Focus Particles in Information Processing: An Experimental Study on Pragmatic Scales with Spanish *incluso*

Óscar Loureda, Adriana Cruz, Martha Rudka, Laura Nadal and Inés Recio (Heidelberg), Margarita Borreguero Zuloaga (Madrid)[1]

Abstract

Focus particles have been one of the spotlights of linguistic research during the last fifty years. They have been studied mainly from a syntactic and semantic perspective, in formal and functional approaches. However, in the last years new insights in this field have been developed through pragmatic and textual approaches. From that perspective, focus particles can be considered as a type of discourse particles, as far as their semantic nature and their pragmatic function are concerned. In this paper, we claim that experiments on text processing may help to support this view: by analyzing eye movements during reading and by testing the effective comprehension of utterances, we can demonstrate the key role of the Spanish scalar additive particle *incluso* ('even') in the process of information retrieval.

1 Introduction

According to one fundamental principle of pragmatics in particular and of linguistics in general, not all utterances require the same processing efforts. The cognitive oriented Relevance Theory (Sperber/Wilson 1995, 2002; Wilson/Sperber 2002; Wilson 2003) provides an account of the dynamics of communication in which it is assumed that utterances are ostensive stimuli intended for a hearer/reader, who forms mental representations to recover the communicated assumption[2]. When confronted with an utterance such as *Alicia sabe multiplicar, incluso dividir* ('Alicia can multiply, even divide') in Spanish, a reader will first try to recognize who Alicia is (by means of a *saturation operation*, Recanati 2002). He will then ascertain that *dividir* ('divide') refers to an arithmetic operation and not to the mere action of division (*disambiguation*, Carston 2002). Finally, the reader will process the instruction triggered by the focus adverb *incluso* ('even'), which introduces a scalar information structure with a common topic (the arithmetic operations that Alicia is able to do), in which one

[1] All authors have taken part in the planification, development and execution of the experiment as well as in the writing of the paper.

[2] "Verbal ostensive stimuli – our words – do not correspond to an exhaustive representation of reality. Instead, they constitute an underdetermined semantic template which, on the one hand, *allows* and, on the other hand, *determines* the mental representation formed by the hearer/reader." (Portolés 2004: 61, our translation and our italics).

element (*dividir,* 'divide') has a higher information load than the one presented as the alternative (*multiplicar,* 'multiply') (Rooth 1985; Portolés 2007, 2009, 2010).

A further argument, implicitly or explicitly shared by all studies on information structure in discourse, claims that information is not homogeneously distributed within utterances. Firstly, because under normal conditions the right and the left sides of the utterance do not structurally carry the same information load; and, secondly, because languages have strategies to distribute information in a non-homogeneous way. Utterance articulation in theme and rheme, dislocation, topicalization or focalization of the text constituents are, in fact, different ways to distribute the information throughout the text to accommodate it to the discourse dynamics and to the interlocutors' knowledge. In current linguistic research, this is referred to as *discourse information structure*.

If utterances are comprehended by means of inferential computations, languages should be expected to have specific devices at their disposal that minimize the cognitive effort of the addressee in his purpose to process the information structure of what is uttered. According to Blakemore (1997: 95), the conceptual meaning corresponds to the lexical information of the propositional content of an utterance, whereas the procedural meaning is the information on how to process conceptual meanings and on how to constrain the inferential computations undergone when processing the discourse sequences in which the elements with a procedural meaning occur[3]. Particularly this leads to a further argument often mentioned in studies on discourse particles that we wish to emphasize: due to their fundamentally procedural meaning, discourse particles constrain the inferential processes in communication in order to guide the hearer or reader to the expected effects, thus minimizing processing efforts. As a result, it seems plausible that they constitute an attentional focus for discourse comprehension and production (cf. Blakemore 1987, 1992, 1997; Sperber/Wilson 1995; Portolés 2001 [1998]; Carston 2002, 2004; or Murillo 2010).

Experimental studies of psychological nature provide a good insight into the reactions (processing efforts) to given stimuli (utterances). This is precisely the aim of our research, in which we make use of eye-tracking techniques to gather information about the online cognitive processes occurring during a certain mental activity by registering eye-movements in reading (Richardson et al. 2007). In this contribution we present some results obtained in our experimental studies that strengthen the arguments on information processing mentioned above, especially those concerning processing guided by focus particles. Specifically, we aim at proving that the meaning of focus particles is indeed of procedural nature, and that focus particles are linguistic guides for comprehension that impose a certain information pattern in the utterances in which they occur, highlighting some areas and backgrounding others. The effect of focus particles on discourse processing, however, also depends on their specific

[3] To be more specific and according to recent theoretical proposals in lexical pragmatics (Carston 2002, 2004), the conceptual meaning is the information on the propositional content of *mental representations* which are codified by the utterances. As linguistic meaning is to a great extent underspecified and cannot be correctly interpreted without taking the context into account, utterances are no longer considered as consisting of propositions or having truth conditions: only the pragmatically enriched mental representations can have them (vgl. Murillo 2010: 243).

semantic and syntactic properties, as well as on the interaction between such properties and the other elements of the utterance.

In this paper we focus on the "additive" (König 1991) Spanish focus particle *incluso* ('even'). Our specific aim is to analyse empirically to what extent *incluso* conditions the processing efforts of utterances with an unmarked order of constituents (SVO), as well as its effect on information retrieval in utterances with pragmatic scales (van Kuppevelt 1996; Schwenter 1999; Portolés 2007).

2 Information focus (unmarked focus) vs. contrastive focus (marked focus)

When planning a discourse, speakers take into account who their addressee is and presuppose that he has a certain amount and kind of knowledge about what is being conveyed. The presuppositions about the hearer's cognitive environment determine the way information is organized in discourse, especially the distribution of given and new information along the utterance, or, more precisely, the distribution of *background* and *focus information*. A hearer who identifies *dividir* ('divide') and *incluso* ('even') within the utterance *Alicia sabe incluso dividir* ('Alicia can even divide') presupposes that his interlocutor assumes that Alicia is able to do arithmetic operations other than divide, but, at the same time, he finds this ability more remarkable than others or he is surprised by the fact that Alicia is able to divide as well. Because of its semantic meaning, *incluso* ('even') creates a specific information structure: something is less expectable than something else (cf. Portolés 2010).

A focus type that merely widens and extends the 'common ground' is usually referred to as *unmarked focus* (Trager/Smith 1951), *information focus* (Jackendoff 1972; Kiss 1998; Roberts 1998; Kenesei 2005), *neutral focus* (Zubizarreta 1999), *semantic focus* (Gundel 1999) or *completive focus* (Dik 1989; Andorno 2000). In absence of further prosodic, lexical or grammatical instructions, in Spanish, the right side of an utterance is the most informative area by default. Hence, any sentence constituent located in this area functions as an unmarked focus:

(1) Alicia sabe $\text{dividir}_{\text{unmarked focus}}$

[Alicia can divide]

In a given context (parting from an underlying question like 'What can Alicia do?'), in the utterance *Alicia sabe dividir* ('Alicia can divide') we can identify known information: 'Alicia can do x'; and new information: 'divide'. The speaker may decide to set the focus on a different element merely by shifting the prosodic stress to any element of the utterance creating a so-called *marked focus* in the structural level, i. e. a focus that occupies a position other than the final one:

(2) $\text{Alicia}_{\text{marked focus}}$ sabe dividir

[$\text{Alicia}_{\text{marked focus}}$ can divide]

The main difference between a marked and an unmarked focus is that "the marked focus may supply a piece of information that is required at a given point in the discourse, or substitute a correct piece of information for an incorrect one" (Taglicht 1994: 999). This explains why, focusing on its role in the information level and not so much in the structural level, the

marked focus has also been called *contrastive focus*, because it signals a contrast between the element on focus and other alternative elements. For example, in:

(3) Alicia sabe *incluso* dividir[4] $_{\text{scope/marked focus}}$

[Alicia can *even* divide]

the focus *dividir* ('divide') is presented as a contrastive focus, since, due to the meaning of *incluso*, its value is conventionally determined in relation to other alternatives (Rooth 1985), which are not sintagmatically given here. By contrast, in (4), the alternative *multiplicar* ('multiply') is explicitly contrasted with the focus *dividir* ('divide'):

(4) Alicia sabe multiplicar$_{\text{alternative}}$, *incluso* dividir$_{\text{scope/marked focus}}$

[Alicia can multiply, *even* divide]

As a result, the term *focus* can refer to two phenomena: the unmarked focus and the marked or contrastive focus. Although in principle any focus may evoke an alternative, there are some remarkable differences between the unmarked and the marked focus regarding their relation to the alternative. Whereas the unmarked focus is typically located in the rheme component of the utterance, usually conveys the new information and its focusing value arises from the interplay with other constituents in the syntagmatic axis, the marked or contrastive focus (be it a result of a prosodic, lexical and/or syntactic focusing mechanism) may occupy different positions in the utterance and establishes a clearer paradigmatic relation with the alternative elements. When the alternatives are not explicitly formulated in the utterance, this relation is based on a conversational implicature both in the marked and in the unmarked focus (Kenesei 2005). In other words, an unmarked focus may have more than one alternative that can be contextually activated, whereas a marked focus necessarily evokes them[5]. Hence, an unmarked focus and a marked focus present two different types of information structures and could lead, as a result, to differentiated processing efforts. That is, if an utterance with an unmarked focus is potentially more ambiguous than the same utterance with a marked focus, and if focus particles encode semantic information and restrain the need to access a context to reconstruct the communicated assumption, it seems plausible that different cognitive strategies will come into effect during information retrieval.

---

[4] We follow the distinction between focus and scope as it is stated in König (1993: 979): "The focus of a particle can be defined as that string of expressions which is set off from the rest of the sentence by prosodic prominence and which is specifically affected semantically by the particle […] It is, however, not only the focus that the contribution made by particle to the meaning of a sentence depends on. Focus particles are also scope-bearing elements, so that their contribution to sentence meaning also depends on the scope they take within a sentence". However, in our experimental utterances, focus and scope are identical, since lack of coincidence of these elements could lead to interferences in the processing costs. This means that in our utterances *incluso* has always a narrow focus, i. e. the focus coincides in all cases with a single constituent that immediately follows the focus particle.

[5] Portolés (2010) makes a clear distinction between *focus*, using the term for contrast phenomena, and *rheme* or *new information*, which refers to the informative/unmarked focus. This distinction, however, is not widespread among other scholars, who clearly follow the three-level approach for information structure: 1. The structure theme/rheme; 2. The cognitive access to information (given/new); and 3. The focalization operation (background/focus information).

3 Focus particles: *incluso* ('even')

From a semantic point of view, focus particles have a paradigmatic dimension (Nølke 1983; Rooth 1985; Portolés 2007, 2009, 2010). They select an element belonging to a set or paradigm as the most relevant in a specific context. This selection may discard all the other elements, as it happens with restrictive focus particles (Spanish *solo* 'only'). Or it may just indicate that, for all the elements of the paradigm, the focused element presents the most relevant information in a certain context: focus particles like *incluso* ('even'), *también* ('also' or 'too') and *hasta* ('even') are all additive in a sense that they indicate that the information conveyed by the sentence is valid for all the elements of the paradigm, including the focused element.

The specific semantic value of *incluso* ('even') is its scalar meaning, i. e. the fact that it establishes some kind of order or scale among all the elements of the paradigm in which the focused element is presented as culminative. The scale can be based on semantic grounds, for instance in the case of elements indicating different degrees of the same quality as in (5):

(5) Según el día, mis hijos son pesados, pesadísimos o *incluso* insoportables

[Depending on the day, my kids are annoying, very annoying or *even* a pest]

Or it can be a pragmatic scale, i. e. a scale in which the elements are ordered in a way that reflects a specific state of affairs according to previous knowledge, as in (6) and (7):

(6) Alicia sabe sumar, restar, multiplicar, *incluso* dividir

[Alicia can add, subtract, multiply, *even* divide]

(7) David habla inglés, francés, italiano, *incluso* chino

[David speaks English, French, Italian, *even* Chinese]

In (6) and (7) the hearer/reader has to draw on his knowledge of the world in order to infer that certain languages and certain arithmetic operations are more difficult than others.

Focus particles can be considered discourse particles in a sense that they trigger and guide the inferences necessary to reconstruct the implicit meaning of the utterance (Blakemore 1992), a crucial operation for an accurate comprehension of the global meaning[6]. In the above-mentioned utterances, for instance, *incluso* stresses the most relevant (and unexpected) element within an ordered series of elements, which are conceived as belonging to the same paradigm. By default, the paradigm and the series are contextually determined, being specific for a particular communicative situation. The type of inference triggered by *incluso* can be considered as a conventional implicature (Grice 1967), since it cannot be cancelled.

(8) #María sabe *incluso* preparar soufflés, pero no sabe cocinar

[#María can *even* prepare soufflés, but she doesn't know how to cook]

[6] According to their semantic nature and to their function in text interpretation, focus particles can be considered a subtype of discourse particles (cf. Portolés 2007, 2010). In particular, they are claimed to have a metadiscursive function, because they provide instructions about the information structure of the utterance (López Serena/Borreguero 2010: 455–456).

4 Experiments on focus particles

Cognitive effort can be measured by means of an eye-tracker in terms of processing times (ms), so that different results can be interpreted as an indicator of different underlying processing patterns.

The basic eye-tracking measures are fixations, i. e. the moments in which "our eyes remain relatively still" on a stimulus (Rayner 1998: 373). Longer fixations are generally associated to a higher processing effort, as are regressions, that is, eye movements carried out backwards that serve to re-analyse stimuli that were not optimally processed during previous readings.

As stated earlier, our experiments aim to assess to what extent the processing of utterances (and of their main areas: alternative, focus particle and focus) varies if their focus is unmarked or marked, and whether the particle guides the reader towards the intentionally communicated assumption (i. e. towards an effective comprehension of the implicatures).

Furthermore, the role of the discourse particle as a processing guide is assessed in utterances that contain pragmatic scales for which the ordering of the elements is more arbitrary in one case (languages) than in the other (arithmetic operations)[7].

4.1 Design

The experiment had a 2x3 design with repeated measures on the factor of the alternative. This experiment was designed as a pilot study where the participants read two critical items in each condition. The experimental items were interspersed with filler items (ratio 1:2) to prevent readers from ascertaining the aim of the experiment. Nine critical items and 18 filler items were presented to the participants in a randomized order to avoid systematic order effects.

Word length effects were controlled in the critical utterances by weighting processing times for every area of interest. As a result, processing times are given in milliseconds needed to process a seven-character-word.

4.2 Independent variables

The interaction between two independent variables was analysed: on the one hand, the form of the alternative, either implicit, explicit exhaustive and explicit non-exhaustive; and, on the other hand, the presence of a marked or an unmarked focus. Combinations of these variables lead to following experimental utterances:

a) Presence vs. absence of a focus particle in utterances with implicit alternative information as in (9, 11) vs. (10, 12). Here, special attention is paid to the analysis of how the utterance processing changes when an unmarked focus is transformed into a contrastive focus by means of the focus particle:

(9) Alicia sabe dividir

(10) Alicia sabe *incluso* dividir

[7] Both scales are pragmatic scales and were considered so throughout the experiment. However, there is a difference between them regarding the number of possible elements that may constitute these scales. In the case of the arithmetic operations, the number is in principle lower than the number of elements that may integrate the languages scale.

(11) David habla chino (12) David habla *incluso* chino

b) Presence vs. absence of a focus particle in utterances with incomplete alternative information as in (13, 15) vs. (14, 16). The alternative is explicit, albeit not exhaustive:

(13) Alicia sabe multiplicar y dividir (14) Alicia sabe multiplicar, *incluso* dividir

(15) David habla inglés y chino (16) David habla inglés, *incluso* chino

c) Presence vs. absence of a focus particle in utterances with explicit exhaustive alternative information, as in (17, 19) vs. (18, 20), in which the three arithmetic operations/languages are arranged according to a pragmatic scale and the focused element merely completes the scale:

(17) Alicia sabe sumar, restar, multiplicar y dividir (18) Alicia sabe sumar, restar, multiplicar, *incluso* dividir

(19) David habla inglés, francés, italiano y chino (20) David habla inglés, francés, italiano, *incluso* chino

4.3 Dependent variables

In order to measure processing efforts and to perform a descriptive and inferential statistical analysis, two eye-tracking parameters, the *first-pass dwell time* and the *second-pass dwell time*, were computed and treated as the dependent variables of the experiment. Those two dependent variables provide insight into differentiated processing levels. The *first-pass dwell time* is the sum of the duration of all fixations on a word (or on any of the three mentioned areas of interest) before the reader fixates another word or area of interest. It reflects how low-level cognitive processes are carried out (Duchowsky 2007: § 12)[8]. The *second-pass dwell time*, equivalent to the time needed to re-read an area of interest, is a specific indicator of high-level processing, which concerns information retrieval (cf. Hyönä et al. 2003).

4.4 Apparatus and procedure

The reading performance of 20 participants was registered with an *Eyelink II* eye-tracker. The experimental items were presented on a computer screen where three characters equaled 1° of visual angle. The participants sat approximately 70 cm away from the monitor and the viewing was binocular, although just the stronger eye[9] was recorded by the eye-tracker. The experiment was recorded with a temporal resolution of 500 Hz.

Participants were given the instructions for the experiment, after which their vision was calibrated. Once the eye-tracker was calibrated correctly, the participants started with the experiment. The items were read silently and were presented on the upper left side of the

8 I. e. the costs of discriminating and decoding graphic stimuli to determine that the stimuli read are indeed words; confirming that these lexical elements are part of the mental lexicon (here, of the Spanish language); recognizing the word class, the argumentative structure and the syntagmatic information of the utterance, as well as the costs to integrate each lexical item in the sentence and of the syntactic-semantic adjustment.

9 Before starting the experiment, the stronger eye was detected by means of a short test.

screen. Reading was self paced. Participants had a short break after each third of the experiment, also needed to recalibrate the eye-tracker. After concluding the experiment, participants were informed of the purpose of the study.

Before the actual reading task, a first slide provided the reader with a context acting as background information for the experiment. The 20 participants were introduced to six-year-old Alicia, an excellent student who had won a basic arithmetic contest, showing her skills in doing three arithmetic operations (addition, subtraction and multiplication). These three operations are the background or given information. Hence, in the utterances (9) (13) and (17) *dividir* ('divide') constitutes the new information and its position at the end of the utterance helps to interpret it as an unmarked focus[10]. However, it turns into a marked or contrastive focus when it is preceded by a focus particle, as in (10), (14) and (18).

In order to obtain further data on the behaviour of discourse particles, a second set of experimental items with the same conditions (marked / unmarked focus within pragmatic scales) was developed and shown to the participants. Participants were introduced to David, a young Spanish teacher who enjoys learning languages and speaks fluent English, Italian and French. Similarly to the set of arithmetic operations, now those three languages constitute the background information. Therefore, in (11), (15) and (19), *chino* ('Chinese') is introduced as new information, its final position favouring its interpretation as an unmarked focus. In contrast, when preceded by *incluso*, *chino* constitutes the contrastive focus, as in (12), (16) and (20).

4.5 Participants

An eye-tracking experiment was conducted with 20 Spanish native speakers (age range 20–40) with a high level of instruction (University degree). All participants presented normal visual accuracy and were not aware of the purpose of the experiment.

5 Results: *first-pass dwell time*

5.1 Marked focus vs. unmarked focus without explicit alternative

First-pass reading data obtained for the utterances (11) and (12) show that the values for the focus (*chino*) are not significantly different from the values obtained for *incluso* ([$F(1.66) = 1.89$, $p = .17$])[11]. As a result, it can be argued that both elements act as a processing unit that coincides with the underlying syntactic unit formed by the focus operator and its focus. The data obtained for the marked and the unmarked focus under these conditions are not significantly different either [$F(1.61) < 0.01$, $p = .99$]:

10 We remind the reader that there is no possible ambiguity about the fact that dividir is the unmarked focus in these utterances, even if there is no explicit focus marking, because it is the only new information provided by the utterance. The fact that Alice can add, subtract and multiply is part of the information offered at the beginning of the experiment, before subjects begin to read the utterances displayed on the screen.

11 Only processing times concerning the functional areas for the focalization operation (i. e. alternative, focus particle and focus) are given and drawn to comparison.

David habla chino			
means [ms]	alternative	focus particle	focus
			409.15
David habla incluso chino			
means [ms]	alternative	focus particle	focus
		307.24	409.88
ANOVA	alternative/particle	particle/focus	focus/alternative
		[F(1.66) = 1.89, p = .17]	
David habla chino/David habla incluso chino			
ANOVA	alternative/alternative	particle/particle	focus/focus
			[F(1.61) < 0.01, p = .99]

Table 1: First-pass dwell time.

Similar data were obtained for (9) and (10):

Alicia sabe dividir			
means [ms]	alternative	focus particle	focus
			431.88
Alicia sabe incluso divider			
means [ms]	alternative	focus particle	focus
		262.33	370.30
ANOVA	alternative/particle	particle/focus	focus/alternative
		[F(1.67) = 3.31, p = .07]	
Alicia sabe dividir/Alicia sabe incluso dividir			
ANOVA	alternative/alternative	particle/particle	focus/focus
			[F(1.65) = 0.50, p = .47]

Table 2: First-pass dwell time.

Results obtained during the first-pass dwell time for utterances both with unmarked and marked focus and with the two pragmatic scales (the arithmetic operations one and the languages one) are "similar" in that no significant difference was found between them. The comparison (see the tables above) is based on different criteria and therefore refers to different problems: the first result compares fixation on focus vs. fixation on particle (a "syntagmatic" comparison between different elements in the same utterance); the second compares fixation on marked vs. unmarked focus (a "paradigmatic" comparison between two alternative utterances). There are no statistically significant differences neither in the

syntagmatic nor in the paradigmatic perspective. That means that the syntactic integration of a marked focus (as O) in a SVO structure does not demand higher costs than the ones necessary to integrate new information in the same type of structure. On the contrary, as we will see (§ 5.1), there are significant differences in the second pass. This can be interpreted as follows: different types of focus seem to demand different processing efforts when it becomes necessary to recalculate o reconstruct the information dimension of the utterance. This will reinforce the hypothesis that utterances are ostensively communicated stimuli which do not offer a complete representation of a state of affairs, but a semantically underspecified scheme which *allows* (= guides) the hearer/reader to reconstruct the conveyed information and which *determines* such reconstruction.

5. 2 Presence vs. absence of a focus particle in an utterance with an explicit non-exhaustive alternative

In (15) and (13) (table 3), the processing costs for the foci (*chino/dividir*) are significantly higher than those of the element that could function as the alternative (or contrast element) of the utterance (*inglés/multiplicar*).

Of course, it cannot be discarded that the position of the object at the end of the utterance leads to the obtained values, since the communicated assumption itself is reconstructed, precisely, from left to right, thus accumulating effort as the semantic, syntantic and an incipient information structure emerges:

David habla inglés y chino			
means [ms]	alternative 262.85	focus particle	focus 467.04
ANOVA	alternative/particle	particle/focus	focus/alternative [F(1.65) = 8.93, p < .01]
Alicia sabe multiplicar y dividir			
means [ms]	alternative 146.33	focus particle	focus 502.79
ANOVA	alternative/particle	particle/focus	focus/alternative [F(1.70) = 20.20, p < .01]

Table 3: First-pass dwell time.

If we consider the utterances with marked foci, no significant processing differences at all arise between the focus particle and the focus, whereas the difference between those two areas, on the one hand, and the alternative, on the other, are significant:

David habla inglés, incluso chino			
means [ms]	alternative	focus particle	focus
	221.98	358.05	442.18
ANOVA	alternative/particle	particle/focus	focus/alternative
	[F(1.72) = 11.61, p < .01]	[F(1.60) = 0.98, p = .32]	[F(1.60) = 8.77, p < .01]
Alicia sabe multiplicar, incluso dividir			
means [ms]	alternative	focus particle	focus
	133.54	416.63	304.26
ANOVA	alternative/particle	particle/focus	focus/alternative
	[F(1.75) = 28.10, p < .01]	[F(1.67) = 1.77, p = .18]	[F(1.68) = 7.79, p < .01]

Table 4: First-pass dwell time.

This means that processing costs increase significantly from the focus particle onwards, and that the focus particle and the focus seem to build a unit during the initial construction of the syntactic and information structure. Nevertheless, if the relative effort required to processing the focalization structures with a marked and an unmarked focus is compared, no significant differences can be seen for alternative and focus:

David habla inglés y chino/David habla inglés, incluso chino			
ANOVA	alternative/alternative	particle/particle	focus/focus
	[F(1.72) = 1.74, p = .19]		[F(1.53) = 0.05, p = .82]
Alicia sabe multiplicar y dividir/Alicia sabe multiplicar, incluso dividir			
ANOVA	alternative/alternative	particle/particle	focus/focus
	[F(1.76) = 0.68, p = .41]		[F(1.62) = 3.28, p = .07]

Table 5: First-pass dwell time.

5.3 Presence vs. absence of a focus particle in an utterance with an explicit, exhaustive alternative

Finally, if we consider utterances with a lexical enchainment, data show a similar behaviour to the utterances considered previously. For utterances with an unmarked focus, the focus (*chino/dividir*) has, again, significantly higher processing costs than the alternative:

David habla inglés, francés, italiano y chino			
means [ms]	alternative	focus particle	focus
	235.96		420.00
ANOVA	alternative/particle	particle/focus	focus/alternative
			[F(1.66) = 13.65, p < .01]
Alicia sabe sumar, restar, multiplicar y dividir			
means [ms]	alternative	focus particle	focus
	241.32		407.09
ANOVA	alternative/particle	particle/focus	focus/alternative
			[F(1.71) = 16.97, p < .01]

Table 6: First-pass dwell time.

In contrast, for utterances with a marked focus, no significant processing differences are obtained when the focus particle and the focus are compared, again in line with the results obtained for the utterances before. A significant difference is registered, however, if the data for the alternative are compared to those for the focus particle and the focus. Processing the alternative is significantly less costly:

David habla inglés, francés, italiano incluso chino			
means [ms]	alternative	focus particle	focus
	246.83	333.23	326.61
ANOVA	alternative/particle	particle/focus	focus/alternative
	[F(1.77) = 7.80, p < .01]	[F(1.68) = 0.02, p = .87]	[F(1.69) = 6.56, p = .01]
Alicia sabe sumar, restar, multiplicar, incluso dividir			
means [ms]	alternative	focus particle	focus
	231.20	330.63	370.00
ANOVA	alternative/particle	particle/focus	focus/alternative
	[F(1.74) = 9.06, p < .01]	[F(1.68) = 0.34, p = .55]	[F(1.68) = 5.41, p = .02]

Table 7: First-pass dwell time.

In summary, the focus particle constantly presents higher processing costs than the alternative, when the latter is explicitly given. As a conclusion, it can be argued that there is a "before-and-after" as to *incluso*, concerning the cognitive effort needed to process the semantics and syntax of an utterance. Up to *incluso,* processing efforts are relatively low. However, a qualitative leap occurs once the reader reaches the focus particle area. Processing

costs for the focus stay relatively similar to those for the focus particle, and no statistical processing differences were registered between both areas.

In the light of the reading data obtained for the first-pass dwell time, we can claim for a dependency between the processing of *incluso* and its scope/its focus. Contrarily, there are significant processing differences between focus and focus particle with regard to the alternative. We attribute this behaviour to the construction of the syntactic and semantic structure, and to the delimitation of the scope.

Again, a comparison of the relative efforts needed to process structures with a marked and an unmarked focus does not lead to significant differences:

David habla inglés y chino/David habla inglés, incluso chino			
ANOVA	alternative/alternative [F(1.75) = 0.35, p = .55]	particle/particle	focus/focus [F(1.60) = 2.35, p = .13]
Alicia sabe sumar, restar, multiplicar y dividir/Alicia sabe sumar, restar, multiplicar, incluso dividir			
ANOVA	alternative/alternative [F(1.74) = 0.21, p = .64]	particle/particle	focus/focus [F(1.65) = 0.26, p = .60]

Table 8: First-pass dwell time.

In this sense, no significant data were obtained for the first-pass reading in any of the conditions considered for utterances with marked and unmarked foci. In our opinion, this means that the higher information load of a marked focus does not correlate with higher processing costs during the syntactic and semantic structuring.

6 Results: *second-pass dwell time*

6.1 Marked focus vs. unmarked focus without explicit alternative

By observing processing patterns in (9) and (11) we see that an unmarked focus is a focus that is not explicitly signaled as such. Reprocessing an unmarked focus does not require a higher cognitive effort than processing other words in the utterance on average[12]: the cost for re-processing the unmarked focus *chino* in (11) (261.98 ms) is not significantly lower than the average processing time for the words in that same utterance (443.61 ms): [F(1.70) = 2.37, p = .12]. Similarly, in (9) the unmarked focus does not represent an area of high processing costs when it comes to the reconstruction of information, since the processing times of the focus (391.63 ms) are not significantly different than the processing times of an average utterance word (491.44 ms), [F(1.72) = 0.43, p = .51].

12 The differences between the reprocessing costs of the unmarked foci chino in David habla chino (261.98 ms) and dividir in Alicia sabe dividir (391.63 ms) are not significant from a statistical point of view: [F(1.66) = 0.73, p = .39]. Likewise, the processing costs of a single word between both utterances (in Alicia sabe dividir 491.44 ms, and in David habla chino 443.61 ms) do not differ significantly: [F(1.80) = 0.16, p = .68]. In summary, the recovery of the communicated assumption seems to follow the same pattern in both scales.

Generally, in utterances like those, in which the information structure is only marked "by default", information seems to be retrieved from areas other than the focus, whose processing, in turn, does not differ significantly. A plausible theoretical explanation for this could be that an unmarked information structure does not provide with any instruction or conventional mark to point out areas that are more important than others for the reconstruction of the communicated assumption. A further interpretation could be that no contrastive effects of paradigmatic nature have taken place.

The contrastive focus *chino* ('Chinese') in (12) requires significantly lower processing efforts (322.45 ms) than the focus particle (830.21 ms): [$F(1.66) = 13.97$, $p < .01$]. The processing costs associated with the discourse particle *incluso* are 157.47% higher than those for the marked focus. Thus, it seems that the focus particle highlights *chino* as a focus, and guides the information of the communicated assumption, while, at the same time, conventionally establishing its boundaries. This first finding, which relates to the high reprocessing costs of the focus particle compared to the focus, could allow for arguing that the focus particle has a sort of 'transitive function' (i. e. a procedural meaning), by which it determines the informative dimension of the focus and acts as a guide for the hearer to establish a contrast between a marked element and its alternative (not overtly expressed in this case). When *incluso* introduces a pragmatic scale in which the basic arithmetic operations are ordered as in (10), similar results are obtained. The focus (371.52 ms) shows a statistically significant difference [$F(1.67) = 6.42$, $p = .01$]) with respect to the focus particle (748.56 ms) during the reconstruction of the information structure: the reprocessing efforts at *incluso* are 81.34% higher than at the marked focus *dividir*.

Considering data from both utterances (lower reprocessing effort of the marked focus compared to other areas of the utterance), it could be argued that they contradict the proper notion of 'focus' as the most informative element of the utterance, regardless of whether it is a contrastive focus or new information. These data, however, can be interpreted in a different way. In SVO-structures with a focused object, once the semantic and syntactic information is understood during the first-pass (essentially low-level processes), the reader leaves the focus area during the second-pass to extract the necessary information to reanalyse the communicated assumption: the gaze leaves the focus and shifts to other areas where the information extraction can be completed. As a result, the processing effort of the focus does not increase during the successive re-readings, in contrast to the re-reading of the discourse particle, which is, after all, the device that signals the scalar information structure conventionally.

The additive focus particle enables and determines the reconstruction of the communicated assumption. The access to this 'instruction' implies a very high processing effort in comparison to the other words of the utterance, all of which have a fundamentally representational meaning[13]. High processing costs at the discourse particle bring out two effects:

- a 'lateral' effect, in the sense that *incluso* is the axis of the retrieval of the information structure, since it constrains the effort needed to reprocess the focus,

[13] Except for 'Alicia/David', since proper names are not "class names" (*nombres de clase*, Coseriu 1973: 268).

which is lower than both for the utterance average word and for the focus particle[14]: reprocessing the marked focus in *David habla incluso chino* is not significantly more costly than reprocessing the unmarked focus in *David habla chino* ([F(1.61) < 0.29, p = .58]). The same applies to *dividir* in *Alicia sabe incluso dividir* vs. *Alicia sabe dividir* ([F(1.65) = 0.01, p = .88]).

- and a 'global' effect, which can be observed in the utterance as a whole: the reprocessing effort of one utterance word with an unmarked focus in *David habla chino* (443.61 ms) is not statistically significant compared to the effort registered in *David habla incluso chino,* with a conventionally marked focus (529.36 ms) ([F(1.78) = 0.75, p = .38]). Again, the same applies to *Alicia sabe dividir* and *Alicia sabe incluso dividir* ([F(1.78) < 0.01, p = .92].

The higher reprocessing effort of the focus particle reduces the average reprocessing values of an utterance with more codified information ((10) and (12)) to values similar to those of an utterance with less codified information, and, therefore, with a higher underdeterminancy ((9) and (11)). This means that the higher processing effort at the focus particle does not lead to an increased processing effort of the utterance as a whole, but to redistribution and optimization of cognitive efforts. As a result, more and less marked areas in the utterance arise during information reconstruction. In this type of structure, the focus particle acts, thus, as a 'regulatory' information unit[15].

6.2 Presence vs. absence of a focus particle in an utterance with an explicit non-exhaustive alternative

We will now focus on how processing changes when a non-exhaustive explicit alternative is inserted into the utterance and establishes a relation of addition with the focused element.

In absence of a focus particle as in (15), *David habla inglés y chino*, the values for retrieving the informative role in the explicatures of both alternative (509.05 ms) and focus (473.20 ms) do not differ significantly ([F(1.67) = 0.19, p = .65]. In (13), *Alicia sabe multiplicar y dividir*, the information reconstruction follows the same pattern. Here, the reprocessing effort of the alternative is not significantly higher (424.59 ms) than that of the focus (199.59 ms, [F(1.70) = 3.54, p = .06]). This means that in both utterances information retrieval adjusts to a model without reliefs when there is no explicit instruction on how to relate the information of the alternative and the focus (the new information, *David habla chino* or *Alicia sabe multiplicar*, is merely added to the given information *David habla inglés*/*Alicia sabe dividir*), and, as a result, on how to restrict the inferences in the retrieval of the communicated

[14] For instance, during second-pass reading, *David habla incluso chino* significant differences were obtained between the processing times of the discourse particle (830.21 ms) and the average time needed to process the other words in the utterance (529,36 ms) [F(1.75) = 5.60, p = .02].

[15] The reprocessing effort of an open scale compared to a closed scale does not seem to be significantly different under these circumstances (without an explicit alternative). Comparing the reprocessing efforts of *Alicia sabe incluso dividir* and *David habla incluso chino,* no significant differences can be observed for either the contrast of the average processing effort of both utterances ([F(1.78) = 0.27, p = .60]), the area of the discourse particle ([F(1.71) = 0.23, p = .63]), or the area of the focus ([F(1.62) = 0.28, p = .59]).

assumption[16]. If every act of communication conveys the presumption of its optimal relevance, and if human communication tends to search for relevance optimization, it seems that stimuli like (13) and (15) are very underdetermined semantic templates which, in absence of a contextual enrichment (the context is restricted and controlled in our experiments), are not an optimal formula to trigger a scalar implicature.

The reprocessing efforts of both utterances do not differ significantly. That is to say, from a quantitative perspective, every area is reprocessed the same way. Qualitatively, however, differences can be seen between the retrieval of the information structure in (13), whose informative focus and the shared information are part of a relatively closed pragmatic scale, and in (15), in which the informative focus and the shared information are part of a potentially open pragmatic scale[17]. The processing effort for retrieving the open scale is higher both for the utterance as a whole ([$F(1.78) = 4.63$, $p = .03$]) and for the alternative ([$F(1.74) = 5.54$, $p = .02$]), but not the focus ([$F(1.63) = 3.08$, $p = .08$]). If none of the two utterances has a conventional guide that articulates the new and the given information, for the open pragmatic scale information must be integrated on the basis of a wider array of possible computations. Consequently, the reading process is less controllable, so that differences in reprocessing of different pragmatic scales can arise. Such divergences depend on whether the lexical stimulus and its encyclopaedic meaning suffice to activate scalarity without recurring to the context. Since the arithmetic operations scale forms a closer paradigm, lower processing costs are expected: the lexical value of *multiply* can be ordered more automatically to *divide*, than the lexical value of *Chinese* to *English*. In other words, these features can be an index of the fact that both scales are not fully identical, and that pragmatic scales should be ordered according to a continuum that moves from scales evoked directly by the discourse particle (for example, *Mary visited Cordoba, Malaga and even Seville*) up to maximally determined scales, very close to semantic scales with regard to their automatic processing.

16 The conjunction y ('and') is rather underdetermined and does not represent a relevant area for information reprocessing.

17 In these utterances, the arithmetic operations are ordered according to a pragmatic scale (our knowledge of the world tells us that dividing is more complex than multiplying) and according to an additive scale (the focused element (dividir) is added to the elements constituting the alternative). This is the difference between Alicia sabe incluso dividir and Alicia sabe solo dividir. The scale consisting of the basic arithmetic operations is a closed scale made up of four elements. It is also, to a great extent, a terminological scale (i. e. a nomenclature), since each scale constituent establishes equipollent oppositions in which the word follows the imperative delimitations of the world and not the other way around, as it happens in non-terminological vocabulary.

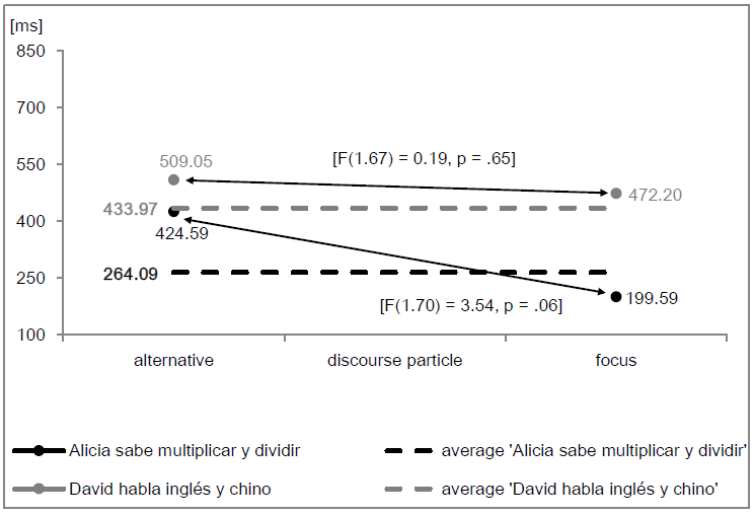

Figure 1: Second-pass dwell time.

We will now look closely at utterances with a marked focus. In (16) *David habla inglés, incluso chino* and in (14) *Alicia sabe multiplicar, incluso dividir* the marked foci *chino*/*dividir* require low processing efforts compared to the average processing time per utterance word ([F(1.69) = 13.91, p < .01] and [F(1.68) = 5.23, p = .02] respectively). In both cases, the effort to reprocess the focus is significantly lower than the effort needed to reprocess the focus particle and the alternative. Contrarily, no significant differences are registered between the focus particle and the alternative (figures 2 and 3).

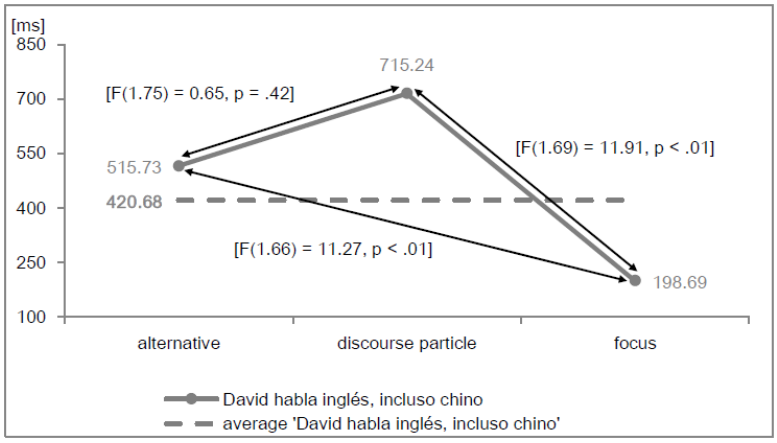

Figure 2: Second-pass dwell time.

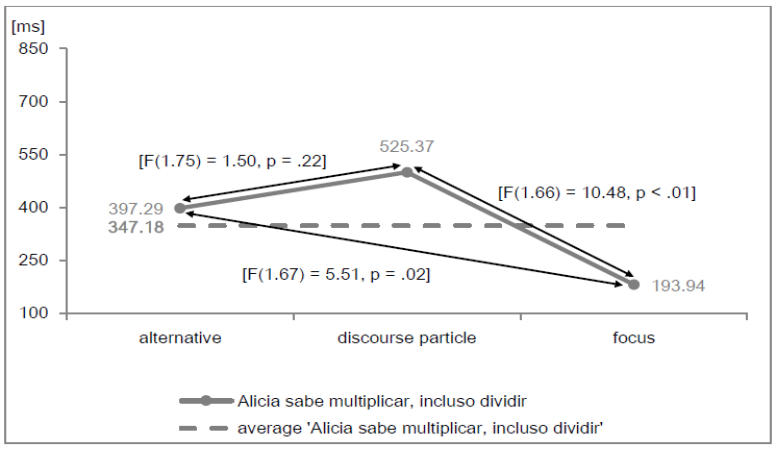

Figure 3: Second-pass dwell time.

The fact that, in both cases, the relative effort to process the alternative approaches significantly the costs of the focus particle means that both elements might form a sort of unit for information retrieval, when the information contained in the alternative and the focused information are compared. That the alternative and the focus particle require significantly higher processing efforts than the focus may suggest that, when information is retrieved to recover the communicated assumption, we part from the first-pass reading, which concludes in the focus, and, from there on, information is reconstructed by increasing the processing costs for the focus particle, which contains the instruction to articulate the phoric relation between the marked focus and the alternative.

When comparing (14) and (16), it emerges that neither the global nor the local processing costs (for each area of interest) show significant differences: [$F(1.78) = 0.76$, $p = .38$] for the utterance average word during information retrieval; [$F(1.74) = 0.88$, $p = .35$] for the average time needed to process the alternative; [$F(1.73) = 1.27$, $p = .26$] for average reprocessing of the focus particle; and [$F(1.54) < 0.01$, $p = .93$] for the average time for information retrieval within the focus. These results reveal an important fact: when a marked focus and its alternative are linked to reconstruct either an open or a closed scale, there is minimum room for variability, whereas when new and given information are articulated, there are actual possibilities for variability. In other words, the focus particle seems to homogenize processing strategies if no other conventional or semantic element to articulate information is given.

If (15) and (16) are compared, the foci differ significantly ([$F(1.61) = 5.45$, $p = .02$]). The unmarked focus requires longer processing times than the marked focus (473.20 ms vs. 198.69 ms). In contrast, neither the alternatives ($p = 0.59$) nor the average time needed to process an utterance average word ($p = 0.97$) do so. In the light of these data, the focus particle seems to regulate and facilitate the retrieval of a higher load of information – the scalar implicature – without, nevertheless, leading to higher processing efforts in relation to those required to process an utterance like (15), in which the focus is not marked and which therefore encapsulates a less dense assumption as far as information load is concerned. This behaviour is similar to the processing patterns obtained for the contrast (14) *Alicia sabe multiplicar, incluso dividir* and (13) *Alicia sabe multiplicar y dividir*. That shows that, for the utterance as a whole, inserting a discourse particle does not lead to higher processing costs, but redistributes them.

6.3 Presence vs. absence of a focus particle in an utterance with an explicit, exhaustive alternative

As far as information structure is concerned, in (20) *David habla inglés, francés, italiano, incluso chino* the marked focus *chino* is presented as the less expectable element in the explicit paradigm *inglés, francés, italiano*. On the other hand, in (19) *David habla inglés, francés, italiano y chino*, the informative focus *chino* is marked by default – merely by its position – as the most informative element of the uttered chain. The latter focus corresponds exclusively to the word *chino*, since participants had been previously given information about David being able to speak three languages (English, French and Italian), which constitutes the informative background (or the given information) of the utterance. Within (20), *incluso* transforms the informative focus into a marked focus that becomes part of a lexical instruction, thus guiding the processing of the utterance information. This applies to (18)

Alicia sabe sumar, restar, multiplicar, incluso dividir and (17) *Alicia sabe sumar, restar, multiplicar y dividir* as well, with a relatively closed pragmatic scale.

In utterances that contain an unmarked focus, processing the foci is not significantly more costly than processing the alternatives. ANOVA data obtained for (19) do not show significant differences [F(1.66) = 0.75, p = .38], nor do they for (17) [F(1.71) = 2.35, p = .12]. Again, the reprocessing pattern is flat, as we saw before in utterances with no alternative, or with an explicit non-exhaustive alternative.

In contrast, when the focus is marked by *incluso*, the reconstruction of the information structure varies. In (20) the differences between the time needed to process the alternative (360.57 ms) and the focus particle (500.92 ms) are not significant ([F(1.76) = 1.67, p = .19]); nor are they when comparing reprocessing times for alternative and focus (228.15 ms, [F(1.69) = 1.74, p = .19]). Contrarily, significant differences arise between the average time needed to reprocess the focus and the discourse particle (*incluso* showing significantly higher costs): [F(1.67) = 5.55, p = .02]. This means that the discourse particle plays a relatively costly role during reconstruction in relation to the focus, and that its role as a guide for articulating the pragmatic scale has not vanished completely compared to the previous conditions (implicit and explicit, non-exhaustive alternative), since it enables to reconstruct conventionally an open scale in which the relations between focus and alternative require choosing among further possible calculations.

If the hypothesis that (re)arranging an open scale as the one related to languages is more costly than (re)arranging a closed scale as the one related to arithmetic operations, we could expect that during the latter process, the role of the discourse particle becomes less prominent, since the lexical elements must be arranged parting from a narrower array of possible computations. Indeed, that is what happens with the scale of arithmetic operations. When (18) is reconstructed, the processing pattern is "flatter", or less uneven. None of the areas involved in the focusing operation (alternative, discourse particle and focus) show average processing costs per word significantly different from those obtained for the other areas of interest of the utterance:

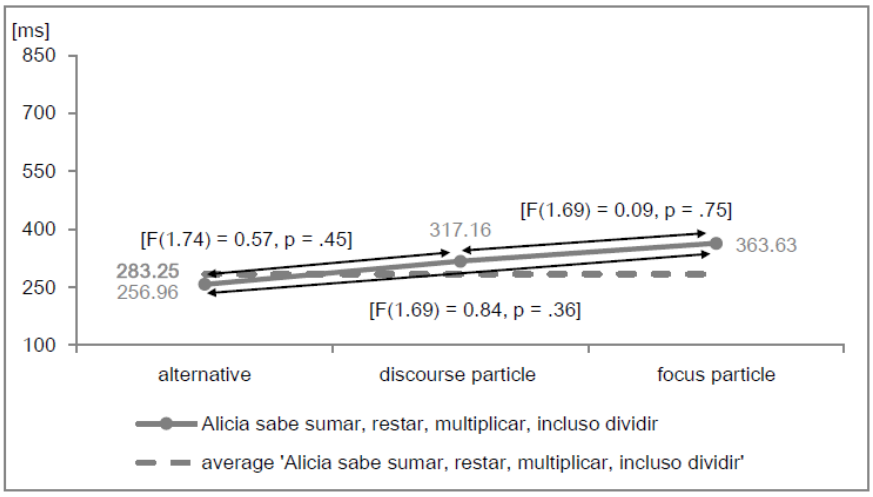

Figure 4: Second-pass dwell time.

When the utterance displays a high semantic saturation (that is to say, if the semantic template given by the language barely needs to be contextually enriched in order for the reader to be

able to build an assumption from which implicatures can be derived), information processing for all areas becomes simpler, and none of them requires to be actually reanalysed. In fact, the alternative introduces a lexical informative enchainment that is co-oriented to the instruction conveyed by the discourse particle from an argumentative perspective.

To sum up, in structures with closed scales utmostly determined from a semantic point of view, the role of the discourse particle as a guide for articulating the utterance information diminishes, since the particle is not anymore the only index that prompts the processing of a scalar structure. The lexical enchainment can act itself as a minimal ostensive stimulus for scalar processing. The statement 'it can act itself as a minimal ostensive stimulus' means specifically that the utterance processing costs are highly dependent on the representational meaning to be structured, and that, in such case, the role of the discourse particle varies in relation to the effort needed to arrange internally the elements of the scale. The presence of an explicit mark for the contrastive focus in these contexts only interacts with the conceptual information already given, and reduces the processing costs for the information structure up to values that are statistically similar to those obtained for the structure with an unmarked focus, in which no significant differences were registered with regard to the time needed to reanalyse the functional areas involved in the focusing operation.

Comparing the utterances with a closed pragmatic scale with a marked and an unmarked focus ((17) vs. (18)), no significant differences are observed for their reprocessing, neither between the utterance average words ([$F(1.78) = 6.08$, $p = .99$]), nor between the alternatives ([$F(1.74) = 0.83$, $p = .36$]) or the foci ([$F(1.66) = 2.20$, $p = .14$]). No statistically significant differences in the reprocessing of the discourse particle in comparison to the average reprocessing costs of one word of the utterance could be found either ([$F(1.78) < 0.01$, $p = .99$]). That is to say, lexical processing reduces the impact of the discourse particle and, consequently, processing times of an utterance with a higher load of conventional information like (18) fall back to the levels of those registered for an utterance with less conventional information like (17).

However, when the scale is open ((19) and (20)), the average processing costs of an utterance with a marked focus (368.23 ms) are significantly higher ([$F(1.78) = 4.08$, $p = .04$]) than those of an utterance with an informative focus (229.60 ms): again, we observe that in the reconstruction of a more 'open' scale from a computational point of view, the processing costs of the discourse particle have a greater impact on the utterance processing. In fact, they increase the global costs, since this conventionally marked scale triggers a pragmatic set of alternatives that is conditioned by world knowledge to a greater extent than in the case of arithmetic operations.

7 Conclusions

An experimental analysis of the behaviour of the Spanish additive focus particle *incluso* ('even') during the reconstruction of information structure suggests that the focus particle determines information retrieval patterns. Under the circumstances considered, focus particles facilitate information retrieval and redistribution by distinguishing areas that are informatively more prominent than others.

During first-pass reading, the additive focus particle *incluso* shows similar processing costs to those obtained for its focus, and significantly higher costs than the alternative. Hence, particle and focus seem to build a structural unit differentiated from the alternative (if explicit). However, the processing differences associated to these two areas do not imply that the comparison of structures with a marked and an unmarked focus throw significant differences as well, under our experimental conditions.

The unit formed by the focus particle and the focus contrasts with the unit that arises during the reconstruction of the communicated assumption in the second pass. In second-pass readings, the unit consists of the focus particle and the alternative (if given). In utterances with a marked focus, the focus particle guides information retrieval. In that process, the lexical alternative acts a linguistic cue for setting up the contrast between the information contained in it and that coded in the focus, since the discourse particle contains the instruction of establishing the phoric articulation between the focus and its set of alternatives.

Processing the focus particles is significantly more costly than processing the focus. The effect of the particle on the utterance as a whole favours that processing efforts are not significantly higher than processing an utterance with an unmarked focus. In other words, the focus particle conventionally allows for more information – the scalar implicature – to be recovered, but without apparently leading to relatively higher processing costs than those for an utterance with an informative focus. As a guide for inferential computations, the discourse particle rather minimizes and redistributes processing costs assigning more prominence to certain areas.

In the light of our experimental data, it can be claimed that the focus particle *incluso* is interpreted as 'an instruction' during second-pass readings. It acts as a cue that determines the processing of the elements within its focus. The processing costs of the discourse particle are higher than the processing efforts of its focus, unless there is a lexical enchainment that determines to a higher extent the reconstruction of the communicated assumption. The processing costs of discourse particles accounts not only for their own decoding, but also of how they contribute to the processing of other elements in the utterance: their meaning is mainly procedural.

Also according to our data, the hypothesis that the marked and the unmarked focus lead to a differentiated cognitive behaviour as to the retrieval of the information structure seems to be confirmed. In the utterances with an unmarked focus, the absence of a conventional instruction (a focus particle) leads to a lack of particularly highlighted areas. From a theoretical perspective, an explanation for this could be the underdetermined semantic information generated by the copulative conjunction *y* ('and'), which links the given and the new information.

In utterances with a marked focus, the processing costs of information retrieval do not necessarily increase, even though more information (a contrast relation) is activated. The focus particle regulates the informative reorganization of the utterance, though generally not leading to increased processing costs for the whole utterance compared to utterances in which the focus merely provides new information.

References

Andorno, Cecilia (2000): *Focalizzatori fra connessione e messa a fuoco. Il punto di vista delle varietà di apprendimento*. Milano: FrancoAngeli.

Blakemore, Diane (1987): *Semantic constraints on relevance*. Oxford: Blackwell.

Blakemore, Diane (1992): *Understanding utterances*. Oxford: Blackwell.

Blakemore, Diane (1997): "Non-truth conditional meaning". *Linguistische Berichte* 8: 92–102.

Carston, Robyn (2002): *Thoughts and Utterances: the Pragmatics of Explicit Communication.* Oxford: Blackwell.

Carston, Robyn (2004): "Relevance theory and the saying & implicating distinction". In: Horn, Laurence/Ward, Gregory: *The Handbook of Pragmatics*. Oxford, Blackwell: 633–656.

Coseriu, Eugenio (1973): *Teoría del lenguaje y lingüística general*. Madrid: Gredos.

Dik, Simon (1989): *The Theory of Functional Grammar. Part I*. Berlin/New York: de Gruyter.

Duchowski, Andrew (2007): *Eye Tracking Methodology. Theory and Practice*. London: Springer.

Grice, H. Paul (1967): "Logic and Conversation". In: Cole, Peter/Morgan, Jerry L. (eds.) (1975): *Syntax and Semantics*. Vol. 3: *Speech Acts*. New York, Academic Press: 41–58.

Gundel, Jeanette K. (1999): "On different kinds of focus". In: Bosch, Peter (ed.): *Focus: Linguistic, cognitive, and computational perspectives*. Cambridge, Cambridge University Press: 293–305.

Hyönä, Jukka/Lorch, Robert/Rinck, Mike (2003): "Eye Movement Measures to study global text processing". In: Hyönä, Jukka/Radach, Ralph/ Deubel, Heiner (eds.): *The mind's eye: cognitive and applied aspects of eye movement research*. Amsterdam, Elsevier: 313–334.

Jackendoff, Ray (1972): *Semantic interpretation in generative grammar*. Cambridge: MIT press.

Kenesei, István (2005): "Focus and Identification". In: Molnár, Valéria/Winkler, Susanne (eds.): *The architecture of focus*. Berlin, de Gruyter: 137–168.

Kiss, Katalin E. (1998): "Identificational focus versus information focus". *Language* 74/2: 245–273.

König, Ekkehard (1991): *The meaning of focus particles: a comparative perspective.* London: Routledge.

König, Ekkehard (1993): "Focus Particles". In: Jacobs, Joachim/von Stechow, Arnim/Sternefeld, Wolfgang/Vennemann, Theo (eds.): *Syntax: Ein internationales Handbuch*. Berlin, de Gruyter: 978–987.

López, Araceli/Borreguero, Margarita (2010): "Los marcadores discursivos y la variación lengua hablada *vs* lengua escrita". In: Loureda, Óscar/Acín, Esperanza (eds.): *Los estudios sobre marcadores del español, hoy*. Madrid, Arco/Libros: 325–405.

Murillo, Silvia (2010): "Los marcadores y su semántica". In: Loureda, Óscar/Acín, Esperanza (eds.): *Los estudios sobre marcadores del español, hoy*. Madrid, Arco/Libros: 241–280.

Nølke, Henning (1983): *Les adverbes paradigmatisants: fonction et analyse*. Copenhagen: Akademisk Forlag. (= *Revue romane* 23).

Portolés, José (2001 [1998]): *Marcadores del discurso*. Barcelona: Ariel.

Portolés, José (2004): *Pragmática para hispanistas*. Madrid: Síntesis.

Portolés, José (2007): "Escalas aditivas. Pruebas del español". *Spanish in Context* 4/2: 135–157.

Portolés, José (2009): "Alternativas convocadas por partículas discursivas". *Español Actual* 92: 47–68.

Portolés, José (2010): "Los marcadores del discurso y la estructura informativa". In: Loureda, Óscar/Acín, Esperanza (eds.): *Los estudios sobre marcadores del español, hoy*. Madrid, Arco/Libros: 281–325.

Rayner, Keith (1998): "Eye Movements in Reading and Information Processing: 20 Years of Research". *Psychological Bulletin* 124/3: 372–422.

Recanati, François (2002): "Unarticulated constituents". *Linguistics and Philosophy* 25/3: 299–345.

Richardson, Daniel/Dale, Rick/Spivey, Michael (2007): "Eye movements in language and cognition: A brief introduction". In: Gonzalez-Marquez, Monica (ed.): *Methods in Cognitive Linguistics*. Amsterdam/Philadelphia, John Benjamins: 323–345. (= *Human Cognitive Processing* 18).

Roberts, Craige (1998): "Focus, the flow of information and universal grammar". In: Culicover, Peter/McNally, Louise (eds.) (1998): *Syntax and Semantics*: *the limits of syntax*. London, Academic Press: 109–160.

Rooth, Mats (1985): *Association with Focus*. Doctoral Thesis, University of Massachusetts at Amherst.

Sperber, Dan/Wilson, Deirdre (1995): *Relevance*. Oxford: Blackwell.

Sperber, Dan/Wilson, Deirdre (2002): "Pragmatics, Modularity, and Mind-reading". *Mind and Language* 17: 3–23.

Schwenter, Scott A. (1999): *Pragmatics of Conditional Marking: Implicature, Scalarity, and Exclusivity*. New York: Garland.

Taglicht, Josef (1994): "Syntactic structure and intonational phrasing". *Penn Working Papers in Linguistics* 1/1994: 129–141.

Trager, George L./Smith, Henry L. (1951): *An outline of English structure*. Norman: Buttenburg Press. (= *Studies in Linguistics. Occasional Papers* 3).

Van Kuppevelt, Jan (1996): "Inferring from topics". *Linguistics and philosophy* 19/4: 393–443.

Wilson, Deirdre (2003): "New directions for research on pragmatics and modularity". *UCL Working Papers in Linguistics* 15: 303–324.

Wilson, Deirdre/Sperber, Dan (2002): "Pragmatics, Modularity and Mind-reading". *Mind and Language* 17: 3–23.

Zubizarreta, Maria Luisa (1999): "Las funciones informativas: tema y foco". In: Bosque, Ignacio/Demonte, Violeta (eds.): *Gramática descriptiva de la lengua española*. Madrid, Espasa Calpe: 4215–4244.