

The effects of embedded and elaborative interrogation questions on L2 reading comprehension

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Abstract

With 97 advanced second language (L2) learners of Spanish, the present study utilized domain specific texts to examine the effects of embedded “what” questions and elaborative “why” questions on reading comprehension. Participants read two different vignettes, either with or without the adjuncts, from a social psychology textbook, and then completed a written recall, multiple-choice items, and a topic familiarity questionnaire. Results revealed no significant effects of inserted adjunct questions for recall and multiple choice items. Mean recall scores for both the embedded and elaborative questions were almost the same for each passage, whereas the mean recall score for the version without adjuncts was lower. Results are discussed in light of previous research and suggestions for more research of this nature are offered.

Keywords: embedded questions, elaborative questions, L2 reading comprehension

The reconfiguration of language programs at the university has been a topic of interest for some time now (Brantmeier & Pulido, 2010; MLA, 2007). A common theme that appears across reports is the integration of reading in the curriculum from introductory to advanced levels. Some view reading as the foundation for language development (Brantmeier, 2008; Maxim, 2009), and in addition to reading authentic, literary texts, language programs are incorporating more discipline-specific study within language departments, that is, they are exposing students to texts that are written for specific subjects.

To date, the majority of second language reading research that deals with languages other than English has utilized reading passages taken from literary works that are part of the literary canon.

The language major at the university is starting to include additional courses that are tailored to the professional needs of the students, and courses such as Medical Spanish or Spanish for Lawyers are becoming part of regular elective offerings. Furthermore, for some time now, beginning and intermediate textbooks have included excerpts from science and medical journals, articles about social issues, etc. Consequently, second language research that examines the reading of domain specific materials is of timely and practical value. The present study attempts to fill a lacuna in the second language (L2) reading database by investigating the effects of two different types of embedded adjuncts on L2 reading in order to find effective ways to enhance comprehension and promote more strategic reading.

Though the topics of reading texts are changing in the L2 classroom of Spanish, reading continues to be a silent activity completed outside the classroom. This is largely due to the constraints of the syllabus, emphasis on oral skills, and limits of class hours. Therefore, the present study attempts to address an issue undertaken while reading silently—the role of inserted embedded questions in a text as a technique to heighten reading comprehension. Methods of fostering L2 text comprehension typically emphasize pre-reading activities that activate relevant knowledge, such as advanced organizers and anticipation guides (Peregoy & Boyle, 2001), and some highlight activities where instructors read a text out loud with students to model reading strategies (Singhal, 2005). Many of these exercises are carried out during class time, but the present study utilizes a technique that functions while students engage with the text silently outside of class.

Literature Review

Second Language Research on Text Type and Formats

Extensive first language (L1) research has been conducted on how varied text types affect reading comprehension (Hiebert, Englert, & Brennan, 1983; Mandler, 1978) and some L2 reading research has addressed the same phenomena (Carrell, 1984a; 1984b, 1985). The term text type usually refers to structure and organization of texts, and the most widely used text types in research have been expository and narrative prose (Alderson, 2000).

The use of analogies as an aid for L1 reading dates back to the 1980s (Vosniadou & Ortony, 1983; Rumelhart & Norman, 1981), and consequently many children's books include analogies to support children beginning to read. Analogies have also proven to be a successful tool to help adults acquire new scientific concepts (McDaniel & Donnelly, 1996). L2 research with domain specific text types has also focused on analogies that may assist L2 comprehension with adults (Brantmeier, 2005; Hammadou, 2000). The L2 investigations examined whether adding analogies to scientific passages helps unfamiliar texts become easier, with hypothesized positive effects on comprehension. With university level students of French, Hammadou (2000) found that analogies did not aid the L2 reading comprehension process. With students enrolled in university Spanish, Brantmeier (2005) utilized the same scientific passages as Hammadou but included both sentence completion and multiple-choice items, in addition to recall, to measure comprehension. Brantmeier's investigation revealed that the addition of analogies to scientific texts did not compensate for lack of prior subject knowledge as measured via all three

assessment tasks. Findings from Hammadou (2000) and Brantmeier (2005) lead to more inquiries that examine what variables may aid the comprehension of domain specific texts with L2 readers, and perhaps questions that are embedded within the text (instead of analogies) may advance the research on this topic.

Research on the absence or presence of embedded questions within L2 reading materials is sparse. In a somewhat related study, Lee and Binkowski (2009) utilized a subset of data from a past study with second language students of Spanish to analyze the effects of meaning orientation tasks on acquisition of new verb forms and L2 reading comprehension. The meaning orientation task consisted of multiple-choice comprehension questions that were answered prior to reading, and participants were also asked to verify their prior answers while they read. Results of Lee and Binkowski (2009) revealed that answering pre-reading comprehension questions is not a guarantee of increased comprehension. Recently, with intermediate level English as a Second Language (ESL) learners, Al-Shehri and Gitsaki (2010) reported that an integrated reading format, where comprehension questions were inserted within the reading text, proved to facilitate L2 reading comprehension more than a split-attention format, which consisted of reading text followed by comprehension questions. In this study the integrated reading format involved multiple-choice questions that were inserted directly into the reading texts. It is important to point out that Al-Shehri and Gitsaki (2010) utilized short, online readings for their study.

L2 Reading Research and Background Knowledge

The process of making meaning during reading varies from reader to reader. Several books that treat L2 reading research and instruction include extensive reviews of background knowledge and the L2 reading process (Grabe, 2009; Hudson, 2007; Koda, 2005), and Hudson (2007) also includes a very thorough synthesis of research on prior knowledge as a factor in the first language reading process. Investigations concerning the influence of background knowledge, also referred to as content knowledge, domain knowledge, and reader's schema, on L2 reading date back to the 1980s with investigations that included ESL and English as a Foreign Language (EFL) students of different instructional levels and language backgrounds (Bügel & Buunk, 1996; Carrell, 1984a, 1984b; Hudson, 1982; Johnson, 1981; Mohammed & Swales, 1984; Pritchard, 1990; Steffensen, Joag-dev, & Anderson, 1979). Researchers agreed that background knowledge significantly influences the comprehension of L2 reading materials. In more recent years, research has examined the effects of passage content on L2 reading of languages other than English with participants from foreign language programs in the USA (Brantmeier, 2002; Brantmeier, 2003; Schueller, 2009; Young & Oxford, 1997). As anticipated, results echo previous findings with English language learners. Given the prior research on the role of passage content in L2 reading, it is hypothesized that textual enhancement questions may aid the comprehension of domain specific texts.

First Language Research on Text Adjuncts for Reading

Extant research on strategies to improve reading comprehension in L1 indicates that various types of adjunct questions, comprehension questions that are answered during reading, can improve comprehension of the text (Callender & McDaniel, 2007; Hamaker, 1986; Peverly &

Wood, 2001; Seifert, 1993; Walczyk & Hall, 1989). Adjunct questions that are placed within the text, *embedded questions*, typically improve comprehension for L1 readers, particularly when the embedded questions are similar to or are related to the final questions used for assessment (Hamaker, 1986). The aforementioned studies utilized participants whose L1 was English, and additionally, Peverly and Wood (2001) included reading disabled students in their investigation. Additionally, prior researchers examined L1 reading comprehension with different assessment tasks. Walczyk and Hall (1989) did not use a measure of reading comprehension, and instead they asked students to self-assess their reading abilities.

L1 reading comprehension is an integrative process, during which the reader engages in various processes to construct a mental representation of the text (Kintsch, 1988). The mental representation includes several levels ranging from a surface-level representation that contains a verbatim representation of the text, to a situation model—a representation that includes prior knowledge as well as the meaning conveyed in the text. As the reader processes the text, both relevant information and irrelevant information is activated in the reader's mind. A critical task during the construction of the situation model is to determine which information is relevant, and should be included in the representation, and which information is irrelevant, and should be removed from the representation. This task is generally thought to be an automatic or unconscious process not intentionally controlled by the reader, but it is critical to the comprehension process. In fact, it is thought that this process may be an important difference between low- and high-ability readers (Gernsbacher, 1990).

Although constructing a situation model is a difficult task for some readers, text adjuncts that require the reader to answer questions about the text can improve comprehension for readers when reading a text in their first language (Callender & McDaniel, 2007; Hamaker, 1986; Peverly & Wood, 2001; Seifert, 1993; Walczyk & Hall, 1989). *Embedded questions*, adjunct questions that ask about specific concepts stated in the text (“what questions”) can be answered by information solely stated in the text (Callender & McDaniel, 2007; Hamaker, 1986). Low-ability readers in particular are aided by embedded questions because they cue or orient the reader to important information in the text (Callender & McDaniel, 2007). The questions allow the reader to focus on the important information and use it as the basis of their mental representation. Because the reader is aware of the important information in the text, the questions may also facilitate the automatic process that removes the irrelevant information from the mental representation leaving the reader with a more coherent mental representation of the text.

L1 reading comprehension includes moving beyond understanding the information that is stated in the text itself to activating relevant prior knowledge to fill in the gaps that are ubiquitous in text (Hudson, 2007; O'Reilly & McNamara, 2007). Prior knowledge that is activated during reading allows the reader to generate inferences and to clarify aspects of the text that are not explicitly stated. Inferences are difficult to generate, and one reason why readers fail to generate inferences is that they fail to activate *relevant* prior knowledge (Hannon & Daneman, 2001). Accordingly, text adjuncts have also been developed that are aimed at prompting the reader to activate prior knowledge, which results in a more coherent mental representation of the text.

One such adjunct, Elaborative Interrogation (EI), is a type of questioning technique that prompts the reader with “why” questions, as opposed to the “what” questions typical of embedded

questions. Whereas embedded questions (as described above) generally target specific facts within the text, requiring the reader to answer what a specific concept or idea is, elaborative interrogation, requires the reader to go beyond the text and activate prior knowledge in order to answer *why* a specific fact is true or why a particular phenomenon occurs. Initial research on EI indicated that it is effective with fact-learning (Martin & Pressley, 1991; Pressley, McDaniel, Turnure, Wood & Ahmad, 1987; Woloshyn, Pressley & Schneider, 1992) and with short prose passages (Seifert, 1993). It is important to note that the majority of studies investigating EI have included a training phase, during which learners were instructed how to answer the *why* questions (Woloshyn et al., 1992) and in some cases feedback was provided on how to improve their answers (Martin & Pressley, 1991). When training and feedback was provided, EI significantly improved memory. However, most of the studies investigating EI that utilized such training were studies of memory for basic facts or short prose. Few studies have utilized EI with expository passages, particularly domain-specific texts.

The studies that have investigated the effectiveness of EI with expository text have produced mixed results (Callender & McDaniel, 2007; McDaniel & Donnelly, 1996; Ozgungor & Guthrie, 2004; Seifert, 1993), indicating that the benefits of EI may depend on the text, the reader's ability (Callender & McDaniel, 2007) or the reader's interest in the text (Ozgungor & Guthrie, 2004). Importantly, the EI questions did benefit readers even when no training on answering EI questions was provided within the experimental setting (see Callender & McDaniel, 2007). The mixed results could be due to other factors, for example, Seifert (1993) suggested that EI may be less effective with prose because the surrounding text elaborates on the concepts. This built-in elaboration reduces the need for additional elaboration, although this explanation has not been entirely supported. EI may be particularly useful when reading in a foreign language due to the added difficulty of reading in L2. It is possible that readers may not spontaneously activate prior knowledge (as they might when reading in their L1) thereby necessitating text adjuncts that prompt the reader to engage in higher-level processes—such as knowledge activation—that are critical to creating a coherent mental representation of the text.

Research Question

The following overall research question guides the present study:

1. With domain specific L2 texts, do embedded questions influence text comprehension as measured via written recall and multiple-choice?

Participants

The final participant group consisted of 97 students, 26 men and 71 women, ages 19–22. All participants were enrolled in an advanced level Spanish grammar and composition course at a mid-sized, private university in the United States. This course marks the first course toward a major in Spanish and is the first in a two-course sequence taken immediately before entering the upper level linguistic and literature courses. During the course students are assigned to read authentic literary works including short stories, essays, and prose. At the university, students are

not obliged to take language courses and anyone can choose to study languages. Consequently, all students enrolled in the course voluntarily.

The original data pool consisted of 114 participants. Only those students with the following criteria were included in the final data analysis: (1) students who achieved the appropriate composite score on the computer-based test (tested and placed into Advanced Spanish), (2) students whose native language was English, and (3) students who completed all tasks during data collection. The present study utilized a convenience sample of participants.²

Methods and Procedures

Data Collection Procedures

First, all participants completed a computer-based reading test. Approximately three weeks later, the same students participated in an investigation during regular class time during the 10th week of class. During a regular class period of 50 minutes, all participants completed the following instruments in this order for each separate reading: reading passage, written recall, multiple-choice questions, and topic familiarity questionnaire.

No details about the experiment were provided to participants. No participants declined to participate in the study. The researcher and/or a research assistant along with all instructors for the courses were present during data collection sessions to ensure that students did not look back at any previous pages while reading and completing all tasks.

Reading Section for Computer-Based Test

Prior research has found that learners from advanced levels of Spanish language instruction may not be reading at the advanced levels (Brantmeier, 2008; Brantmeier & Dragiyski, 2009). Placement exams for the university traditionally include all four skills, and therefore low-achievement readers may be placed into the advanced courses because they achieve high overall test scores. Given prior findings of low reading levels with advanced language learners, a critical component of the present study was to determine whether learners in the advanced Spanish courses were reading at the same levels. All participants completed a pre-test that consisted of an online exam taken from their home computer approximately three weeks before the in-class data collection period. This pre-test was developed by instructors at the university. The computer-based test included 8 different readings in Spanish of varying styles and lengths (between 100 and 200 words for each reading). Topics and styles involved the following: daily lives of students, historical vignettes, a poem, personal narratives, and encyclopedia-like readings. Comprehension was measured via multiple-choice items with four possible answers: one correct response and three distractors, and all distractors were plausible (Alderson, 2000; Bernhardt, 1991; Wolf, 1993). Some questions included inferential items. All multiple-choice questions were written in Spanish, and the highest possible score was 30.

Figure 1 illustrates the distribution of scores for reading on the diagnostic exam. Surprisingly, only 17 out of the 114 original participants in the study scored 15 or lower correct out of 30, and

86% of the participants achieved a score above 15. After controlling for a homogeneous population of students, 97 students were part of the final data analysis. Approximately 92% of these participants scored above 15, and about 85% of these students scored higher than 22 out of 30 on the reading exam.

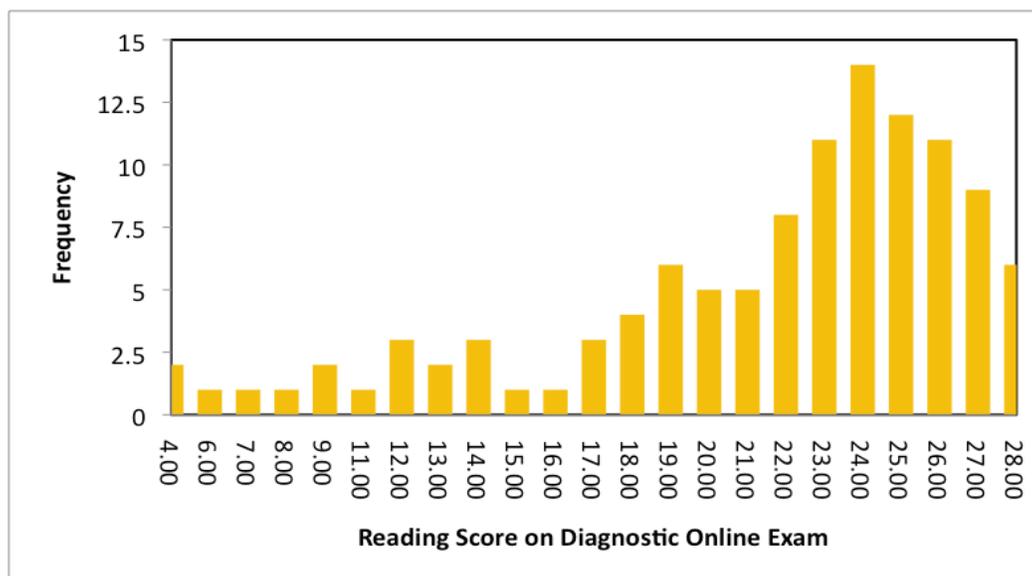


Fig. 1 Distribution of scores for reading on diagnostic exam

Given the lack of differences in ranges with the comprehenders in the final group of participants (average score of 73%), grouping into low and high comprehenders was impossible for this study. It could be said, then, that the participants in the present study performed equally well on the reading diagnostic exam and were average to above-average L2 readers.

Reading Passages and Embedded Questions

The reading passages for the in-class experiment were taken from a university level Social Psychology textbook (Callender & McDaniel, 2007). In the L1 study, Callender and McDaniel (2007) utilized a passage containing 8,700 words. For the present study, sections of the passage were utilized, and the final condensed version consists of approximately 1,200 words total. The first reading passage was about first impressions, the primacy effect, and schemas. The second reading passage was about implicit personality theories with a detailed explanation of attribution theory. Sentence complexity may influence reading comprehension, as longer sentences may be more difficult to read than shorter clauses. Therefore, each passage was examined for factors of text difficulty that included passage length, total number of sentences, and total number of embedded clauses. Table 1 lists text difficulty factors for each passage.

Table 1. *Text difficulty by passage*

Passage content	Length (words)	Number of sentences	Number of embedded clauses
Passage One: first impressions, the primacy effect, and schemas	525	21	15
Passage Two: implicit personality theories with a detailed explanation of attribution theory	646	22	16

As indicated in the table, the first passage concerning first impressions, the primacy effect, and schemas included about 120 less words than the second passage concerning implicit personality theories and attribution theory. The passages contained almost the same number of sentences and embedded clauses. In summary, the main differences between the two passages were passage content and length.

There were three different versions of each reading passage. For Reading Passage One, Version One included embedded “why” questions (EI), Version Two included standard embedded “what” questions (EQ), and Version Three did not include any embedded questions. For Reading Passage Two, Version One included embedded “why” questions, Version Two included standard embedded “what” questions, and Version Three did not include any embedded questions. Appendix A includes the reading passages along with the inserted questions for each version.

Two embedded questioning techniques, EQ and EI, were utilized in this study. Two parallel sets of questions were constructed for each text, one set included “What” questions (EQ) and one set included “Why” questions (EI). The questions addressed main ideas and concepts that were presented in the text. For example, the first text, which was about first impressions and the primacy effect, included questions such as “What is the primacy effect?” (EQ) and “Why is the first information about a person the most memorable? (primacy effect)” (EI). All texts and adjunct questions were presented in Spanish. A between-subjects design was used, with either EQ, EI questions, or no questions (control condition). There were 2 questions per passage, and the questions were placed after every two or three paragraphs.

As participants read through the text, they encountered the questions. Because the experiment investigated reading in a foreign language we wanted to prevent this manipulation from being a test of writing (Alderson, 2000). Thus, participants were instructed to pause to consider the answer to each question as each question was encountered. A space was provided after each question, and even though students were not specifically instructed to write down the answer, all subjects used the space provided to write an answer.

Assessment Tasks for Classroom Performance

A variety of assessment tasks are needed to measure L2 reading comprehension (Alderson, 2000; Bernhardt, 1991), and consequently, for the present study two different assessment tasks were utilized: written recall and multiple-choice.

The written recall task offers the purest depiction of comprehension, as tester interference and retrieval cues do not exist (Bernhardt, 1991). For the present study, the written recall was completed immediately after reading the passage. Instructions asked the reader to recall and write down as much as they could of what they had just read without looking back at the passage (Bernhardt, 1991; Brantmeier, 2002; Lee, 1986; Young & Oxford, 1997). The written recall was completed in the reader's native language (Alderson, 2000; Bernhardt, 1991; Lee & Ballman, 1987; Wolf, 1993) to avoid a test of writing instead of reading.

Different scoring rubrics for the recall task include idea units, propositional units, pausal units, and so forth (Brantmeier, 2002; Lee, 1986). Research has shown that the pausal unit is the most effective (Bernhardt, 1991; 2011). A pausal unit is a unit or entity that during normally paced oral reading has a pause on each end of it (Bernhardt, 1991), and each pausal unit represents a unit for scoring. The present study utilizes the pausal unit protocol. Four native speakers of Spanish read the passage out loud for the initial division of pausal units, and then a matrix of possible pausal units was established for each passage. Following this, the written recalls for each participant were checked for the presence or absence of such units. The total number of correct pausal units was utilized for the written recall score. For Passage One the total number of pausal units was 33, and for Passage Two the total number of pausal units was 40. As detailed in Bernhardt (1991) and directly stated again in Bernhardt (2011), a recall of approximately 50% of the pausal units is considered a high-level achievement.

Multiple-choice questions are the most popular means of assessing reading comprehension, and answers are either right or wrong. For each of the multiple-choice questions, four possible responses were created (Alderson, 2000; Bernhardt, 1991; Wolf, 1993) with one correct answer and three plausible distractors. In addition, another provision was also included: test-takers were not able to determine correct responses by looking at the other questions on the page. The multiple-choice instrument was written in English. For Passage One the total possible score was 9, and for Passage Two the total possible score was 11. See Appendix A for an example of multiple-choice items. The multiple-choice items were written in English.

Topic Familiarity

A topic-familiarity questionnaire was completed by all participants. Topic familiarity was assessed via questions with five possible choices ranged from 1 (*I was really familiar with this topic*) to 5 (*I was not familiar with this topic at all*).

Results

Topic Familiarity

For both passages read, participants reported their degree of familiarity with the passage topic on a five-point scale (really familiar to not familiar at all). Again, the lower the mean score the more familiar the subjects were with the passage topic. For Reading Passage One, which was about first impressions, the primacy effect, and schemas, participants reported being somewhat familiar with the topic of the passage ($M = 2.65$, $SD = .90$). For Reading Passage Two, which discussed

implicit personality theories and attribution theory, participants reported approximately the same degree of familiarity, somewhat familiar with the topic of the passage ($M = 3.24$, $SD = .98$). Overall, these findings indicate the participants were equally and somewhat familiar with both passages.

Given prior L2 reading research that reported significant differences by gender for topic familiarity ratings (Brantmeier, 2004; 2005; 2006), the present ratings were also examined for variation between men and women for each passage. For Reading Passage One, male participants reported being somewhat familiar with the passage ($M = 2.8$, $SD = .98$) and so did their female counterparts ($M = 2.6$, $SD = .87$). For Reading Passage Two, male participants indicated being somewhat familiar with the topic ($M = 3.4$, $SD = .91$) and so did female participants ($M = 3.2$, $SD = 1.00$). Results of the Kruskal Wallis test indicated no significant differences by gender for self-reported topic familiarity ratings for both of the reading passages ($p > .05$). Findings indicate that men and women reported being equally familiar with both passage topics utilized for the present study.

Passage One: Embedded Questions, No Questions, and Assessment Task¹

For Reading Passage One (first impressions, primacy effect, and schemas), sample means and standard deviations for the main effect of type of embedded question or no embedded question on both comprehension assessment tasks were calculated. Table 2 lists means and standard deviations for Passage One by embedded question type (why, what, or no question) and assessment tasks (recall and multiple-choice).

Table 2. *Descriptive statistics for Passage One by embedded questions and comprehension assessment tasks*

	Embed question type	Mean	SD	N
Recall Passage One	Embed Why	19.42	9.03	36
	Embed What	20.07	12.30	28
	No Embed	17.97	8.59	33
	Total	19.11	9.88	97
Multiple-choice Passage One	Embed Why	8.33	0.79	36
	Embed What	8.21	0.92	28
	No Embed	8.27	0.91	33
	Total	8.28	0.86	97

Findings reveal higher recall scores for the version with embedded “why” and “what” questions than for the version with no embedded adjuncts. For all three versions of the reading, participants achieved the same multiple-choice score. As listed in Table 3, results of the ANOVA showed no significant differences among mean scores for embedded question type or no embedded question for recall and multiple-choice ($p > .05$).

Table 3. *Between Subjects ANOVA for Recall, Multiple-choice, and Embedded Question Type for Passage One*

Test of Between-Subjects Effects							
Source	Dependent variable	Type III Sum of Squares	<i>Df</i>	Mean Square	<i>F</i>	Sig.	Partial Eta Squared
Corrected model	Recall	72.18 ^a	2	36.09	0.37	0.70	0.01
	MC	.23 ^b	2	0.11	0.15	0.86	0.00
Intercept	Recall	35197.98	1	35197.98	355.55	0	0.79
	MC	6568.04	1	6568.04	8664.02	0	0.99
RdgOne	Recall	72.18	2	36.09	0.37	0.69	0.01
	MC	.23	2	0.11	0.15	0.86	0.00
Error	Recall	9305.58	94	98.99			
	MC	71.26	94	0.76			
Total	Recall	44814.00	97				
	MC	6719.00	97				
Corrected Total	Recall	9377.75	96				
	MC	71.49	96				

Note. ^a R Squared = .008 (Adjusted R Squared = -.01), ^b R Squared = .00 (Adjusted R Squared = -.02)

Passage Two: Embedded Questions, No Embedded Question, and Assessment Tasks

For Reading Passage Two (implicit personality theory and attribution theory), sample means and standard deviations for the main effect of type of embedded question on both comprehension assessment tasks were calculated. Table 4 lists means and standard deviations for Passage Two by embedded question type (why, what, or no question) and assessment tasks (recall and multiple-choice).

Table 4. *Descriptive statistics for Passage Two by embedded questions and comprehension assessment tasks*

	Embed question type	Mean	SD	N
Recall Passage Two	Embed why	11.70	6.05	36
	Embed What	12.46	8.19	28
	No Embed	9.79	6.04	33
	Total	11.27	6.75	97
Multiple-choice Passage Two	Embed why	7.00	1.57	36
	Embed What	6.50	1.29	28
	No Embed	6.18	1.84	33
	Total	6.58	1.62	97

Results of the ANOVAs demonstrated no significant differences among mean scores for all three embedded question types and both assessment tasks ($p > .05$). Findings are indicated on Table 5.

Table 5. *Between Subjects ANOVA for Recall, Multiple-choice, and Embedded Question Type for Passage Two*

Test of Between-Subjects Effects							
Source	Dependent variable	Type III Sum of Squares	<i>Df</i>	Mean Square	<i>F</i>	Sig.	Partial Eta Squared
Corrected model	Recall	118.91 ^a	2	59.46	1.31	0.27	0.03
	MC	11.76 ^b	2	5.88	2.30	0.10	0.05
Intercept	Recall	12286.06	1	12286.06	271.22	0	0.74
	MC	4130.00	1	4130.00	1718.20	0	0.95
RdgTwo	Recall	118.91	2	59.46	1.31	0.27	0.03
	MC	11.76	2	5.88	2.30	0.11	0.05
Error	Recall	4258.12	94	45.30			
	MC	239.91	94	2.30			
Total	Recall	16693	97				
	MC	4448	97				
Corrected Total	Recall	4377.03	96				
	MC	251.7	96				

Note. ^a R Squared = .03 (Adjusted R Squared = .006), ^b R Squared = .05 (Adjusted R Squared = .03)

Comparison of Passages One and Two

In a comparison of performance on both comprehension assessment tasks, sample means indicate better performance with all three versions of the passage concerning impressions, the primacy effect, and schemas, than on all three versions of the second passage about implicit personality theories with a detailed explanation of attribution theory. For example, overall participants scored higher with the written recall for Passage One ($M = 19/33$; 58%; $SD = 9.9$) than Passage Two ($M = 11/40$; 28%; $SD = 6.8$). In a comparison of performance on multiple-choice items for Passage One and Passage Two, participants also scored higher with Passage One ($M = 8.3/9$; 92%; $SD = .86$) than Passage Two ($M = 6.6/11$; 60%; $SD = 1.6$). Overall, findings show that with all three versions of the reading passages, participants scored higher on Passage One.

A comparison of the standard deviations with recall for Passage One and Passage Two shows that Passage One has higher deviations, indicating that the recall scores of Passage One are more spread apart or dispersed than those for Passage Two. The opposite holds true for standard deviations with multiple-choice, as Passage One has slightly lower standard deviations than Passage Two.

Discussion

Passage One and Passage Two consisted of almost the same number of total sentences and embedded clauses, yet participants scored higher on all comprehension tasks for all versions of Passage One. The two main differences between the passages were length and content. Passage One contained 121 less words than Passage Two, yet the authors inserted the same number of embedded adjunct questions in each passage. Perhaps the higher recall for Passage One could be partially explained by length and the possibility that Passage Two needed an additional adjunct

question to account for the difference in text length. With intermediate level ESL participants, Al-Shehri and Gitsaki (2010) used a four-paragraph text that consisted of 262 words total, and they included five different multiple-choice questions that were inserted within the passage. A future study with advanced learners should examine whether the insertion of a third adjunct question in the longer passage (Passage Two) would yield different findings. Perhaps advanced learners who are reading at average and above-average levels will benefit from more adjunct questions in longer passages that contain domain specific content.

The passage content difference between the two passages in the present investigation is another factor worthy of discussion. Participants indicated being “somewhat” familiar with both passages, yet they scored higher comprehension scores with the passage about first impressions, the primacy effect, and schemas. Perhaps the learners were better able to organize knowledge and guide recall with the first passage because the inserted questions appeared after a briefer excerpt. The reliance on reader prior knowledge may decrease with more adjunct questions within the text. Prior research indicates that students perform better on readings with familiar topics than on reading with low familiarity, but the participants in the present study did not indicate high or low familiarity with either topic. A future study should utilize a more complex and sophisticated measure of background knowledge and topic familiarity. The present study used one class period for data collection. Consequently, the researchers had to minimize questions and relied on one question for topic familiarity.

Prior L1 research indicates that EQs are answered by drawing information directly from the text, whereas EI questions may require the reader to think more deeply about the concept and draw on prior knowledge to answer the question (Callender & McDaniel, 2007; Seifert, 1993). L1 research has shown that the benefits of study adjunct depend on text characteristics and topic. Prior research has also indicated that learners’ characteristics are also found to interact with adjuncts, and these variables are related to intelligence or reading ability (see Callender & McDaniel, 2007). There was little variability in comprehension ability in the sample tested in this study, as the distribution was skewed such that most participants were high-ability readers. There were no differences between the experimental groups and the control group on the multiple-choice questions, as all groups performed quite well, with all groups averaging over 90% correct. Recall tasks, however, are more sensitive to differences in the meaning extracted from the text and included in the reader’s mental representation (Graesser, Millis, & Zwaan, 1997). Thus, it is not surprising that recall, over multiple-choice, is the task that revealed mean differences between the groups, though these differences were not significant. Interestingly, both EQ and EI questions improved performance, albeit non-significantly, on the recall task.

The findings of the present study can also be connected to those from L2 reading studies that investigated the effects of a different types of study adjuncts that are utilized during the reading process, such as pre-reading questions (Lee & Binkowski, 2009), integrated and split-attention questions (Al-Shehri & Gitsaki (2010), and the inclusion of analogies (Brantmeier, 2005; Hammadou, 2000). Lee and Binkowski (2009) found no positive effects on comprehension for pre-reading questions, but Al-Shehri and Gitsaki (2010) reported positive effects for integrated questions. Both Hammadou (2000) and Brantmeier (2005) found that analogies did not help readers with comprehension, and in fact, Brantmeier postulated that with advanced L2 learners with poor L2 reading diagnostic scores, analogies may make the interactive process of L2

reading more difficult. The added analogies included more lexical items and more syntactic processing, as they were connected discourse level insertions. The present study utilized embedded questions that included lexical items from the readings, and these questions consisted of one complete phrase. So, it cannot be said that the added embedded questions made the reading process more complex at the linguistic level or with lexical processing in the present study. Similar adjuncts should be tested with below-average readers to explore whether or not embedded questions have positive effects on L2 comprehension.

Additionally, it would be interesting to utilize the same scientific texts from Hamadou and Brantmeier's studies to investigate if inserted questioning techniques have the same results with texts from a different domain. Future studies could also address the type of adjunct question more thoroughly and include multiple-choice inserts like Al-Shehri and Gitsaki (2010). It is clear that the benefits of reading adjuncts depend on a number of different factors including characteristics of the text such as length and content, how the adjunct questions are implemented (if the questions are placed before, during, or after the text), and learner characteristics such as reading ability. These factors may also interact such that high-ability L2 readers require one type of adjunct and low-ability L2 readers require another type of adjunct. Adjuncts that are highly effective in L1 may not be effective in L2, and the reverse may be true. Text comprehension is complicated and requires the successful execution of many different processes, any of which can fail. It is possible that these processes, with the use of adjuncts, may be carried out differently in L1 and L2 such that one process may be successful in L1 but not in L2. This would necessitate different text adjuncts for L2 than for L1. It is critical to continue to evaluate various text adjuncts to determine which adjuncts reliably improve comprehension in L2.

In the present study, students were not required to write down an answer to the adjuncts, but it is interesting to note that all subjects in the present study did write down their thoughts in the space provided. Participants were instructed to stop at each question and answer it by thinking about the answer. Previous research on question adjuncts typically requires participants to write down their answers to the questions (see Hamaker, 1986). A future experiment should examine the differences in comprehension for inserted questions that require written answers and those that do not allow space to write an answer. Also, a closer look at the packets for the present study reveals that almost all the students used English (L1) to write down their answer, which attends to the issue of testing reading instead of writing. Unfortunately, and perhaps due to the fact that students were not required to write down answers, many of the written responses were not legible and thus the authors could not analyze the content of the responses. It appeared as if students were writing for themselves, and not for a researcher to read. A limitation of this study is that participants were asked to think about the questions that were inserted into the text instead of writing down the answer (as is typically done). Future studies should examine the differences between thinking about inserted EI and EQ questions and writing answers for EI and EQ questions. It may prove better for L2 participants to write the answers to EI and EQ questions instead of thinking about them. Perhaps then the adjunct questions produce a more general benefit on written recalls. Future studies should also examine the outcomes of training on the effectiveness of EI. It is possible that in the current study readers did not effectively activate enough prior knowledge to make EI universally beneficial. Many L2 instructors who teach reading use class time to activate prior knowledge, and additionally, instructor feedback on the quality of the responses to EI questions may be beneficial for L2 readers.

Conclusion

Results of the present study build on prior research and serve as a foundation for future research that specifically explores the effects of embedded question type on different types of assessment tasks. The researchers noted specific directions for future research along with limitations of the present study. Future research should be conducted to further assess how various study adjuncts can improve L2 comprehension, and how these adjuncts interact with text and learner characteristics as well as method of assessment.

Notes

1. Table 1 depicts the difference in length for each passage selected for the present study. While creating data collection instruments it was difficult to select complete vignettes from the social psychology readings that were equal in length, and therefore, because the learners in the present study are enrolled in a course that begins the Spanish major, the decision was made to treat the texts separately in the present study. The longer text (passage two) may be more difficult to read for learners at the stage of acquisition.

2. It was impossible to select either a random or a systematic non-random sample for the present study. Data needed to be collected during regular class hours, and the researchers were only given one 50-minute class period to conduct the study. Due to time constraints, no test of first language literacy was completed, and therefore L1 literacy knowledge is not factored out in the present study. Furthermore, the researchers did not have access to L1 reading scores from the ACT or SAT exams.

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Appendix

Reading One

Primeras impresiones

Las primeras impresiones, que desempeñan un papel importante en las percepciones sociales, son las opiniones iniciales que nos formamos de las personas. Es más probable que nos formemos estas opiniones de los demás de manera rápida, basándonos en las primeras impresiones, que formarlas hasta que tengamos más información. Estas primeras impresiones pueden cambiar en la medida en que vayamos conociendo mejor a la persona, pero frecuentemente tendemos a respetarlas aun en la presencia de pruebas contradictorias. De este modo, las opiniones iniciales pueden tener un fuerte impacto sobre nuestras futuras relaciones interpersonales.

Por ejemplo, si durante una fiesta llegas a conocer a un nuevo inquilino, residente en el mismo edificio que tú, que parece ser ruidoso y egoísta, es probable que te sea difícil percibirle como una persona sensible y comprensiva al verle más tarde consolando a un niño pequeño que se acaba de raspar la rodilla. La primera información que recibimos sobre una persona frecuentemente resulta la más importante, fenómeno conocido como el efecto de la primacía.

Este efecto fue demostrado durante un experimento en el cual dos listas de características personales fueron leídas a dos diferentes grupos de participantes (Asch, 1946). En uno de los grupos, los participantes escucharon una descripción que primero enumeró las características positivas (tales como 'inteligente' y 'trabajador') y después las negativas ('impulsivo', 'obstinado', etcétera). Su evaluación general de esta persona fue positiva. Los participantes del otro grupo escucharon la misma lista, pero siguiendo un orden inverso. Los resultados indicaron que sus evaluaciones fueron mucho más negativas.

CONSIDERA LO SIGUIENTE:

1. ¿Por qué es la primera información sobre una persona la más memorable (efecto de la primacía)? (EI)
¿Qué es el efecto de la primacía? (EQ)

Esquemas

Los esquemas son formulaciones conceptuales que usamos para darle sentido al mundo. El concepto de esquemas ayuda a explicar cómo percibimos a las personas a las que llegamos a conocer. Por ejemplo, puedes poseer esquemas de los abogados como agresivos e inteligentes y de los profesores como estudiosos y un tanto introvertidos. Los sociopsicólogos refieren a estos razonamientos generalizados sobre determinadas clases de personas como esquemas de personas.

Los esquemas de personas proporcionan una estructura que posibilita evaluar a la gente a la que llegamos a conocer, permitiéndonos tomar atajos al concentrarnos en algunos hechos e ignorar otros. Cuando evaluamos a los demás por primera vez, tendemos a percibir solo la información que coincide con nuestros esquemas preexistentes, ignorando todo lo demás. Este proceso es cognitivamente eficiente, aunque, desafortunadamente, no siempre es el modo más correcto de formar impresiones (Brigham, 1986).

Una vez que situemos a una persona dentro de un esquema, tendemos a utilizar este esquema como un principio organizador general para la interpretación de toda la información posterior sobre esta misma persona. Por ejemplo, si nuestra primera impresión de un nuevo vecino es la de una persona poco amistosa, tendemos a evaluar su falta de comentario sobre nuestro nuevo coche como otra prueba de su poca sociabilidad. Si, más tarde, esta persona actúa de modo que no concuerda con el esquema (por ejemplo, si recoge nuestra basura después de que ésta ha sido dispersada por una tormenta), es probable que descartemos lo observado concluyendo que la persona ha recogido la basura con motivos de proteger a su propio césped de la basura que puede llevar el viento.

CONSIDERA LO SIGUIENTE:

1. ¿Por qué los esquemas influyen cómo percibimos a las personas a las que llegamos a conocer? (EI)
¿Cómo influyen los esquemas la manera en que percibimos a las personas a las que conocemos? (EQ)

Reading Two

Teorías de la personalidad implícita

Así como los esquemas de las personas nos guían cuando evaluamos a las personas partiendo de categorías preexistentes, de la misma manera hacemos suposiciones implícitas sobre las características de personalidad que normalmente van juntas. Por ejemplo, si llegamos a conocer a una persona que percibimos como inteligente, es probable que supongamos que esta persona es también hábil e imaginativa. Estas suposiciones sobre cómo las características están relacionadas entre sí en las personalidades de las personas se denominan teorías de la personalidad implícita (Bruner & Tagiuri, 1954; Cantor & Mischel, 1979). Es probable que no siempre seamos conscientes de gran parte de nuestras suposiciones implícitas. No obstante, puesto que estas asociaciones pueden ser firmemente enraizadas en nuestras mentes, es probable que ellas se activen a la hora de llegar a conocer a las personas por primera vez.

Nuestras teorías de la personalidad implícita están frecuentemente organizadas alrededor de características centrales, características que solemos asociar con muchas otras características. Por ejemplo, mucha gente asocia la característica de la frialdad con las de poca sociabilidad, falta de sentido de humor y falta de popularidad. Una sola característica central puede desempeñar un papel importante en la organización de nuestras teorías de la personalidad implícita sobre los demás. En un estudio, Solomon Asch (1946) mostró a dos grupos de participantes una lista de siete características que describían a una persona hipotética – cariñoso frente frío –; la diferencia de característica influyó significativamente la percepción de los participantes. Los que habían sido proveídos con una lista que incluía cariñoso tendían a percibir a la persona hipotética como generosa o con buen sentido de humor, a diferencia de los

participantes cuya lista contenía la palabra frío.

Los psicólogos usan el término efecto de halo para describir nuestra tendencia a inferir, a partir de nuestra percepción, otras características positivas (o negativas) de una sola característica central. El efecto de halo fue demostrado en un estudio donde los participantes observaron dos versiones de una entrevista con un profesor belga en la cual éste se presentó primero agradable y después desagradable. Los participantes no solo prefirieron a la persona ‘agradable’ de la entrevista, sino que también respondieron de forma más positiva a las cualidades aparentemente no relacionadas, tales como su acento y su apariencia física (Nesbett & Wilson, 1977).

CONSIDERA LO SIGUIENTE:

1. ¿Por qué hacemos presuposiciones implícitas de otras ‘personalidades’? (EI)
¿Qué son las suposiciones implícitas? (EQ)

Atribuyendo causas a los comportamientos

Un papel importante en las percepciones sociales desempeñan las opiniones que nos formamos tratando de explicar por qué las personas se portan como se portan. Nuestras respuestas hacia las personas están fuertemente influenciadas por estas atribuciones y nosotros constantemente estamos intentando comprender la razón que motiva las acciones de las personas, entender sus actitudes y las características de su personalidad y, ultimadamente, ganar control sobre nuestras futuras interacciones con ellas a través de nuestra elevada habilidad de predecir sus comportamientos.

De acuerdo con la teoría de la atribución (Heider, 1958; Jones, 1979; Kelley, 1971; Ross & Fletcher, 1985), tendemos a atribuir los comportamientos de las personas bien a causas de disposición (internas), tales como los estados motivacionales o las características de la personalidad, bien a causas externas, tales como el ambiente o los factores situacionales. Esta distinción puede tener efectos importantes sobre nuestra relación con las personas. Por ejemplo, imagínate que acabas de empezar a salir con alguien quien te gusta mucho y los dos pasáis el fin de semana en la casa de los padres de tu pareja. Para tu gran sorpresa, tu pareja actúa como una persona diferente: reservada, impersonal y físicamente indiferente. ¿Qué es lo que ha causado el cambio? Si lo atribuyes a factores externos (que tu pareja está incómoda delante de sus padres) es probable que sientas que tu relación con la persona está en grave peligro. No obstante, si atribuyes el cambio a causas internas (que tu pareja ya no te responde como antes), puede que empieces a reevaluar seriamente esta relación.

CONSIDERA LO SIGUIENTE:

1. ¿Por qué hacemos atribuciones? (EI)
¿Qué son las atribuciones? (EQ)

Example of Multiple-Choice Items for Passage Two:

1. According to Implicit Personality Theories, if we perceive someone as aggressive, we will assume that they are:
 - a. also loud and rude**
 - b. in a frustrating situation
 - c. interacting with an aggressive person
 - d. always aggressive

2. According to Implicit Personality Theories, if you meet someone who you perceive as being social, you may also expect them to be:
 - selfish and uncaring
 - humorous, warm, and popular **
 - aloof, closed, and exclusive
 - mischievous and mean

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