there are a number of Spanish words beginning with those very letters.

As far as the sentence giving a semantic context to word *particelle* is concerned, it was taken from Decandio and Dolz (2015). That is a work in which is reported a study on the use of correspondence to develop inter-understanding abilities in school students, and the selected sentence was part of a letter written in Italian by a student from Geneva and addressed to two Brazilian students. It was as follows:

"C'è il CERN, uno dei più prestigiosi laboratori di fisica nucleare del mondo e il più grande acceleratore di particelle del mondo" (Decandio & Dolz, 2015, p. 284).

A translation of it into English can be this one:

'There is the CERN, one of the most prestigious laboratories of nuclear physics around the world and the greatest particle accelerator around the world'.

In this way, in the first activity the participants received a sheet of paper with just a question in Spanish: 'What does the word *particelle* mean?' On the other hand, in the second activity, they were given the previous sentence in another sheet of paper in which there were also instructions asking for translating it into Spanish.

## Results

The responses obtained from the participants were the following:

### Participant 1:

- Translation of *particelle*: *participación o participar* ('engagement or to participate').
- Translation of the complete sentence: "El CERN, uno de los prestigiosos laboratorio de física nuclear del mundo y el que tiene el más grande acelerador de partículas del mundo" ('the CERN, one of the prestigious laboratories of nuclear physics around the world and the one that has the greatest particle accelerator around the world').

### Participant 2

- Translation of *particelle*: *división* ('split').
- Translation of the complete sentence: "Un prestigioso laboratorio de física nuclear del mundo y el más grande acelerador de partículas del mundo" ('a prestigious laboratory of nuclear physics around the world and the greatest particle accelerator around the world').

### Participant 3:

- Translation of *particelle*: *un evento festivo* ('a party').
- Translation of the complete sentence: "CERN, es uno de los laboratorios de física nuclear en el mundo y tiene el acelerador de partículas más grande del mundo" ('CERN, it is one of the laboratories of nuclear physics around the world and it has the greatest particle accelerator around the world').

### Participant 4:

- Translation of *particelle*: *partición* ('split').
- Translation of the complete sentence: "C'è il CERN, uno de los laboratorios más prestigiosos de Física Nuclear del mundo y el más grande acelerador de partículas del mundo" ('C'è il CERN, one of the most prestigious laboratories of nuclear physics around the world and the greatest particle accelerator around the world').

As it can be noted, some of the responses given by the participants are not written in absolutely correct Spanish and there are some grammatical errors. This is so because we have reproduced exactly what the participants wrote in their sheets of paper, not modifying even the mistakes made by them. But perhaps what is really important here is that none of the participants could give the right translation of the word *particelle* when it was presented alone. However, all of them could correctly translate it when it was part of the sentence providing a semantic context. Certainly, probably because of their similarity to the corresponding Spanish words, all the participants understood that the sentence was speaking about a laboratory of nuclear physics, and, given that



the word *acceleratore* ('accelerator') was also understood, a context in which the word *particelle* could be suitably interpreted was built, which confirms the López-Astorga's (2017) thesis related to the semantic context commented on above. Let us explain this in more detail.

In the first activity of the task, when the word *particelle* was not included in any sentence, the alternatives are simply these ones:

[Vf]:(*particelle* = *partículas*)  
[VI f]:(*particelle* ≠ *partículas*)

Nevertheless, since many Spanish words (and in other languages such as English; see the comment on the response given by Participant 3 below) are, as said, akin to *particelle*, it seems that [Vf] was not even considered by the participants. Participant 1 thought that the word could mean 'engagement' or 'to participate', that is, two words that begin in Spanish by 'partic' as well (*participación* and *participar*). Participant 2 attributed the meaning *división* ('split') to it. Clearly, *división* is not a word similar to *particelle*, but there is no doubt that it is semantically related to other Spanish words that do be, for example, *partición* (which also begins with 'partic' and also means 'split'). As far as Participant 3 is concerned, she appeared to commingle Italian with English and responded '*un evento festivo*', which is an expression that can be translated into English as 'party', that is, a word that shares with *particelle* the beginning 'part'. Finally, Participant 4 assigned the word *partición* to it, i.e., a word that, as indicated, begins as *particelle* as well and should be translated as 'split'. So, it is clear that they did not think in an immediate or direct way in [Vf]. As pointed out, there are a number of words in Spanish that can be related to *particelle*, and the problem got even worse in the case of Participant 3, who seemed to link the word to a word in English, and not in Spanish.

Nonetheless, the other important result is, as claimed, that, in the sentence of the second activity, the word *particelle* did be understood properly in the four cases. Indeed, beyond some mistakes made by them in their translations of the sentence, all of them seemed to understand, as also indicated, because of the semantic context built by the information in the sentence, that *partículas* ('particles') was the right translation for *particelle*. And this was so because then x and y in [V] and [VI] did not represent simple words anymore, but they included more data. As shown too, the four participants knew that the sentence spoke about a laboratory of nuclear physics and an accelerator. So, in the case of this second activity, the instances of [V] and [VI] were:

[Vg]:(*laboratorio de física nuclear – acelerador de 'particelle' = laboratorio de física nuclear – acelerador de partículas*)  
[VIg]:(*laboratorio de física nuclear – acelerador de 'particelle' ≠ laboratorio de física nuclear – acelerador de partículas*)

That is, in English:

[Vg]:(*laboratory of nuclear physics – particelle accelerator = laboratory of nuclear physics – particle accelerator*)  
[VIg]:(*laboratory of nuclear physics – particelle accelerator ≠ laboratory of nuclear physics – particle accelerator*)

In this way, the concepts of laboratory, nuclear physics, and accelerator made [Vg] clearly more probable than [VIg] in this activity. True, if we are speaking about nuclear

physics and, in addition, in the same context, we use the word ‘accelerator’ linked to the word *particelle*, given that in Spanish ‘accelerator’ (*acelerador*), in a physics context, is often, as in many other languages, used along with the word ‘particle’ (*partículas*), that is, along with a word that shares the beginning ‘partic’ with *particelle*, the probability of [Vg] significantly increases. And this is so even if one does not know anything about physics and particle accelerators, since this last expression is, as indicated, generally familiar for general population, whether they know what a particle accelerator is exactly and how it works or not.

But, if all of this is so, the results of our study are another evident confirmation of the theses held in papers such as the one of López-Astorga (2017). As explained above, such theses refer to the idea that, in linguistic inter-understanding circumstances, the interpretation processes are akin to the induction processes in the way they are described by the mental models theory.

## Conclusions

Obviously, the conclusions that we can derive from our study are also very similar to those that are provided in works such as that of López-Astorga (2017). First, our results give support to the general framework of the mental models theory, especially to the aspects of it related to linguistic abilities. This is important because, as López-Astorga also suggests, based on the predictions of the aforementioned theory, we can anticipate words, expressions, and situations that can cause understanding problems between close languages, which in turn can allow us to work in the suitable direction to prevent such problems.

On the other hand, as far as we know, this is the first study about linguistic inter-understanding assuming the mental models theory focused on the relationships between Italian and Spanish. Indeed, other researches assuming this last approach resort to other Romance languages, and this is relevant too because it reveals that it is true that the ideas that can be derived from the framework of the mental models theory seem to be valid in the case of different languages, which, as López-Astorga (2017) points out as well, can help us discover ways to little by little teach to understand increasingly more different languages. Thus, we can go from a Romance language to another Romance language, and, progressively, we can come to other languages that, although they have lexical and grammatical communalities with Latin, are not Romance languages, the final result being the development of the ability to understand even tongues very far from the Romance ones. And, of course, this same process can also be begun from any language not coming from Latin. Our example in this paper is about Romance languages because it appears that until now the mental models theory has been applied to the study of inter-understanding only in the case of those languages. However, there is no doubt that the results obtained with such languages can easily be considered for languages of other kind too. Evidently, these points refer to possible use of the model proposed here.

Hence we can think that the conclusions of studies such as the one carried out here can be valid, in general, for any close languages. It is indisputable that our research, as other similar works, has certain limitations. An experiment with more participants could have been thought and quantitative analyses could have been made from their responses too. However, following again López-Astorga’s ideas, those tasks can be trivial for issues such as the one addressed here, as it can be supposed that the results

that could be found by making them would not be very different from those achieved in this paper, and that, therefore, the information that we could get in that way would be obvious and a priori known.

In any case, some points are clear. Firstly, it seems that it can be interesting to continue to work on linguistic inter-understanding with the support of the mental models theory. As said above, this can help us identify problematic aspects and, therefore, detect the exact matters requiring special attention in the teaching-learning processes related to interpretation and comprehension of languages. Furthermore, as also indicated, all of this also provides evidence for the general ideas of the mental models theory, which appears to be turning into the best alternative accounting for and predicting human intellectual activity. Maybe the developments of this theory in the future will progressively enable to give better explanations and descriptions of the intellectual phenomena involved in the inter-understanding processes as well. So, from this point of view, perhaps the researchers working on those processes should pay more attention to the advances and achievements of the mental models theory too.

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