



Comprehension strategies while reading expository texts in Spanish (L1) and English (L2)

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ABSTRACT

The ability to comprehend written texts is essential in order to gain access to the vast amount of written information available today. This is especially true for university students who, in the context of their studies, often need to search for and use information in English. However, it is also the case that the English proficiency level of many students renders this task a laborious and frustrating experience. The starting point of this research was the consideration that without knowledge of how students go about processing texts, it would be difficult to design effective instruction in reading strategies that would meet their academic and professional needs. This study describes the use and awareness of comprehension strategies by a small group of students who were asked to report on what they did to understand while carrying out information-transfer tasks based on expository texts in Spanish (L1) and in English (L2).

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Estrategias de comprensión mientras se leen textos expositivos

RESUMEN

Ser competente para comprender textos escritos es esencial para acceder a la inmensa cantidad de información escrita disponible actualmente. Esto es especialmente cierto en el caso de los estudiantes universitarios que, en el contexto de sus estudios, necesitan buscar y usar información escrita en inglés. Sin embargo, también es cierto que el nivel de inglés de muchos estudiantes convierte dicha tarea en una laboriosa y frustrante experiencia. Esta investigación parte de la consideración de que, sin saber cómo los estudiantes se enfrentan a los textos escritos, sería difícil diseñar una instrucción eficaz de las estrategias de lectura que satisfagan sus necesidades académicas y profesionales. El presente estudio describe el uso de las estrategias de comprensión de un grupo de estudiantes a los que se pidió informar sobre lo que hacían para comprender mientras completaban tareas de transferencia de información basadas en textos expositivos en español (L1) y en inglés (L2).

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There are numerous factors which can be taken into account when discussing reading comprehension; text genre, text topic, the purpose of reading and, hence, the reader's goals, language proficiency, domain knowledge of the reader, comprehension strategies, and many others. With respect to the last of these, although there is already a considerable literature on the subject of comprehension strategies, one area which has received less attention is that of second language (L2) reading and even more particularly in academic contexts with students of low L2 proficiency. Nevertheless, as Block (1986) argued, without some information about what

students bring to the reading process in terms of text-processing strategies, we can only guess at the problems or difficulties they may have and will not be able to design activities or study programmes that will meet their needs.

The research reported here aimed to find out what text processing operations students engaged in as they carried out tasks using first language (L1) texts and to see how this compared with how they handled similar tasks using L2 texts. The specific research questions explored were the following:

- 1) What comprehension strategies are used by the readers reading expository texts in L1 and L2 while carrying out information-transfer type tasks?
- 2) Are the comprehension strategies used by the readers when reading in their L1 similar or different to those used when reading in their L2?

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Comprehension strategies

For our purposes, the term 'comprehension strategies' refers to the resources employed by readers in their attempts to understand a text and construct meaning. Usually, readers are not aware of these processes and it is only when comprehension breaks down that a conscious effort may have to be made to understand. Another way to think of comprehension strategies is as the means employed by a reader to resolve a problem encountered while reading.

Clearly, a wide range of behaviours can be included under these general characterisations and over the years, a number of taxonomies of comprehension strategies have appeared in the literature (e.g., Block, 1996; Davies, 1995; Munby, 1978; Olshavsky, 1977; Sarig, 1987), to name a few. However, there seems to be little consensus concerning the terminology used or, indeed, what it is that is classified. Block (1986), for example, grouped strategic behaviour into two broad classes: general strategies and local strategies. Sarig (1987) identified four types of what she called reader 'moves', while Bernhardt (1991) referred to what she called 'elements' that caused the correct or incorrect construction of meaning of a text. Davies (1995) grouped strategies into five main categories, while Jiménez, García, & Pearson (1996) classified three main strategies. These latter could be text-initiated strategies (e.g., *using text structure, focusing on vocabulary*), reader-initiated strategies (e.g., *invoking prior knowledge*) or interactive strategies (e.g., *confirming, inferring*). Other researchers (such as, Hosenfeld, Arnold, Kirchofer, Laciura, & Wilson, 1981; Kletzien, 1991) have preferred to compile a list of observed or reported behaviours. Given so much choice, one is left wondering whose list to take and on what grounds.

Furthermore, despite the fact that think-aloud protocols (see below) are considered to be reasonably valid reflections of normal comprehension activities (Chi, de Leeuw, Chiu, & Lavancher, 1994; Ericsson & Simon, 1993; Trabasso & Magliano, 1996; Zwaan & Brown, 1996), and the widely accepted 'psychological validity' (Urquhart & Weir, 1998, p. 94) of this method of obtaining data, it is by no means perfect. For example, it is possible that the think aloud task itself may cause readers to increase the amount of attention and effort they expend on a text (Coté, Goldman & Saul, 1998; Kaakinen & Hyönä, 2005), and some participants are better at articulating their thought processes than others, or more willing to do so. It is also the case that the task of identifying the strategies used from the transcripts is not always straightforward and sometimes requires 'high inference' on the part of the researcher (Ellis, 1994) in order to interpret which strategy is being used and when.

A further problem is that the transcripts of the think-aloud protocols only reflect what subjects do when they do NOT understand, they do not indicate the processes readers engage in when understanding takes place. This is to be expected, of course. If comprehension has not broken down the process remains largely automatic, but it means that the think-aloud procedure does not always tap into unconscious comprehension processes (Graesser, Millis, & Zwaan, 1997). Nor do the transcripts show whether the students really have understood or not. When the participants (claim they) understand without a problem they merely say "I understand (*'Entiendo'*)" without explaining how.

One final point worth mentioning is that neither do we know what really happens when readers do understand. Participant #5; for example, is able to claim on a number of occasions that: "I've understood the sentence just by reading it", (*'He entendido la frase con solo leer'*), or "This point [...] I've understood it without having to do anything", (*'En este punto [...] Lo he entendido bien sin tener que hacer nada'*). Thus, reported strategy use could be influenced by participants' attitude to the activity; the amount of effort they are prepared to put into reporting, or the extent to which they are prepared to admit to having difficulties. A full discussion of these complications, however, although very interesting, is beyond the

scope of this paper. We will limit ourselves here to a description of the strategies that were identified.

Method

Participants

This was a small, preliminary study which used 7 second-year students (3 female, 4 male) from the School of Design Engineering at Valencia University of Technology (*Universitat Politècnica de València*). The students were studying Technical Industrial Engineering and specialising in either Chemical, Electronic or Mechanical Engineering. They were not selected or rewarded in any way but were those who volunteered to participate when the nature and purpose of the study was explained to them. Although they can be considered as representative of the overall student body in terms of their socio-economic background, educational achievement and English proficiency level, the small sample used means that caution should be exercised when generalising conclusions.

All the participants were native speakers of Spanish and Spanish was the language of instruction in their lectures and the language they used for coursework except in their foreign language classes. On average they had been studying English for seven and a half years. The Oxford Quick Placement Test (QPT) was administered to all participants prior to the reading sessions. Scores ranged from 15 to 31 giving an average of 22.4 which corresponds to level A2 on the Common European Framework of Reference (CEFR) for Languages Scale. This means that the average level of English of the participants was well below that required for academic study on tertiary level courses taught entirely in English.

Table 1 summarises the basic personal information for each participant. For purposes of reference and comparison, each is identified by a number, with #1 having the highest level of English proficiency and #7 the lowest. Columns 2, 3, 4 and 5 show, respectively, their age to the nearest full year, their gender, the number of years each student had already studied English, and their level on the CEFR scale as measured using the Oxford Quick Placement Test. For interest, column 6 shows the number of hours per week each student reported they spent reading material other than coursework in both Spanish (L1) and English (L2).

Table 1
Basic information of each participant

Student	Age (years)	Gender	Years studying English	CEFR level	Hours per week spent reading material unrelated to degree course	
					Spanish	English
#1	19	F	7	B2	4	0
#2	19	M	7	B1	3-4	0
#3	19	F	7	B1	4	0
#4	19	F	7	A2	5	0
#5	20	M	9	A2	2	0
#6	19	M	8	A2	13-15	0
#7	19	M	8	<A1	0	0

Choice of tasks and texts

In order to make the activity as authentic as possible, tasks and texts were required which (a) were typical of an academic environment, and (b) required the typical reading processes used in

that environment. Two types of information-transfer tasks were chosen. Each type of task was given to each participant twice, first in English, then in Spanish, so that altogether each subject carried out four tasks, twice in English and twice in Spanish. The first task in each language required the participants to take notes on specific topics contained within the texts. The second task required the participants to label diagrams using information contained in the texts. Table 2 shows the order and type of tasks.

Table 2
The order and type of task

Task	Task type	Language of the text
1	note-taking	English
2	labelling a diagram	English
3	note-taking	Spanish
4	labelling a diagram	Spanish

It was expected that the tasks would involve the participants in careful and expeditious reading at both global and local levels; that is, to understand the overall gist of the text as well as identify and extract relevant, specific details which could be straightforwardly expressed in linear note-form in short, two- or three-word phrases (without needing to be transformed into other written or numerical forms) or transferred directly to the diagrams in the labelling tasks.

Given that motivation is one of the factors influencing the processing of information, we wanted the text topics to be of interest to the students, to be relevant to their studies without being too subject-specific to any one specialisation (chemical, electrical or mechanical engineering) and also to be subject matter about which they could be expected to have similar levels of background knowledge. In addition to these considerations, the final choice of texts also took into account their length, linguistic difficulty, density of information, and the salience of information; that is, the suitability for the task with respect to identification and transferability of information. The two English language texts eventually decided on were taken from sites on the World Wide Web, while the Spanish texts were originally published in the online *Futuro* supplement of the newspaper *El País*. The titles of each text and the number of words are shown in Table 3.

Table 3
The texts used

Text	Text name	Nº. of words
1	Introduction to Materials Selection	953
2	Rosetta Spacecraft Design	699
3	Nuevos Ojos en el Espacio para la Primera Luz	1116
4	El Hallazgo de un Gran Objeto más allá de Plutón Replantea la Idea de Planeta	1187

For ease of administering the tasks and in order to maintain a uniform format between all four texts, a twelve-point Times New Roman font was used in a single column. In addition, hypertext links were removed so that the text was presented in uniformly black ink on a white background. Two short sections in Text 1 (*Introduction to Materials Selection*) were removed; they contained no important information from the point of view of task requirements and it was felt their inclusion would only add to the time required to complete the task. Finally, the beginning of the fifth line of each text was numbered in order to make referencing easier.

Given the low English language proficiency level of the participants, it could be argued that the English-language texts would be *a priori* inaccessible to them. However the choice seems

justified in that it is this sort of text (density of information, lexical range) which these students are expected to handle as part of their coursework and which they will need to deal with in the future. Moreover, the English and Spanish texts needed to have an equivalent level in terms of linguistic and informational demands.

Data collection

Two methods were used to obtain data in this study: think-aloud protocols and retrospective interviews.

Think-aloud protocols Because comprehension strategies cannot be observed directly, one way of gaining access to the thoughts of readers is to ask them to say what they are doing as they do it. The idea underlying this method of eliciting introspective data is that it provides direct access to the activities readers engage in as they process a text and shows what information is attended to, what operations are carried out, and what choices are made (Cohen, 1998; Ericsson & Simon, 1993). As Davies (1995) puts it:

Introspective methods are thus seen to have considerable potential for providing insights, rather than firm generalizations, into the knowledge sources and strategies readers use in different reading tasks Davies (1995, p.39).

In this study, participants were given a short training session, during which it was explained that they were required to read a text, sentence by sentence, and then verbalise as much as they could about what they were thinking as they read, and about what they did to understand, and to do this in whatever language (Spanish or English) they were thinking in at the time. Following Olshavsky (1977) and Block (1986) a red dot was inserted after each sentence to remind the readers to do this. Once the researcher and the reader were satisfied they were able to verbalise their thoughts adequately, they were given the task-instruction sheet for the first text. After making sure they understood what was required they were given the text and left alone. Their think-aloud protocols were recorded and later transcribed for analysis. Altogether a total of four texts+tasks (two in English, two in Spanish) were given to each subject, spread over a total of four sessions (1 text+task per session, with the exception of the first when the training text was also used). For each participant, Sessions 2, 3 and 4 followed the same pattern as Session 1, minus the training text.

Retrospective interviews. These interviews provided an opportunity to clarify or extend any issues arising from the transcriptions of the think-aloud protocols and to discuss with the subjects their own views on which processes and strategies they used in both L1 and L2 reading. They were rather loosely structured, although all began with the same general questions (How do you think the way you read in English differs from the way you read in Spanish?; Can you describe the sort of things you do when you don't understand parts of a text?). Subsequent questions were more focused on each individual's responses to these initial questions and to examining each subject's transcriptions and developing any issues or inconsistencies arising from them.

Classification of Strategies

The first point to clarify is that it was not our intention to formulate a complete list of strategies, but rather to identify the text-processing operations our students reported using while carrying out the reading tasks assigned them in this specific reading situation. Secondly, and given the difficulties outlined above, we should bear in mind that although we can take a particular transcript, count the different strategies used and the number of times each is reported as being used and conclude that in any given text+task, n number of strategies were employed and that of these $x\%$ were Strategy A, $y\%$

were Strategy B, z% were Strategy C and so on, these figures do not necessarily represent the complete picture. With different texts and different tasks the readers may have employed different strategies.

It is generally accepted that reading is an interactive process between the information contained in the text, the reader's knowledge and the context of the reading situation, and therefore one could suppose a 3-way classification of strategies according to these three general criteria. Such a scheme results in the following broad categories: Text-Based Strategies, Reader-Based Strategies, and Context-Based Strategies.

Another 3-way categorisation is obtained if strategies are classified according to what students do to understand the text; that is, what they do to establish meaning, what they do to control their reading, and what they do to complete a task. This would give Meaning-Based Strategies, Control-Based (or Metacognitive) Strategies, and Task-Based Strategies.

These three broad categories were adopted here. However, to call a strategy 'Meaning-Based' does not give much indication of the purpose behind strategy use other than to derive meaning from the text, which seems too general to be useful. We preferred, therefore, to further classify those strategies which are used to derive meaning at a local or global level on the basis of more specific functions. The broad category of Meaning-Based Strategies was therefore subdivided into 5 further sub-categories or classes.

Nevertheless, whatever classification is adopted we should bear in mind (i) that many strategies fit quite easily into more than one sub-category, and (ii) that these categories are not mutually exclusive. To give an example; what we have called *Reading on* has been classified as a Metacognitive Strategy as, in general, it is used as a conscious means of manipulating the text or an aspect of the reading process; for example, when the reader consciously decides to continue advancing through the text in order to search for more information – perhaps to ascertain the significance of the focal sentence or perhaps to decipher the meaning of an individual word or phrase. However, *Reading on* may also be thought of as a Task-Based Strategy in that, although the reader may not fully comprehend a given portion of text, he or she decides (i) that it is not relevant to current task requirements and can safely be ignored, or (ii) it is important but is too difficult/requires too much effort to establish the meaning, and must be skipped if the rest of the task is to be completed. *Reading on*, moreover, could further be classed as a Text-Based Strategy; in those cases where the reader picks up on textual clues (such as the structure, questions, lists or headings) which indicate the sort of information which is to follow. Another strategy which could be placed in more than one sub-category is *Paraphrasing or summarising* as it reflects both interpretation processes and integration processes of information arising from the text. Thus, the category labels are to be regarded as descriptive terms indicating not the primary purpose underlying the use of the strategy – which would be to establish meaning – but a more concrete purpose behind strategy use.

Results

Results for Research Question 1

Twenty different reported strategies were identified. These are shown in Table 4, together with a brief description of each strategy's function.

Results for Research Question 2

Of the 20 different strategies identified, 14 were used when reading Spanish texts, 19 were used when reading English texts, and 13, or 65% of all strategies, were reported as having been used to some degree to process both Spanish and English texts (see Table 5

below). If we bear in mind that by their very nature, the three Translation Strategies (*Using L1 or other L2 to understand words or phrases, Mental translation, Literal translation*) are used exclusively when processing L2 texts, as well as the Strategies Using Linguistic Knowledge and the strategy *Revising or Confirming Hypotheses*, the result suggests that, in general terms, there is a certain consistency or correspondence between the strategies used for processing L1 and L2 texts.

Another interesting result we can see is that although the language of the text affects the use of some strategies, the choice of strategy can also be strongly influenced by (1) other characteristics of the text, and by (2) task demands. Table 6 shows the total reported strategy use for each text as a percentage of the whole. Column 1 indicates the strategy used. Column 2 shows the total number of occurrences of the strategy. Columns 3 and 4 show the reported use of the strategy for each task (taking notes or labelling a diagram) as a percentage of the total for each Spanish text, while Columns 5 and 6 show this for the English texts.

We can see from Table 6 how, in the note-taking tasks, the students had to connect information from different sections of the text, how they needed to identify key words and how they sometimes had to re-read, while in the labelling task they needed to search for specific information. It is also clear that the students re-read or read more slowly when there was a large amount of information (names or data) in the text or when the information was very dense. This occurs in the English and the Spanish texts and was confirmed by the students in the retrospective interviews. We may also note that the total reported use of the 5 strategies in Table 6 was greater for the tasks carried out in Spanish than for those carried out in English.

Discussion

The results suggest a number of interesting aspects about the use of comprehension strategies when reading expository texts in L1 and L2. Firstly, some strategies may be low-level, automatic, memory-based processes, such as resonance, but readers also engage in more controlled, strategic processes in an active attempt to explain the meaning of a given text. Secondly, some strategies used by readers to read and comprehend written texts may be specific to language activities (e.g., translation, paraphrasing or searching for an unknown word), while others (such as knowledge integration, reasoning, the use of logic or common sense, inference generation) may also be more generally employed in other types of complex cognitive activities.

What the students say in the think-aloud protocols suggests that, generally speaking, they are aware of many of the strategies they use and can and do control their use, however, it is also the case that the students sometimes knew which strategy they wanted to employ but were unable to do so because they did not understand enough of the text.

We can see this particularly with Student #7. This student had the lowest English proficiency level of any of the participants in the research. Quite often he seems to be aware of what strategies he could use, but his generally poor English prevents him from applying them successfully. To give just one example, in this extract from his protocol for the text on Materials although he looks for clues in the text, tries to link ideas, and even uses headings, he is unable to form a foundation on which to build a representation of the meaning. Note that the participants' introspections below and in the rest of this paper are placed between carrots (<<...>>). They are shown in both English and in the original Spanish. The translations were made by the author.

<<In the next point, it talks a little about design .. I mean, how it has been designed, I don't understand it perfectly the [...] the [...] the short text that follows, but I know that 'design' means *diseñar*

Table 4
The 20 strategies identified from the transcripts

Strategy	Description/function
MEANING-BASED STRATEGIES	
Translation Strategies	
Using L1 or other L2 to understand words or phrases	Using L1 or another L2 to establish or clarify the meaning of individual words or short phrases.
Mental translation (converting the idea to Spanish)	The reader 'converts' or summarises a section of text into his or her L1 in order to clarify the meaning or understand better.
Literal translation	The reader translates longer phrases or sentences word by word (sometimes imposing L1 syntax).
Strategies Using Linguistic Knowledge	
Using grammatical structure to establish meaning	Using knowledge of grammar to establish meaning.
Using other linguistic knowledge to establish meaning	Using other linguistic knowledge (discourse markers, punctuation, morphology) to establish meaning.
Integration Strategies	
Using context	The reader uses the local context to clarify or establish the meaning of a word or phrase.
Connecting information from previous sections of text	The reader explicitly tries to connect or relate information which has occurred previously in the text with the focal sentence.
Integrating the focal sentence with the	The reader explicitly tries to developing mental model integrate or relate the information in the focal sentence with the developing mental model in episodic memory.
Using background subject knowledge	The reader uses domain knowledge to establish or clarify meaning or to elaborate on or extend the information in the text.
Using general knowledge or experience	The reader uses general world knowledge or experience to establish or clarify meaning or to elaborate on or extend the information in the text.
Interpretation Strategies	
Speculating, interpreting, or hypothesising	Establishing a provisional meaning about the significance of a word or phrase which may be modified later 'downstream'.
Paraphrasing or summarising (L1 only)	The reader summarises, comments on or explains the focal sentence in order to clarify or consolidate comprehension.
Text-Based Strategies	
Using textual clues	The reader uses the structure of the text, his or her expectations about the structure, or other textual clues.
Identifying key words or phrases	The reader identifies words or (or unimportant words and phrases) phrases which he or she considers important or, conversly which can be ignored or skipped.
Predicting	The reader predicts upcoming text content or how the text will be organised
METACOGNITIVE STRATEGIES (for monitoring or controlling reading)	
Monitoring or evaluating comprehension	Monitoring comprehension or evaluating understanding. Commenting on the effectiveness of the process or strategy being used. Deciding on strategy use.
Revising or confirming hypotheses	The reader realises a previously established meaning may not be correct and modifies this.
Re-reading, reading more slowly or with greater attention	This strategy reflects various behaviours, including reading more slowly or more carefully. It is used when information can not be assimilated easily.
Reading on	Despite not understanding a portion of the text, the reader continues reading in order to either understand the general idea of the focal sentence or ignore it. It is also used when the reader picks up on textual clues about what is to follow.
TASK-BASED STRATEGIES (used to complete the task)	
Searching for specific information (scanning)	The reader looks for specific information in order to complete the task or to clarify details.

and also what 'requirements' means so it gives me a clue, but there really there aren't many clues and if it weren't for the title I wouldn't have known because there are lots of words I don't understand and the text isn't clear [...] the meaning is cloudy.>> (#7 Materials)

<<[...] En el siguiente punto, me hablan un poco del diseño .. o sea, de sobre cómo se ha diseñado, no es que lo entienda perfectamente el .. el .. el pequeño texto siguiente, pero 'design' sí que sé que es diseñar, y 'requirements' también sé lo que es, por lo que se me da una pista de lo que se me habla, de todas formas tampoco hay muchas pistas,

Table 5
The number of different strategies used for L1 and L2 texts

Total n°. of different strategies reported for all texts	N°. of different strategies used for Spanish (L1) texts		N°. of different strategies used for English (L2) texts		N°. of different strategies used for both L1 and L2 texts	
	N°	%	N°	%	N°	%
20	14	70.0	19	95.0	13	65.0

Table 6
% of total reported strategy use for each text

Strategy	Spanish texts			English texts	
	All texts	N. Ojos	Plutón	Materials	Rosetta
Connecting information from previous sections of text	14	42.9	21.4	35.7	0.0
Using background subject knowledge	24	29.2	37.5	4.1	29.2
Identifying key words or phrases	16	56.2	0.0	25.0	18.8
Re-reading or reading more slowly	56	35.7	19.6	26.8	17.9
Searching for specific information (scanning)	16	12.5	43.75	18.75	25.0

si no es por el título, tampoco lo hubiese sabido, porque hay muchas palabras que no entiendo, y el texto no queda claro [...] se me nubla el significado.>> (#7 Materials)

Below is another example of how lack of vocabulary prevented understanding. In this extract, Student #3 is talking about the second English text:

<<I don't understand anything at all of the next sentence, because I don't know what 'accuracy', 'manoeuvring' or 'vicinity' mean and as I don't understand the words and they are basically the whole sentence I can't understand the sentence.>> (#3 Rosetta)

<<En la siguiente frase vamos, no entiendo nada, porque sigo sin saber lo que es 'accuracy', 'manoeuvring' y 'vicinity', entonces, como no entiendo las palabras, y son básicamente toda la frase, pues no puedo entender la frase.>> (#3 Rosetta)

Another finding is that students don't usually use just one strategy, rather they use several in combination. What Alderson (2000, p. 15) called "constellations of skill and knowledge". The 2 extracts below illustrate how, in order to clarify the meaning of a word or phrase, student #3 reports using translation, inferring from the context, or drawing on grammatical or subject knowledge, all combined with a degree of speculation.

<<For the fourth point, eh, 'compromises' looks like Spanish and I understand *compromiso*, but within the sentence it doesn't .. it doesn't make much sense so I don't know what it means.>> (#3 Materials)

<<Para el cuarto punto, eh, 'compromises' se parece mucho al castellano y me da a entender *compromiso*, pero dentro de la frase no tiene .. no tiene significado, entonces no sé lo que es.>> (#3 Materials)

<<[...] 'on board' I suppose is a *bordo* por 'on' que es *encima*, *en*, and 'board' which is like Spanish and I've invented a bit, but anyway maybe it's not so [...] so important.>> (#3 Rosetta)

<<[...] 'on board' supongo que es a *bordo*, por 'on' que es *encima*, *en*, y 'board' parecido al castellano y me lo he inventado un poco, pero tampoco creo que sea muy [...] muy importante, quizás.>> (#3 Rosetta)

Concerning translation, an important point is that when reading in a second language, readers do not 'switch off', as it were, their L1, rather they make use of it as a tool to understand, to clarify the meanings of words, to establish the meanings of sentences, and to help with the formation of a macrostructure of the text. Furthermore, there is a clear distinction between the three 'translation strategies' we have identified. What we have called *Using L1 or L2 to understand words or short phrases* is used to clarify the meaning of individual

words and consists, basically, in recognising cognates or looking for similarities between the L2 word and an L1 word. To give just three examples from the protocols, 'thermal' → *térmico*; 'vary' → *varía*; 'envisaged' → *visage* [in French] → *cara*. As the last example shows, this does not always result in a correct result.

What we have called 'Literal translation' is normally used for longer phrases or clauses which the reader has not understood and, almost as a final resort, translates word for word into Spanish:

<<I've understood it [...] but [...] thanks to translating it into Spanish because it was easier.>> (#1 Materials)

<<Lo he entendido bien [...] pero [...] gracias al traducirmelo al castellano porque me resulta más fácil.>> (#1 Materials)

This strategy frequently consists of attempting to construct the significance of the phrase by building it up out of the individual meanings of each constituent word, instead of trying to understand the idea behind the words, and sometimes includes a tendency on the part of the reader to impose the syntactic structure of his or her L1. As a consequence, the strategy of *Literal translation* does not always result in comprehension and the participants were aware of this:

<<Each word, I mean, directly translated from Spanish, I understand, but what the sentence means, no, I don't understand that.>> (#3 Materials)

<<Cada palabra, o sea, la traducción directa al castellano la entiendo, pero lo que la frase en sí me quiere decir, no, no la entiendo.>> (#3 Materials)

In the retrospective interview, Subject #1 commented that when reading English texts the procedure she normally tried to follow was to first try to understand the text directly in English. If she was unable to understand, she would 'convert' the meaning into Spanish, and if that failed she would translate literally. 'Converting' or 'summarising' a portion of text is one of the strategies the participants used most frequently, and in many cases it appears to be an almost habitual response. As Subject #2 described it in his interview, 'converting' consisted in "... reading the words in English but understanding in Spanish" (*leer las palabras en inglés pero entender en castellano*). However, in order to convert, the reader must have understood enough of the phrase to form a general idea of what it is about and then to add or elaborate details. The following extracts show how Subjects #1, #6 y #7 reported dealing with the portion of text below from the English text Rosetta Spacecraft Design: "...subsystem reliability maximised by a comprehensive redundancy, including 'hot' redundancy (backup units actually on standby) for functions which are essential for a continuous, uninterrupted operation during critical mission phases" (Rosetta Spacecraft Design, ll. 44-46)

We will start with #7 whose lack of vocabulary did not allow him to capture the meaning of the sentence.

<<The next point, I don't know either what it's talking about. There are some words which give me clues, but [...] for example, at the very beginning of the text it says 'subsystem' which must be *subsistema*, but at the end of the sentence, at the end of the text it also says 'during critical mission phases' which will be during the critical phases of the mission, but between these there's nothing .. I can't see any clue which helps me to connect one with another, to really know what it's talking about.>> (#7 Rosetta)

<<El siguiente punto, no sé tampoco de lo que se me está hablando. Hay algunas palabras que me indican algunas pistas, pero .. por ejemplo, nada más empezar el texto me dicen *subsystem* será *subsistema*, no .. pero al final de la frase, al final del texto, me dice también *during critical mission phases*, será *durante las fases críticas de la misión*, pero es que entre medias de esas dos no hay .. no veo ninguna pista que me ayude a enlazar una con otra, para saber perfectamente de lo que me están hablando.>> (#7 Rosetta)

<<I don't really understand the beginning of the phrase but, well, the main point I understand that it needs .. that there are some functions which are essential so that .. so that they can work during critical moments and need to .. I don't know, do things which normally it wouldn't do because, I don't know, because it's a critical moment.>> (1 Rosetta)

<<No entiendo mucho lo que quiere decir el principio de la frase, pero, hombre, lo que es la base de la frase entiendo que necesita .. hay unas funciones que son esenciales para que la .. para que puedan funcionar en caso de que haya un momento crítico y necesite .. no sé, hacer cosas que normalmente no haría porque, no sé, porque es un momento crítico.>> (#1 Rosetta)

<<In the ninth sentence it talks about the main systems, the ones which are vital for the mission and which don't stop under any circumstances no matter what happens.>> (#6 Rosetta)

<<En el noveno punto habla sobre los sistemas que son principales y vitales para que pueda funcionar esta misión, y no se interrumpa por ninguna circunstancia que lo pueda producir.>> (#6 Rosetta)

Mental translation can be regarded as a form of paraphrasing in that the reader frequently attends only to the main points of the text segment in focus. The 3 examples above show how Participants #1 and #6 focused on the main ideas in the passage while Participant #7 was more 'word-bound' (Grabe, 1991),

Conclusions

In this paper we have described an experiment designed to identify the reading comprehension strategies employed by a group of learners while reading expository texts in Spanish (their L1) and in English (their L2) and using these texts to complete 2 types of information-transfer tasks.

The first important point to be made is that in general terms readers used largely the same strategies when carrying out the reading tasks in Spanish (L1) and in English (L2) and are able to control their use. Second, the main reason comprehension difficulties arose was due to a lack of vocabulary and in these instances readers seemed to be aware of which strategies could be used – even when their lexical limitations prevented them from applying the strategy successfully. Third, when reading in an L2, readers do not 'switch off', as it were, their L1, rather they make use of it as a tool to understand, to clarify the meanings of words, to establish the meanings of sentences, to help with the formation of propositions and to integrate these into a macrostructure of the text. In fact, what we have called *Mental translation* or *Converting the idea into Spanish* seems to be almost

automatic at the lower-intermediate/elementary level of proficiency. As one student said: "I read in English, but think in Spanish" (*'leo las palabras en inglés pero entiendo en castellano'*). This means that the instruction often given to students to read directly in English, is unrealistic and possibly counter-productive. In order to use one of the translation strategies, or, indeed, any strategy, the reader must understand enough of the text to be able to apply it successfully.

Fourth, most reported instances of strategy use show combinations of two or more strategies. For example, Student #3's think-aloud protocols, as the extracts show, contain numerous instances where, in order to clarify the meaning of a word or phrase, she reports using translation, inferring from the context, or drawing on grammatical or subject knowledge, all combined with a degree of speculation.

Finally, while language aspects appear to have influenced the use of some strategies, other instances of strategy use have been largely determined by (i) the nature of the task, (ii) characteristics of the text other than the language in which it was written (such as density of information), (iii) task demands, and (iv) the motivations of the readers and their attitudes to reading in general and to the task in hand.

Conflicts of interest

The authors of this article declare no conflicts of interest.

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