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Understanding Spanish University Students' Monitoring Failures and Regulatory Actions When Reading in EFL

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ABSTRACT

The present paper analyses the reasons for comprehension monitoring failure and the regulatory actions performed by Spanish university students when reading in English as a Foreign Language (EFL). Two different but connected empirical studies were conducted to obtain data about students' behaviour during a reading task. In Study 1, comprehension monitoring was assessed following the Error Detection Paradigm. Then, semi-structured interviews were conducted to analyse subjects' regulatory actions. In Study 2, a questionnaire was proposed to classify subjects' detection X regulation actions when reading in EFL. Results showed that participants' comprehension monitoring level was not very high according to other literature findings. Moreover, the lack of language proficiency could imply additional processing and monitoring difficulties. The questionnaire accounted for a great percentage of participants' behaviour: semantic obstacles, spurious detections, no re-reading, skip information or no detection. Knowing students' reading obstacles is necessary for teachers and practitioners in order to help students become effective readers.

KEYWORDS

Teaching English as a Foreign Language; Reading Comprehension; Comprehension Monitoring; Regulatory Actions; Higher Education.

1. INTRODUCTION

Studying certain degrees in English as a Foreign Language (EFL onwards) has become quite normal at Spanish universities since their integration in the European Higher Education Area (EHEA, http://www.ehea.info/). However, understanding university-level information in

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English may result in a highly demanding task for students. As some research studies pointed out (Koda, 2005, 2007; Oxford, 2011; van Gelderen et al., 2004), reading comprehension in L2 involves the interaction of two components: linguistic knowledge and processing reading strategies. Therefore, university students would need an advanced level of language proficiency, but also other cognitive and metacognitive skills implied in reading comprehension processes.

In addition, learning at university is an autonomous process in which learners should regulate their own learning process and make decisions on what, where, when and how to learn according to their own goals. In this context, having well-developed metacognitive skills is essential to understand university materials deeply. In general, academic information is acquired by means of expository texts that differ from other types of texts because they explain natural phenomena, laws, and principles (Mason, Pluchino & Tornatora, 2013). Because of the complexity of their reading, comprehension becomes a complex activity that requires higher-order cognitive processes (Gernsbacher & Kaschak, 2013).

1.1. Metacognitive Skills in Learning Processes: Comprehension Monitoring

The relevance that metacognitive skills have gained in learning processes and, particularly, in reading comprehension, has inspired many researchers since they have been proved to be very important for academic success in general (Wang, Haertel & Walberg, 1993): students who manage their metacognitive skills consciously are more capable of learning efficiently and, consequently, their academic results are more successful (Lahuerta, 2011; Sánchez-Cruzado & Sánchez Compaña, 2020). Particularly, it has been found in many research studies that when learners are aware of their use of metacognitive strategies, their reading comprehension is fostered (Teng, 2020; Zhang et al., 2008).

Many attempts have been made to design and validate instruments to assess metacognitive strategies when reading. For instance, Jacobs and Paris (1987) developed the Index Reading Awareness (IRA) scale in order to measure four important aspects of metacognition: evaluation, planning, regulation and conditional learning. McLain, Gridley and MacIntosh's (1991) questionnaire, known as Metacognitive Reading Awareness (MRA), was aimed at collecting information about students' procedures used to recall and solve reading difficulties. In the same vein, Schraw and Dennison's (1994) Metacognitive Awareness Inventory (MAI) evaluated students' perceptions about their own metacognitive skills. Pereira-Lair and Deane (1997) designed the Reading Strategy Use (RSU) to know adolescents' perception of their use of strategies when reading expository and narrative texts. Mokhtari and Reichard's (2002) Metacognitive Awareness of Reading Strategies Inventory (MARSI) evaluated metacognitive awareness and self-perceived use of reading strategies in adolescents and adults when reading academic materials. In the Spanish context, Jiménez et al. (2009) designed the Reading Awareness Scale (ESCOLA, in Spanish), an instrument to

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evaluate metacognition and executive functions in reading comprehension tasks. In the field of foreign languages, Mokhtari and Sheorey (2002) designed the Survey of Reading Strategies (SORS), which was an instrument similar to MARSI but addressed to reading in English as a foreign or second language.

The above instruments provide information on the frequency and the kind of metacognitive strategies used when reading a text according to the subjects' self-perception of their performance. Sometimes, self-administered questionnaires may not be sufficiently accurate or may be somehow subjective since participants tend to answer what they believe they do and not 'what they actually do' when they face a text or a reading task. Moreover, tests are not answered just after finishing a specific reading task. Therefore, subjects may answer the items thinking about what they think they do when reading a text in general. Another drawback would be that these tests evaluate all the metacognitive strategies at the same time, without delving into any of them (because this is not their aim). Nevertheless, there are strategies complex enough to be dealt with separately in a specific questionnaire.

Therefore, connecting these tests with a specific task is essential, as well as concentrating in one specific metacognitive strategy. In that way, the subject could answer the questions and recall what they have already done in a near real-time task. Once these data are obtained, it would be important for psychological and pedagogical purposes to delve into a particular metacognitive strategy, assess it in a real reading task, and contrast this performance with the self-perceived use subjects report.

Thus, the present paper focuses on the evaluation of a single (though complex) metacognitive strategy: comprehension monitoring. Comprehension monitoring implies being aware of one's comprehension obstacles during reading (Nelson & Narens, 1990), that is to say, being conscious that you do not understand. Comprehension monitoring is one of the most important metacognitive strategies for learning since it has been proven to be a good predictor of academic success in general (Krasiejko, 2010; Otero & Campanario, 1990; Otero et al., 1992; Veenman et al., 2004). Considering the widely-accepted simple model of comprehension monitoring proposed by Nelson and Narens (1990), and its subsequent updates and applications, comprehension monitoring entails two processes: a) the reader's awareness of the extent to which he/she has understood the text; b) the reader's decisions taken in this regard. Nelson and Narens called these two processes "control" and "monitoring" (self-regulation of comprehension). On the one hand, control consists in the evaluation of comprehension, that is to say, being conscious of reading difficulties. On the other hand, monitoring involves taking regulatory actions to solve out comprehension problems found while reading.

This metacognitive skill is essential for every reader but especially for students who are supposed to learn in an autonomous way, such as university students. Being aware of

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reading obstacles is important, but also the actions carried out to overcome them, which are called regulatory actions. Therefore, this study will also account for subjects' behaviour (regulatory actions) and the reasons why they do 'what they do' to overcome reading obstacles in a real-time task in English as a Foreign Language (EFL onwards).

Frequently, evaluation of comprehension is assessed by the Error Detection Paradigm (Baker, 1979; Baker & Anderson, 1982). Inconsistencies are embedded in texts and readers' comprehension monitoring behaviour is assessed by their ability to detect and report them. According to Kintsch Construction and Integration model (CI, Kintsch, 1988), when readers detect an inconsistency between two propositions (units of meaning), they should, at least, build and process each of them together in the same 'processing cycle' in working memory (WM onwards). As they receive the same amount of activation, they are compared and the detection of the flaw takes place.

Winograd and Johnston (1982) suggested that when subjects failed in pointing out the error, they should not necessarily be considered to have monitored their comprehension poorly. There may be different reasons for this 'incoherent' behaviour: a) a lack of prior knowledge, which may cause that readers overlook the inconsistency; b) subjects may trust that the text contains no errors; c) they may use 'fix-up' strategies (like making inferences or draw upon prior knowledge) to overcome the comprehension obstacle; d) they may assign a different meaning to the text; or e) they may ignore the error and continue reading to see whether subsequent text information resolves the obstacle.

Inconsistent information can be understood as some kind of "anomalous data" for readers: textual information that contradicts their beliefs or their prior knowledge. Readers can respond to inconsistencies detected in texts in several ways in an attempt to restore textual coherence. These responses are called regulatory actions. Chinn and Brewer (1993) provided a detailed analysis of the different regulatory actions that students of science used when they detected anomalous data. Subjects tended to reject or exclude these data from the reading context; hold the data in abeyance, reinterpret them, or accept the data. Assessing monitoring performance should consider this variety of regulation possibilities.

In this vein, Otero and Campanario (1990) proposed a simple taxonomy to analyse subjects' monitoring behaviour when they read science texts with embedded inconsistencies. They classified students' monitoring actions in three broad categories: a) Adequate evaluation and regulation: the subject detects the embedded inconsistency, and points it out properly; b) Adequate evaluation but inadequate regulation: the inconsistency is detected but the reader does nothing to restore textual coherence or takes inappropriate actions to solve it out; and c) Absence of evaluation, that is to say, the subject is completely unaware of the inconsistency. This proposal generated an instrument to assess monitoring performance which was validated and used in subsequent studies (Otero, Campanario & Hopkins, 1992; Sanjosé, Fernández & Vidal-Abarca, 2010).

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1.2. Additional Monitoring Obstacles when Reading in EFL

Assuming the idea that reading is a 'cognitive enterprise', regardless of the language, and is the result of the interaction between the reader, the text and the context in which it takes place (Flavell, 1979), it could also be thought that a subject may have the same reading difficulties, independently from the language of the text being read. In this vein, there were many research studies which claimed that the strategies a subject had learnt in their mother tongue could be transferred to other languages (Bernahrdt & Kamil, 1995).

Nevertheless, it has been proven in other research studies that although some subjects may be competent readers in their mother tongue, they may have specific comprehension and processing troubles when reading in a foreign language (Dhanapala, 2010; Tsai, Ernst & Talley, 2010; Yamashita, 2002; Yang, 2006). In fact, many studies have pointed out that reading in L2/EFL is conceived as a 'hard task' for learners (Al-Jarrah y Ismail, 2018; Pei, 2014; Qrqez & Ab Rashid, 2017; Shang, 2015). These results in low levels of reading comprehension and in monitoring and regulating their own comprehension. Regarding comprehension monitoring in L2/EFL, research studies with university students agree on the fact that learners control their comprehension in a better way in their mother tongue than in the L2/Foreign language (Dhanapala 2010; Gómez, Devís & Sanjosé, 2013; Talebi et al., 2014; Tsai, Ernst and Talley 2010). It has been proven that in spite of the fact that these subjects are competent readers in their mother tongue, they have specific problems to monitor their comprehension in the foreign language.

Some of the issues reported by this literature are: a) low vocabulary knowledge and impossibility to access word or simple clause meaning; b) attribution of a wrong meaning to explicit text ideas; c) skipping some fragments of the text they cannot understand; d) difficulty of building macro-ideas and establish global coherence; e) impossibility of linking micro-ideas for local coherence.

Problems (a) and (b) may be due to a lack of linguistic knowledge in EFL. This would prevent readers from understanding single words or even sentences and, therefore, make it difficult to control their comprehension. However, problems (c), (d) and (e) could be caused by processing restrictions. Having a low level of language competence means that there is a lack of automation of low-level processes involved in language decoding (Koda, 2007; Perfetti, 1985; Taguchi, Gorsuch & Sasamoto, 2006). Subjects use translation to their mother tongue (author) in order to help them understand. This overuse of translation results in working memory overload. Consequently, there would not be free cognitive resources to perform the 'high-level' operations involved in (d) and (e) (Kozminsky & Graetz, 1986). In order to release their WM and free some resources, the reader may skip some text fragments (c). Therefore, WM overload caused by a limited linguistic competence may, in turn, lead to specific monitoring difficulties.

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Consequently, comprehension monitoring could be a resource-consuming activity by itself when reading in EFL. Considering the aforementioned CI model (Kintsch, 1988), the limited linguistic knowledge could prevent subjects building propositions correctly; or if they are able to build the propositions, they may fail to process them in the same cycle since WM overload could cause propositions to receive different amounts of activation. If one of these problems happens, propositions will not be processed together in the same cycle and, therefore, they will not be compared and the inconsistency or reading obstacle will not be detected (Vosniadou et al., 1988).

In the light of what has been said above, apart from those readers' behaviour in the face of inconsistent information described by Otero and Campanario's (1990) taxonomy, low proficient language users are expected to have specific monitoring difficulties related to a limited linguistic competence. For instance, they may understand the text erroneously, overlook some contradictions in error-detection tasks, detect spurious inconsistencies (in other words, believe that there is an inconsistency or mistake in a correct idea) or make experimental contradictions vanish (Chinn & Brewer, 1993). Therefore, it may be relevant to observe not only the low-proficiency language users' performance in a reading task (comprehension monitoring) but also delve into the reasons that explain their behaviour (regulatory actions when confronted with anomalous data).

Therefore, the aim of this paper is to evaluate comprehension monitoring of university students when reading in EFL and to account for and delve into their behaviour in the face of reading obstacles (anomalous data). Knowing students' comprehension monitoring difficulties and the actions they carried out to overcome them could help teachers and practitioners focus their reading programmes accordingly.

Thus, two different yet related empirical studies were conducted with Spanish university students reading texts in English as a foreign language (EFL onwards). In Study 1 participants performed an error detection task where comprehension monitoring was evaluated. Then, they were individually interviewed to obtain additional evidence about possible reasons of monitoring success or failure (self-perceived regulatory actions). The research questions of this study were the following:

RQ1: What is the level of comprehension monitoring of university students with different language proficiency while reading in English? (comprehension monitoring evaluation)

RQ2: What kind of regulatory actions did Spanish university students perform after detecting inconsistencies in texts written in English, and how did they explain them? (regulation of comprehension)

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From the quantitative and qualitative data obtained in Study 1, a questionnaire was designed to account for monitoring performance in Study 2. It accounted for a variety of participants' behaviours and their self-perceived reasons (regulatory actions) for monitoring success or failure. As in Study 1, participants performed a comprehension monitoring task in EFL and then filled in the questionnaire. The research questions for Study 2 were:

RQ3: How many different detection and regulatory behaviours can be distinguished and typified when Spanish university students read a text in English for comprehension?

RQ4: Are there differences among detection and regulation behaviours shown by subjects regarding their English proficiency?

2. METHODOLOGY

2.1. Participants

Participation in the experiment was voluntary and subjects agreed to take part in the experiment freely. Forty male and female Spanish university students (aged 18-25) participated in Study 1. They belonged to two intact groups from two different university degrees-Information science, and Advertising and Public Relations- from an important Spanish city. They were all enrolled in English (as a FL) subjects. Participants' English proficiency level was assessed by means of the Quick Placement Test (QPT, UCLES, 2001). According to the Common European Framework of Reference for Languages (CEFRL, Council of Europe, 2001), the sample distribution was: 63% on the A1-A2 levels (elementary level) and 37% on the B1-B2 levels (intermediate level).

In Study 2, 65 male and female Spanish undergraduates (aged 18-24), different from Study 1, participated in the experiment. They belonged to two intact groups from the degree in Primary School Teacher Education. They were all enrolled in English (as a FL) subjects. As in Study 1, participants' English proficiency level was assessed (QPT, UCLES, 2001) and the sample distribution was: 68% on the A1-A2 levels (elementary level) and 32% on the B1-B2 levels (intermediate level).

2.2. Design

Two correlative Studies were performed. Study 1 was a two-phase (quantitative and qualitative) exploratory study aimed at analysing the comprehension obstacles students point out when they read in EFL. In the quantitative phase comprehension monitoring was evaluated. The experiment was a replication of previous studies (author). Students' task consisted in 'judging' the comprehensibility of texts and highlighting the obstacles they found when reading. As in previous studies, texts contained embedded inconsistencies following the Error Detection Paradigm (Baker, 1985; Baker & Anderson, 1982; Winograd &

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Johnston, 1982). Thus, the dependent variables were the number of embedded errors correctly detected and highlighted when reading the texts. In the qualitative phase individual semi-structured interviews were conducted to obtain more accurate data of participants' reading behaviour and regulatory actions.

In Study 2, a taxonomy was proposed, drawing on results from Study 1, for Spanish students' detection X regulation actions when reading in EFL. This taxonomy was based on previous studies (Chinn & Brewer, 1993; Otero, Campanario & Hopkins, 1992; Sanjosé, Fernández & Vidal-Abarca, 2010; Winograd & Johnston, 1982) and was aimed at collecting data of subjects' detection or non-detection of anomalous data, and the actions they perform on them. From the taxonomy, an initial and tentative questionnaire was elaborated in a paper-and-pencil format which contained different detection and regulatory actions. Data from the questionnaires were analysed and evaluated in Study 2.

2.3. Data Collection: Materials, Measures and Procedure

In the first stage of Study 1, three previously validated short texts about general Science topics were used to assess comprehension monitoring skills (author). Texts were written with the same structure (3 paragraphs), similar length (between 210 and 230 words) and level of reading difficulty (Flesch scale: 60-70). One of the texts was free of errors and the other two contained four embedded errors: a) Two inappropriate adjectives (for instance, 'hot ice'); b) two macro-ideas which contradicted other previous important text ideas. Students were asked to 'judge' the comprehensibility of texts and underline the pieces of information they did not understand. They were not informed about the inconsistencies. Therefore, comprehension monitoring was evaluated by computing the number of correct detections of the embedded inconsistencies (maximum of 8, 4 in each text).

In the second stage, individual semi-structured interviews were conducted in order to provide an in-depth analysis of students' CM processes. Ten students were randomly selected and interviewed after the comprehension monitoring task. Interviews were recorded and transcribed to be analysed. They would provide information about how subjects deal with inconsistencies when reading in a foreign language. In a private place, each informant was provided with the error detection task they had performed in a previous session, and they were asked about the reason why he/she had underlined certain pieces of information in the texts (regardless of whether they were embedded errors or not). The participant had the opportunity to explain the meaning he/she attributed to some text ideas. Next, the interviewer informed the participant about the presence of inconsistencies in texts. Finally, the participant was asked about the reason why he/she had not pointed them out, if it was the case.

From the transcription of interviews, participants' ideas corresponding to detection and regulation actions were provisionally classified using the categories proposed by Otero

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and Campanario (1990) and validated in other studies (Otero, Campanario & Hopkins, 1992; Sanjosé, Fernández & Vidal-Abarca, 2010). Thus, the questionnaire was elaborated (see Appendix) with four main sections (according to subjects' responses, an extra section for 'spurious detections' was added): 1) Adequate evaluation and regulation; 2) Spurious detection (inadequate detection, inadequate regulation); 3) Adequate evaluation but inadequate regulation; and 4) Absence of evaluation. Chinn and Brewer's (1993) and Winograd and Johnston's (1982) studies were followed to classify participants' behaviour when confronted with anomalous data (regulatory actions) and it also included the specific monitoring difficulties low English proficiency users may have when reading texts in that foreign language (English proficiency level, lack of prior knowledge, place information in abeyance, skip information, absence of re-reading, etc.).

Two class sessions (50 min each) were necessary to complete Study 1. In the first session, students did the English placement test. In the second session, CM measures were taken. The instructions and some examples to practice were given to the participants before handing out the texts (one by one, in a counter-balanced order). Participants were asked to judge the comprehensibility of the texts and write down the comprehension obstacles they might find. Once finished, 10 students were randomly selected to be interviewed. The interviews were conducted individually and were recorded (with the subjects' permission) for their transcription and analysis. Each of them took less than 20 min.

On the other hand, two class sessions were also needed to complete Study 2. First, students completed the English placement test. Second, students performed a similar error detection task as in Study 1. When the task was finished, the students filled in the questionnaire. In Study 2, the same texts as in Study 1 were used but only two explicit contradictions between text macro-ideas were embedded. In that way, the error detection task was simplified to enable participants to remember their performance (and the reasons for their behaviour) when they had to fill in the questionnaire. In addition, the effect of "external" knowledge on monitoring performance was reduced. As in Study 1, each participant read two experimental texts to judge their comprehensibility and comprehension monitoring was evaluated by computing the number of correct detections of the embedded inconsistencies (maximum of 4, 2 in each text). The total time was limited to 30 min.

After this task, the questionnaire and the instructions to complete it were administered to the group of participants. The instructions contained the texts they had read in the CM task, with the embedded inconsistencies highlighted and explained. They were asked to mark the reasons for their monitoring and the regulatory actions performed. The questionnaire completion took less than 20 min.

The answers were coded as "1/0" for "yes/no" in each statement. The number and percentage of regulatory actions stated by the participants were computed. An open

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blankspace called “Other reasons” was added in each section. Participants could point out other reasons for their behaviour not included in the questionnaire.

3. RESULTS

3.1. Study 1

Globally, participants’ error detection in the comprehension monitoring task was scarce when reading in English. Table 1 shows the mean values (Standard Deviation) for the correct detection of inconsistencies in relation to English proficiency levels. Around 68% of the participants did not detect any, or only one, of the embedded inconsistencies.

A remarkable fact that drew our attention was that 80% of the participants pointed out other correct pieces of information as ‘inconsistent’, apart from the embedded errors. This ‘inadequate’ evaluation is called ‘spurious’ detection (Chinn & Brewer, 1993). A total number of 133 of such ‘spurious detections’ were highlighted by participants. These ‘spurious detections’ did not appear in Otero and Campanario’s study, where science texts in the subjects’ mother tongue were used. Hence, this result could be associated with readers' low language proficiency in English. Table 1 shows the averages of correct monitoring of embedded inconsistencies, as well as spurious detections, according to participants’ level of English proficiency.

Table 1. Mean values (Standard Deviation) of correct and spurious monitoring actions per participant in Study 1.

English Level (CEFRL)	Correct Detection & Regulation (max =8)	Spurious Detection
A1-A2	1.4 (1.3)	3.2 (3.0)
B1-B2	2.6 (2.0)	3.7 (2.9)
Global	1.8 (1.7)	3.3 (2.9)

Data coming from the interviews let us supplement and delve into the results obtained in the quantitative phase. The following are examples of participants’ different behaviour before inconsistencies:

A) Inconsistency detection and correct regulation

The subject comprehended the text well and he/she detected the inconsistency and reported it. Table 1 shows that this behaviour was not very frequent among the participants: “I have written down ‘polar jungles’ because it is nonsense. It is perfectly written but polar jungles do not exist, do they?” (Subject #57).

Likewise, subject #83 pointed out one of the internal inconsistencies embedded in the final paragraph of the text ‘Amphibians’: “In my opinion, this is a contradiction, because here

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[he pointed to a piece of the text] one can read that there is an increase in the number of frog species but here [he pointed to another piece of the text] it is said that they are disappearing."

B) Spurious detection: detecting an inconsistency in a correct idea.

This category was, along with non-detection, one of the most common ones. In this case, the subject thought that the meaning of a correct idea was wrong or inconsistent. After the 'false detection', he/she carried out the appropriate regulatory actions accordingly (in this experiment, he/she wrote down the inconsistent information).

Within this category, three kinds of different behaviour were observed:

B.1) Spurious detection of a spelling or grammatical mistake: Subject #57: [the subject wrote down the sentence: 'chimpanzees and gorillas evolved from a common ancestor']: "I have highlighted 'evolved' because it was as if…I thought it was misspelt…it should be 'en', 'envolved', that is to say, with 'n'…".

B.2) Misunderstanding of a correct idea, due to limited English proficiency, which results in a new contradiction in the text: [the subject highlights 'any drastic change in the natural world is likely to affect amphibians first']: "it is said that none of the drastic natural changes could affect them…and before [the subject points out the sentence: 'it makes them very sensitive to the effects of climate change and pollution']… it is said that they are very sensitive to the changes" (Subject #83). Within this behaviour, another similar one was observed, in which the reader associated a wrong meaning to the embedded inconsistency, again due to his/her low language proficiency or bad translation. However, the resulting idea was still nonsense and the subject pointed it out: "I have written down 'polar jungles' because the sentence was meaningless… because I understood that in Spain the climate was…was like polar, or something similar. Then, I did not understand the sentence, because it was as if in Spain the climate was cold…well…I understood that" (Subject #67). Another example was Subject #57, who considered that the external inconsistency 'rocky living beings' was absurd because she translated it erroneously: "(…) rocky…this is like…I don't know… it reminded me of Rock, Rock & Roll. And I thought, what does Rock have to do with living beings? I did not understand it".

B.3) Incoherence created by inappropriate reader's prior knowledge. For instance, Subject #28 [this participant considered that the following idea was absurd: 'amphibians' skin is one of Nature's best indicators …']: "I don't understand how, for instance, the skin…can be an indicator. The skin…I don't know…it is an amphibian… I think that…the skin colour… I can't see the relationship between the skin and an indicator…Perhaps it has to do with chameleons. I don't know".

C) Inconsistency detection with inappropriate regulation.

Some students monitored their comprehension correctly and detected the embedded inconsistencies. However, they did not write them down as it had been indicated in the

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instructions. Within this category, different behaviours were also found:

C.1) Attribution of the inconsistency to a restricted linguistic competence or to the topic of the text. Subject #54 did not point out the two contradictions embedded in the last paragraph of the text 'Amphibians': "(…) when I read this paragraph, I thought that it has no sense with the information provided before, with this…[she pointed to previous paragraphs] but I thought that I had not understood the text properly. I thought it was because of my English level that I had not understood the text".

C.2) Holding in abeyance or ignoring the inconsistent information detected. Subject #15: [In the second part of the interview, the researcher pointed to the inconsistency 'polar jungles', which the participant had not highlighted in his exercise, and asked him whether he had detected it]"(…) well, I passed by… I read it and said it was strange…but I didn't point it out. I passed by…I read it and went ahead".

D) The inconsistency is not detected. Therefore, there is no regulation.

This was the most frequent category. Within this category, two possibilities were observed:

D.1) There is a good comprehension of the text, though bad monitoring.

For instance, when subject #15 was asked if he had detected the two contradictions in the last paragraph from the text 'Amphibians and Global Warming', he claimed, "I did not notice them…I read paragraph per paragraph…the main idea from this [he pointed out a paragraph], the idea from this other… [he pointed out another one], and, finally, I did not link them, I did not notice if they make sense or not."

Subject #11 failed at detecting the external inconsistency 'holy characteristics' of the text 'Evolution and Primates' and she said, "I did not realise that 'holy' was there. I think I read 'they share similar characteristics' [instead of 'they share holy characteristics'], that is, I did not realise it".

D.2) There is a bad comprehension of the text.

Due to their limited English proficiency, other participants attributed a wrong meaning to the text information (the main reason was an incorrect translation into their mother tongue). In that way, they made the inconsistency disappear: "I remember that this one [she pointed to 'lunar habitats']… I translated it as…I understood as if the moon influenced, or something like that…but I did not translate it as 'los hábitats lunares' [Spanish translation]… I understood another thing" (Subject #83).

Before the inconsistency 'rocky living beings', Subject #15 said: "I translated it as way of living, or just as living. I did not realise that there was a mistake. On the one hand, I translated 'rocky' into 'rocoso' [Spanish translation]. And, on the other hand, I translated 'living beings' into 'way of living'. But I did not link them" [she says that she did not connect rocky + living beings. She translated them separately and she did not link them to understand the whole idea].

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3.2. Study 2

Globally, participants' comprehension monitoring of textual inconsistencies was also very limited, as in Study 1. The averages in language proficiency levels were very similar in both studies. The mean values (Standard Deviation) are shown in Table 2. In line with Study 1 and with previous research work, 80% of the students detected 0 or 1 out of the 4 contradictions embedded in the texts. Only 1.5% of the participants detected the four embedded inconsistencies.

Table 2. Mean (Standard Deviation) values of correct and spurious monitoring actions per participant in Study 2.

English Level (CEFRL)	Correct Detection & Regulation (max=4)	Spurious Detection
A1-A2	0.5 (0.7)	0.7 (0.9)
B1-B2	1.8 (1.0)	1.0 (1.1)
Global	0.9 (1.0)	0.8 (1.0)

In Study 2, the correct detection and regulation of the embedded inconsistencies reached the same average level (22.5%) as in Study 1 (note that in Study 2 we embedded half of the inconsistencies of Study 1). Spurious detections of inconsistencies were found in about 52% of the participants, averaging 0.8 spurious detections per participant. These figures are substantially lower than in Study 1, probably due to background factors: participants in Study 1 were students from the degrees of Information science, and Advertising and public relations, and participants in Study 2 were pre-service teachers. These results were also obtained in Section #1 of the questionnaire (detection of inconsistencies and the performance of correct regulation actions).

Regarding the rest of the data collected in the questionnaire, Figure 1 shows the percentages of answers concerning section #2 (Spurious detection) in relation to English proficiency levels. Most participants with an elementary English level stated that their low linguistic knowledge led them to misunderstand the text information and to think there were other mistakes in the texts. On the other hand, participants with intermediate English level pointed out that the main reason was the influence of their prior knowledge on the text comprehension, as well as their English proficiency.

As it can be observed, a small percentage of 'Other reasons' answers (4,6 percent, corresponding to 3 participants) was collected. Two researchers revised participants' answers and related them to their performance in the error detection task. The three answers in 'Other reasons' resulted in two new options (not considered previously): 'careless reading' (the reader indicates he/she did not pay the attention needed in the task) and 'additional inconsis-

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tency' (the participant maintains that there was another additional inconsistency in the texts apart from the experimental ones). These new two options should be added to the next version of the questionnaire for future validation.

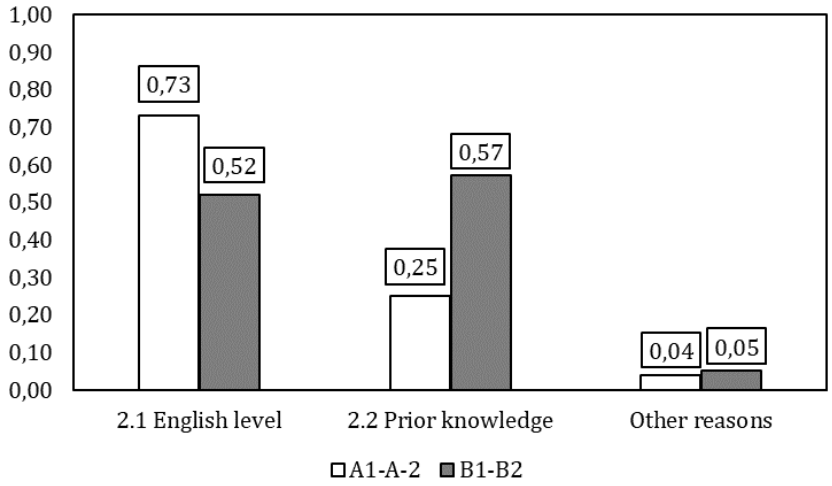

Figure 1. Percentages of participants' answers in Section#2 (Spurious detection) about their monitoring performance and according to their English proficiency level.

As far as Section #3 is concerned (Detection but Inadequate regulation), students' reasons for having detected but not pointed out the inconsistencies are also different between A1-A2 and B1-B2 levels, as portrayed in Figure 2. The former thought that the main reason for this behaviour was their English competence or their lack of prior knowledge. However, intermediate students of English preferred to hold the inconsistent information in abeyance and continue reading to see if the text provided them with more information.

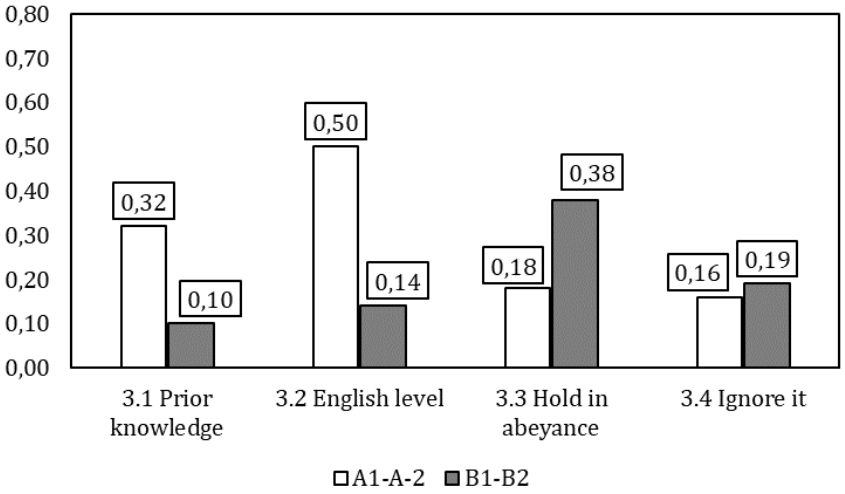

Figure 2. Percentages of participants' answers in Section#3 (Detection, No regulation) about their monitoring performance and according to their English proficiency level.

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After the results obtained in the comprehension monitoring task, Section#4 (No detection, no regulation) was of special interest in this study. Figure 3 shows the percentages of answers concerning Section #4 in relation to English proficiency levels (remember that item 4.4 was a reading control item).

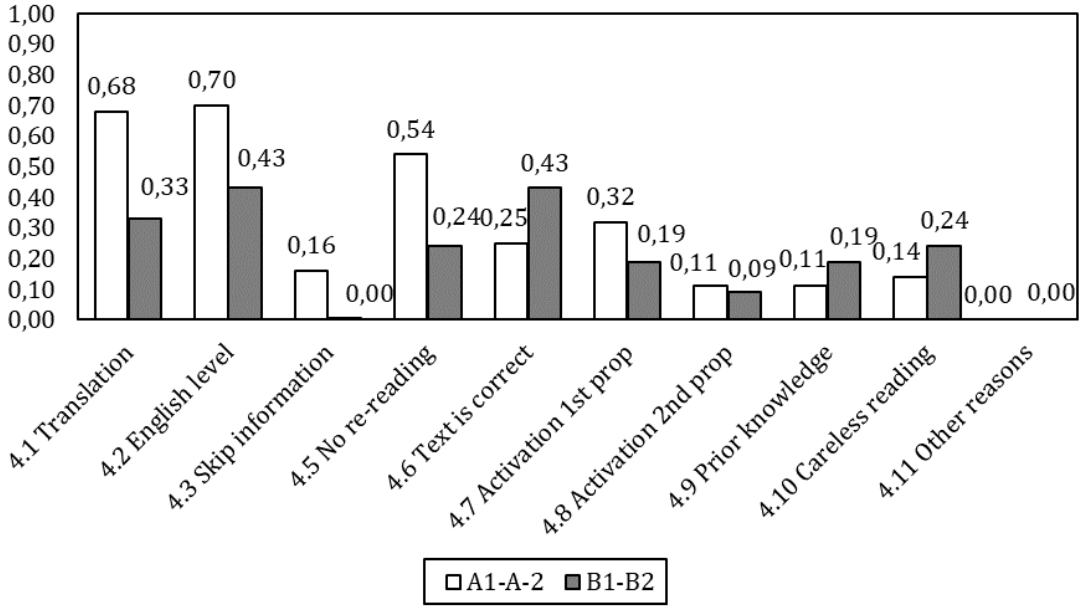

Figure 3. Percentages of participants' answers in Section#4 (No Detection, No regulation) about their monitoring performance and according to their English proficiency level.

The most common regulation patterns for students with elementary English proficiency were again related to linguistic mastery (4.2 English level): they thought that their language command was poor and that they constantly translated pieces of text to their L1 to understand it (4.1 Translation).

On the other hand, students with intermediate levels of proficiency had more confidence in the text and they thought the text did not contain mistakes (4.6 Text is correct). Some of the students also pointed out linguistic (4.2) or translation problems (4.1).

4. DISCUSSION

In the present paper comprehension monitoring during reading in EFL was evaluated in two related empirical studies (RQ1). In both studies most students failed to detect all the embedded inconsistencies: in Study 1 68% detected 0 or 1 out of 4 inconsistencies; in Study 2 80% detected 0 or 1 out of 4 inconsistencies. These results are in line with other previous work (Dhanapala, 2010; Gómez, Devís & Sanjosé, 2013; Talebi et al., 2014; Tsai, Ernst & Talley, 2010), where university students with intermediate levels of English proficiency (B1/B2) had serious obstacles to detect inconsistencies in text's macroideas.

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However, a surprising fact that was obtained in the results of this paper and was not reported in the above-mentioned research studies was 'spurious detection' (Chinn & Brewer, 1993): subjects of the present study considered there were other pieces of inconsistent information in the texts, apart from the deliberate errors. Spurious detection was found in 80% of participants in Study 1 and 52% in Study 2. This is a kind of 'inadequate evaluation', which was not included in Otero and Campanario's study in L1 (Spanish). This result could be associated with readers' low language proficiency and explained by research studies on readers' processing difficulties: when readers' EFL vocabulary knowledge is insufficiently developed, and there is a lack of automation of low-level processes (Koda, 2007, Taguchi, Gorsuch & Sasamoto, 2006), they may have problems to access text words and the meaning of simple clauses. Thus, they may attribute a wrong meaning to textual ideas (Dhanapala, 2010; Gómez, Devís & Sanjosé, 2013; Talebi et al., 2014; Tsai, Ernst & Talley, 2010). Therefore, participants seemed to attribute a wrong meaning to text ideas and they believed that these ideas were wrong or contradictory, and pointed them out accordingly.

Data coming from the interviews in Study 1 may help delve into subjects' behaviour (regulation of comprehension) after detecting inconsistencies in texts written in English, and how they explain them (RQ2). Some students thought that there were spelling or grammar mistakes; others misunderstood some correct ideas or incoherence was created by a lack of prior knowledge, which resulted in a new contradiction to be pointed out (this result also appeared in Study 2). Some students wrote down 'other reasons' for their non-detection/regulation since they thought there was an additional inconsistency (apart from the experimental ones). There was also a group of participants that detected the inconsistency but did not point them out. Instead, they skipped that piece of information, they held it in abeyance or they referred to their linguistic competence as the reason why they did not point out the contradiction. These regulatory types of behaviour were classified and typified, which helped to design a questionnaire of detection x regulation actions.

In Study 2, the resulting questionnaire was administered after a comprehension monitoring task. The aim was quantifying and typifying the different detection and regulatory behaviours of the sample according to their English competence. (RQ3 and 4). As expected, students with an intermediate level of English detect more inconsistencies than those with an elementary level. This is in line with results obtained in previous research work (Gómez, Devís & Sanjosé, 2013; Gómez & Sanjosé, 2012).

Regarding 'spurious detection', participants with a higher linguistic domain pointed out more mistakes of this kind. The main reason they reported was the influence of their prior knowledge on the text comprehension. It seems that they felt more confident about their linguistic knowledge and they dared to judge the text comprehensibility. On the other hand, participants with an elementary English level stated that their low linguistic knowledge led them to misunderstand the text information and to think there were other mistakes in the

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texts. This is connected to problem (b) in Section 1.2 (attribution of a wrong meaning to explicit text ideas). Although it should be contrasted in further experiments, Study 1 and Study 2 show that 'Spurious detection' may be a typical regulatory action or behaviour of EFL readers with low-intermediate proficiency. If it was to be confirmed, it would be of interest to delve into the reasons why subjects of a certain EFL competence detect spurious inconsistencies, either due to their language proficiency or prior knowledge interference.

As far as 'Detection but Inadequate regulation', students' reasons for not having pointed out the inconsistencies are also different between English levels. A1-A2s thought it was due to their English proficiency level or their lack of prior knowledge. However, intermediate students of English held the inconsistent information in abeyance and continued reading to see if the rest of the text helped to fix this information. They also reported that they just ignored this piece of inconsistent information.

Finally, regarding 'No detection, no regulation', students with intermediate levels of proficiency had more confidence in the text and they thought the text did not contain mistakes. In this case they also pointed out to their English level as a cause for not having detected the inconsistencies. This behaviour connects with Winograd and Johnston (1982), who suggested that when subjects (in L1) failed to detect the error, there could be other reasons, apart from having limited comprehension monitoring. One of them was that subjects trust the text. However, other participants of the sample pointed out other reasons. A1-A2 students reported linguistic or translation problems. In fact, around 70% said their English proficiency was not good enough and that they used translation to access meaning. Moreover, they said they did not re-read the text. This behaviour is connected to problem (d) described in section 1.2 (difficulty of building macro-ideas and establishing global coherence). Therefore, data resulting from Study 2, to be confirmed by further studies, may suggest that constant translation to L1 and no-reading of text paragraphs could be another typical behaviour of EFL readers with low language competence.

As mentioned before, low-level processes involved in language decoding are not automated in students with a low level of language competence (Koda, 2007; Perfetti, 1985; Taguchi, Gorsuch & Sasamoto, 2006). Subjects use translation to their mother tongue in order to help them understand. As observed in other research studies (Gómez, Solaz & Sanjosé, 2014; Seng & Hashim, 2006), constant translation into the subject's L1 while reading in a foreign language overloads working memory, contributing to processing difficulties, such as not being able to build coherence or link the text's macroideas. Working memory is overloaded for the overuse of translation. Therefore, there would not be free cognitive resources to perform the 'high-level' operations involved in (d) and (e) (Kozminsky & Graetz, 1986). Hence, students of the sample said they did not re-read the text to establish local or global coherence. In order to release their WM and free some resources, the reader

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may skip some text fragments (c). That is the behaviour of most intermediate students of the sample. Therefore, WM overload caused by a limited linguistic competence leads to specific monitoring difficulties.

The limited linguistic knowledge prevents subjects to build propositions correctly (that is the reason why participants attributed a wrong meaning to same text ideas); or if they are able to build the propositions, they may fail to process them in the same cycle and receive different amounts of activation (because they did not re-read the text or link ideas to establish global coherence). If one of these problems happens, propositions cannot be compared and the inconsistency or reading obstacle is not detected (Vosniadou et al., 1988). This may explain the reason why students of the sample failed to monitor their comprehension while reading in English. Connecting text ideas usually implies re-reading but, surprisingly, the third most common reason students reported for their non-detections was 'No re-reading'; therefore, they did not try to link the text ideas to construct meaning, and consequently, they could only remember the beginning (32%) or the last part of the text (11%). According to Kintsch's Construction and Integration model (Kintsch, 1988), in order to detect an inconsistency between two propositions they should be processed together in the same 'processing cycle' (in WM) and receive the same amount of activation. When students remember the beginning or the last part of the text, propositions are not given the same amount of activation. Therefore, they are not compared and the detection of the flaw does not take place.

Although some of the results obtained in Study 1 and Study 2 should be contrasted in further experiments, the design of the questionnaire may help classify and typify the most common detection and regulation actions performed by EFL readers. In turn, it may help teachers and practitioners know and delve into the reasons why students 'do what they do' when they read, and design specific reading programmes to overcome students' difficulties.

5. CONCLUSIONS

Two empirical studies were conducted to evaluate Spanish university students' comprehension monitoring and to explore their behaviour and regulatory actions when they face reading obstacles in English as a foreign language (EFL). A questionnaire accounting for monitoring and regulatory performance was designed, combining previous research work on comprehension and regulation processes and specific comprehension difficulties of low-proficient EFL users.

Replicating previous research work (Gómez, Devís & Sanjosé, 2013; Gómez & Sanjosé, 2012) Spanish university students exhibited limited comprehension monitoring skills when reading science texts in English in both studies. As expected, these students showed specific and particular evaluation and regulation behaviour when reading in a foreign

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language. When they had to judge the comprehensibility of a text, the lack of linguistic proficiency was an additional factor which interacted with readers' cognitive and metacognitive abilities. Remarkably, participants created new semantic obstacles when interpreting text information and they built inadequate meanings in correct ideas. This spurious detection was not reported in previous studies about comprehension monitoring and it was a characteristic of reading in a foreign language.

As a result of quantitative and qualitative data obtained in Study 1, a questionnaire was designed to analyse the causes of students' different monitoring behaviour and the regulatory actions they perform to solve out comprehension difficulties.

The most common reasons reported by English low-proficiency participants for their non-detection of inconsistencies or inadequate regulation were related to their poor language mastery, which led them to misunderstand the text information, overlook the contradictions, think there were other mistakes in the texts or translate constantly into their mother tongue in order to access meaning. As it has been proven in other similar previous studies (Gómez, Devís & Sanjosé, 2013; Gómez, Solaz & Sanjosé, 2014; Seng & Hashim, 2006), when subjects are reading a text in a foreign language and they need to translate information constantly into their mother tongue, almost word for word, it seems that this process overloads their working memory and, at the same time, it contributes to processing difficulties, such as not being able to link the text's macroideas or to build textual coherence. On the other hand, students with an intermediate level of English were more confident with their language proficiency and pointed out other reasons different from the linguistic ones, such as the interference of prior knowledge or the confidence that the text contained no errors.

In summary, the questionnaire reasonably accounted for the variability of the self-perceived causes of students' monitoring performance when reading in EFL and their behaviour when confronted with anomalous data. However, it should be validated in future studies using wider samples to assess its sufficiency for the data. As Karbalaei (2011) pointed out, analysing students' reading obstacles and needs is paramount in order to design specific reading programmes to train students to become effective readers.

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APPENDIX

Questionnaire on reasons for monitoring performance and regulatory actions

Please, read carefully the following statements and tick the appropriate box.

	Yes	**No**
1. I have detected and I have pointed out ALL the inconsistencies embedded in the texts		
1.1. Good comprehension. All correct.		
2. Apart from the inconsistencies embedded in the texts, **I have pointed out OTHER inconsistencies different from the embedded ones**. The reason is… (*tick the corresponding box*):		
2.1. My English level is not very good, so I have got some comprehension obstacles.		
2.2. My prior knowledge about the topic makes me understand other things. (But my English level was not a handicap)		
2.3. I have pointed out some errors on correct ideas for other reasons (*Please, Explain your reasons here*).		
3. I have detected some of the embedded inconsistencies but I haven't point them out, because… (*tick one/some of this/these reason/s*):		
3.1. I thought that my prior knowledge about the topic was not good enough and, for this reason, I believed that I was not able to understand the text properly.		
3.2. I thought that my English level was not good enough and, for that reason, I believed that I was not able to understand the text properly.		
3.3. I have placed the inconsistent information in abeyance to deal with it later and see if the text would clarify it. But later I have forgotten to point it out.		
3.4. I have assumed that it was a typo, or that further information was needed. I have been able to assume this necessary information to overcome the inconsistency and go on reading.		
4. I have not detected some/most of the embedded inconsistencies, (and therefore, **I have not pointed them out**) **because…** (*tick the corresponding box*):		
4.1. It is difficult for me to pay attention to the relationship between text ideas. When I read in English, I usually translate into my mother tongue in order to understand the text.		
4.2. Although I try to understand everything, I cannot understand some text ideas due to my poor English proficiency level. When I have read the text, I haven't understood some of the contradictory ideas, or I have misunderstood them and I haven't been able to detect the contradiction.		

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4.3. I cannot expect to understand everything due to my poor English proficiency level. That is the reason why I usually skip some pieces of information. Understanding the main idea is enough for me. Therefore, I did not notice some of the contradictory ideas.		
4.4. This is a control item. Please, write "10" in these two boxes.		
4.5. My English level is enough and I have understood all or almost all the text ideas. However, when I read in English, I do not try to establish links among ideas actively. I read one by one and, if I understood them, I do not go backwards.		
4.5.1.-In fact, when I read, I do not go backwards in the text, neither in English nor in my mother tongue.		
4.5.2.-I usually re-read in my mother tongue to link ideas, but not in English, because I get tired soon/it is harder for me to read in English than in my mother tongue.		
4.5.3.-I usually re-read in my mother tongue, but not in English, especially because I pay attention to language, and not so much to the content of the text. I do not care about coherence among text ideas.		
4.6. I usually re-read to link text ideas, but only when I need it. In this case, I felt it was not necessary because I found that everything was correct.		
4.7. When I read the text I felt I understood all the text ideas. However, I did not retain the meaning of the first ideas in the text, but only the meaning of the last ones. When I was reading the last part of the text, the former ideas did not come to my mind (I could not remember them or I thought that the first ideas were similar in meaning to the last ones) so I did not detect the contradictions.		
4.8. When I read the text I felt I understood all the text ideas. However, I did not retain the meaning of the final ideas of the text, but only the meaning of the first ones. I haven't read carefully the ideas of the last paragraph, which were a kind of summary or repetition of previous ideas. Then, I did not realize that they were inconsistent with previous text ideas, which I have understood correctly.		
4.9. I have prior knowledge about some topics. The ideas of the first part of the text are in accordance with my prior knowledge and I have understood them perfectly. Although I haven't got comprehension difficulties in English, I haven't read carefully the ideas of the last part of the text, as they seem to be repeated. Then, I haven't found anything strange.		
4.10. I haven't read carefully this time. Normally, I do it better. (*Please, write down your reasons here)*		
4.11. I have other reasons different from the aforementioned ones (*Please, write down your reasons here)*		

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