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# *The effectiveness of visual input enhancement on the noticing and L2 development of the Spanish past tense*

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### Abstract

Textual manipulation is a common pedagogic tool used to emphasize specific features of a second language (L2) text, thereby facilitating noticing and, ideally, second language development. Visual input enhancement has been used to investigate the effects of highlighting specific grammatical structures in a text. The current study uses a quasi-experimental design to determine the extent to which textual manipulation increase (a) learners' perception of targeted forms and (b) their knowledge of the forms. Input enhancement was used to highlight the Spanish preterit and imperfect verb forms and an eye tracker measured the frequency and duration of participants' fixation on the targeted items. In addition, pretests and posttests of the Spanish past tense provided information about participants' knowledge of the targeted forms. Results indicate that learners were aware of the highlighted grammatical forms in the text; however, there was no difference in the amount of attention between the enhanced and unenhanced groups. In addition, both groups improved in their knowledge of the L2 forms; however, again, there was no differential improvement between the two groups.

*Keywords:* input enhancement; eye tracking; attention; L2 reading; L2 Spanish

## 1. Introduction

Multiple pedagogic techniques are used in focus on form instruction, in which attention is drawn briefly to linguistic items while learners are engaged in larger, meaning-focused activities (Doughty & Williams, 1998; Ellis, 2001; Loewen, 2011; Long, 1991, 1996; Long & Robinson, 1998; Williams, 2005). As such, focus on form is argued to combine necessary components for second language (L2) learning, including input and learners' psychological processes, such as attention (Long, 1996). Some focus on form techniques, such as metalinguistic corrective feedback (e.g., Ellis, Basturkmen & Loewen, 2006) and dictogloss (e.g., Swain & Lapkin, 1998), are relatively explicit in how they draw attention to form. Other techniques such as recasts (e.g., Loewen & Philp, 2006; Nicholas, Lightbown & Spada, 2001) and input flood (e.g., Loewen, Erlam & Ellis, 2009) are less explicit. Indeed, one of the debates regarding focus on form concerns the optimal level of explicitness (Loewen, 2011; Norris & Ortega, 2000, among others). Regardless of the outcome of such debates, it is generally agreed that the visual manipulation of written input is a relatively implicit type of focus on form. However, rather than theorizing about the level of explicitness of a focus on form technique, it is preferable to explore the issue empirically by employing various measures of attention, noticing, and/or awareness. Furthermore, it is important to investigate the effects of such techniques on L2 development.

## 2. The case for text manipulation

Given the importance of attention and awareness for second language acquisition, studies within the focus on form framework have explored different ways of drawing learners' attention to L2 linguistic forms, with methods varying in their degree of explicitness. One implicit focus on form technique is input enhancement which involves manipulating the input, either oral or written, in subtle ways. Visual input enhancement is carried out through modifying the physical appearance of specific elements within a text with typographical cues such as bolding, underlining, CAPITALIZING, *italicizing*, coloring, using different fonts, and different sizes, or a combination of these features (Lee & Huang, 2008; Sharwood Smith, 1993; Simard, 2008). Additionally, it should be noted that while it is possible to enhance both grammatical and lexical structures in a text, it is grammatical features that have received the majority of attention in SLA studies of visual input enhancement (Lee & Huang, 2008). Textual modifications have the potential to enhance the saliency of the targeted linguistic forms, which may increase the likelihood of learners attending to the form, which in turn may result in L2 development. However, as Sharwood Smith (1991) noted "whether

the enhanced input will ultimately trigger the relevant mental representation is . . . an empirical question" (p. 120).

A number of studies have been conducted on the effects of visual input enhancement (cf. Han, Park, & Combs, 2008 and Lee & Huang, 2008 for reviews), focusing on a wide range of constructs such as comprehension, recall, noticing, intake, production, and learning. Overall, results concerning the benefits of input enhancement have been inconclusive, with some studies finding positive effects, others finding negative effects, and yet others finding no effect at all. However, Lee and Huang's (2008) meta-analysis of 16 input enhancement studies found only a small effect for L2 learning when comparing input enhancement with input flood, suggesting that enhancing linguistic items may be of minimal benefit when the text is already seeded with numerous exemplars of the target structure. Nevertheless, a brief review of the findings of individual studies is necessary to further explore the effects of input enhancement.

### 3. Positive effects of textual enhancement

Various studies have found positive effects of input enhancement on constructs such as recall (Jourdenais, Ota, Stauffer, Boyson, & Doughty, 1995; Lee, 2007), noticing (Izumi, 2002; Jourdenais et al., 1995; Winke, 2013), production (Shook, 1994, White, 1996), and learning (Lee, 2007; Shook, 1994; White, 1996, 1998). For instance, Jourdenais et al. (1995) examined the effect of reading a visually enhanced text on second semester Spanish L2 learners' noticing of the Spanish preterit and imperfect verb forms. Their data consisted of think-aloud protocols produced while participants were writing a picture-based narrative after the reading task. As for their results, although their sample size was small ( $n=14$ ), the authors noted that participants in the enhanced group produced more preterit and imperfect forms than the other group and that, therefore, input enhancement "promotes noticing of target L2 form and has an effect on learners' subsequent output" (Jourdenais et al., 1995, p. 208). In another study, Shook (1994) investigated the effect of input enhancement on L2 Spanish learners' intake of the present perfect and the relative pronouns using two written production tasks and two written recognition tasks (one task focusing on the present perfect and the other on the relative pronouns). The participants were divided into three conditions, unenhanced, enhanced, and enhanced with the explicit instruction focusing on the targeted forms. Shook's results suggested that the two groups that were exposed to input enhancement performed significantly better than the control group but that there were no differences between the two enhanced groups.

#### 4. Negative effects of textual enhancement

To date, only two published studies have shown negative effects of textual enhancement on comprehension. Under the assumption that learners may have difficulty focusing on linguistic form as well as meaning (cf. VanPatten, 1990), these studies compared input enhancement using texts that contained either familiar or unfamiliar content for the learners. Overstreet (1998) investigated the issue of text content familiarity in relation to learners' knowledge and use of Spanish preterit and imperfect forms. The participants were 50 adult English speakers in a third semester Spanish class, who were divided into four groups of a combination of [+/-] enhancement and [+/-] text familiarity. The two texts were a Spanish version of "Little Red Riding Hood" (familiar topic) and a condensed version of a Spanish short story (unfamiliar topic). For the textual enhancement, Overstreet used a larger font size and underlining for both preterit and imperfect verbs; however, the preterit verbs were also shadowed while the imperfect ones were bolded. The assessment comprised circle-the-verb pretest/posttest tasks, a written narration task and a comprehension quiz. No main effects of enhancement or text familiarity were found for L2 development, but the results suggested that textual enhancement had a negative impact on comprehension. Overstreet concluded that learners could not focus their attentional resources on both content and form at the same time and that textual enhancement directed their attention away from comprehension. In another study, Lee (2007) examined the effects of textual enhancement and content familiarity on learners' attention to forms. The results indicated that there were significant differences between the enhancement and the baseline conditions but that topic familiarity had a negligible effect. Lee's interpretation was that textual enhancement aided learning of the target forms but had an unfavorable effect on comprehension. Conversely, topic familiarity aided comprehension but was ineffective in terms of learning of the passive form.

#### 5. No effect of textual enhancement

Finally, a number of studies have found no effect of textual enhancement on intake (Leow, 1997b, 2001; Leow, Egi, Nuevo, & Tsai, 2003; Overstreet, 1998), acquisition (Izumi, 2002; Winke, 2013; Wong, 2000, 2003), noticing (Leow, 2001) or comprehension (Alanen, 1995; Jourdenais, 1998; Leow, 1997b, 2001; Leow et al., 2003; Winke, 2013; Wong, 2000, 2003). For instance, Leow (1997b) investigated the effects of textual enhancement and text length on L2 learners' comprehension and intake of the Spanish formal imperative. He found a main effect for text length on comprehension but no significant differences in comprehension and intake between the enhanced and unenhanced groups.

In an effort to measure noticing of enhanced forms, some studies have used concurrent (e.g., Leow, 2001) or subsequent (Jourdenais et al., 1995) think-aloud methods, in which participants verbalized their thoughts either online (i.e., during the reading task) or off-line (i.e., after the reading task). Leow's (2001) results revealed that the amounts of reported noticing were statistically similar for the participants who read an enhanced text and those who read an unenhanced version, suggesting that enhanced input did not significantly promote comments on targeted forms compared to unenhanced input. Moreover, there were also no significant benefits of written input enhancement for either the readers' comprehension or the readers' intake. Interestingly, a qualitative analysis revealed that only two participants were aware of the grammatical targeted forms at the level of understanding, making explicit reflective metalinguistic references to those forms.

The results of a study on the effects of textual enhancement on the acquisition of Spanish preterit and imperfect led Jourdenais (1998) to suggest that input enhancement's lack of effectiveness for acquisition may be due to the complexity of the targeted forms, the lack of saliency of the enhancement, and the learners' stages of aspectual development. Finally, a recent study by Winke (2013) further investigated the effects of textual enhancement on grammar learning and comprehension. She examined how input enhancement (coloring and underlining) affected 55 intermediate ESL learners' use of the passive construction after reading a text flooded with the passive voice. Half of the participants read the text with input enhancement and the second half served as controls. The results showed that the participants in the enhancement group looked longer at the passive forms but did not improve more on a form correction post-test than the control group did. In fact, neither group showed significant improvement from pretest to posttest, indicating that although textual enhancement may attract attention, it might not be sufficient for immediate acquisition to take place. One other possible explanation given by Winke to account for the lack of learning is that the participants might not have been developmentally ready to learn the passive construction. Finally, in line with previous research (e.g., Leow, 1997b, 2001, but see Overstreet, 1998 for exception), Winke's data revealed that textual enhancement did not affect comprehension, as measured by a free-recall test.

## 6. Noticing and attention

Although the perception of external stimuli is argued to be a necessary precursor for L2 learning, the exact characteristics of noticing, attention and awareness in L2 learning remain controversial (Godfroid, Boers, & Housen, 2013; Leow, 1997a,

2000, 2001; Robinson, 1995, 2003; Schmidt, 1990, 2001; Simard & Wong, 2001; Tomlin & Villa, 1994; Wong, 2001, among others). In its original form, Schmidt's (1990) noticing hypothesis claims that learners must consciously notice forms in the input for acquisition to take place. It is argued, however, that the term *noticing* conflates two different constructs, namely attention and awareness. Robinson (1995, 2003) describes attention as detection plus rehearsal in working memory. The implication of this definition is that attention is a continuous construct that can be maintained for various amounts of time, that is to say, people can pay more or less attention to stimuli (Godfroid et al., 2013). Awareness, on the other hand, involves conscious recognition of the stimuli that has been attended to; consequently, awareness can be viewed as a dichotomous construct according to which people either are or are not aware of the stimuli.

A variety of measures have been used in SLA research to measure Schmidt's construct of noticing, although most have investigated it at the level of awareness. For example, concurrent or retrospective verbal reports involve individuals voicing their thoughts either while or after they conduct an activity. However, there is some concern about the reactivity of concurrent measures and the veridicality of retrospective measures (Bowles, 2010). In addition, verbal reports generally measure awareness rather than attention due to need for participants to comment on their thought processes (Godfroid et al., 2013).

A method of measuring attention that is gaining popularity in SLA is eye tracking, which involves capturing participants' eye movements as they read a text or look at an object (cf. Frenck-Mestre, 2005 for an overview). Eye-tracking assumes a mind-eye link in which it is argued that the object that holds the eye's gaze is being cognitively attended to (Frazier & Rayner, 1982; Godfroid et al., 2013; Leow, Grey, Marijuan & Moorman, 2014; Rayner, 1998). Therefore, for example, the longer individuals look at a word in a text, the more attention they are paying to that word. This attention, then, can potentially facilitate the acquisition of new linguistic items or the restructuring of existing knowledge. For example, Godfroid et al. (2013) investigated the relationship between L2 learners' fixation duration on pseudowords in a text and subsequent vocabulary recognition. Results indicated that learners spent more time looking at pseudowords than their matched real-word counterparts, a phenomenon that Godfroid et al. equated with increased learner attention to those pseudowords. Furthermore, increased reading time was associated with better posttreatment vocabulary recall, underscoring the positive effects of increased attention on L2 learning.

One added benefit of eye tracking as a method for investigating attention is that it does not interfere with the reading process by taxing the learner with additional activities (such as thinking aloud), and it does not rely on posttask measures which do not measure attentional focus in real time (Leow et al., 2014).

Building on previous research of focus on form and noticing, the current study addresses the following research questions (RQ), with RQ 1 addressing attention and RQ 2 addressing awareness:

1. Do participants reading a text with visually enhanced preterit and imperfect Spanish verbs look longer at those verbs than do learners reading an unenhanced version of the text?
2. Do learners self-report greater levels of awareness of the target structure after reading a visually enhanced text than do learners reading an unenhanced version of the text?
3. Does visual input enhancement affect learners' subsequent accurate use of the targeted structures in cloze tests and spontaneous oral production?

## 7. Method

### 7.1. Participants

A total of 30 college-level students (26 females and 5 males) enrolled in second-semester Spanish courses at a large Midwestern university participated in the experiment. They were all native speakers of American English, ranging from 18 to 25 years old ( $M = 19.7$ ). In addition, 16 native Spanish speakers participated in the study and served as controls. Of the 30 L2 learners, 15 were randomly assigned to the experimental group (enhanced) and 15 to the comparison group (unenhanced). Similarly, 8 native speakers were exposed to an enhanced text and eight read the same text without textual enhancement.

### 7.2. Targeted linguistic forms

The targeted grammatical structure for this study, the Spanish preterit and imperfect past tense, was chosen for several reasons. From a general SLA point of view, these forms have received considerable attention from researchers and educators due to the difficulty they can pose for learners of Spanish with an L1 that does not mark the past tense and aspect simultaneously (Montrul & Salaberry, 2003). Spanish, as other Romance languages, has two forms, preterit and imperfect, which correspond to the aspectual distinction of perfective versus imperfective. All verbs possess "lexical aspect," where aspect is inherent in the meaning of the verb and its telicity (Vendler, 1967); in contrast, "grammatical aspect" is marked by inflectional morphology (Montrul, 2004). While the preterit, which is bolded in the example in (1), is typically used with telic verbs (representing events with an endpoint, such as verbs of accomplishment and

achievement), the imperfect, which is underlined in (1), is more often associated with atelic verbs (representing activities and states) (Ayoun & Salaberry, 2005).

- (1) *Un cazador que pasaba cerca escuchó los gritos de Caperucita.*  
'A hunter, who was passing by, heard Little Red Riding Hood's screams.'

A more specific motivation for the use of the Spanish imperfect and preterit was that these forms had previously been used in other textual enhancement studies (Jourdenais, 1998; Jourdenais et al., 1995; Overstreet, 1998), allowing a partial replication of these studies. (See Porte, 2012 for a discussion of the importance of replication in SLA.) Finally, at the time of the experiment, namely towards the end of their second semester of Spanish, learners had been exposed to the forms and had received explicit information about them (Spanish Language Program Coordinator, personal communication). In the course textbook, *Aventuras* (Donley, Benacides, & Blanco, 2006), the preterit tense is presented in Chapters 6-9 and 11; the imperfect tense is presented in Chapters 10 and 11. There are a total of 16 chapters. Finally, an additional rationale for using the preterit/imperfect tenses was that it is a developmental structure which could show room for improvement, especially for lower proficiency learners. Choosing a structure totally novel to the learners might have prevented them from making sense of the reading.

### 7.3. Instruments

In addition to a general language background questionnaire, the following instruments were used: a reading task, a cloze test, an oral production task, and an exit questionnaire.

#### 7.3.1. Reading task

The treatment task consisted of a lexically slightly simplified version of Overstreet's (1998) text entitled „Caperucita Roja,” a Spanish version of „Little Red Riding Hood” (both the Spanish text and its English equivalent are included in Appendix A). This text had the advantage of having been used in previous studies, allowing for replication; in addition, students' knowledge of this common fairy tale was hypothesized to facilitate comprehension (Lee, 2007) although learners might not necessarily have used this advantage to reallocate attentional resources to linguistic forms (Leeser, 2004; VanPatten, 1990). The text contained 211 words and a total of 28 past tense forms, 18 preterit and 10 imperfect. In general, reading passages in visually enhanced input studies are presented as



whole texts; however, in order for the eye tracker to provide accurate information about learners' gaze at the word level, it was necessary to divide the text into three sections, with an average of 69 words per section. The sections were presented consecutively on a 20-inch computer screen, with the participants using a game controller to advance to the next section of the text. The words in the text appeared in black, Calibri, size 24 font against a light blue background. The lines of the text were double-spaced. In the enhanced version, all imperfect verbs were highlighted in red and all preterit in green. Even though Simard (2008) found significant effects for a combination of highlighting techniques, no other enhancements were used in this study because any difference in the size of the enhanced items would create confounding differences in the eye tracking data (Dussias, 2010). Five glossed words, containing the Spanish form and the English translation, appeared in a word bank at the bottom of each slide. Although the same glosses were included on all three slides, the target words did not necessarily appear in each slide, as seen in Appendix A. The glossed words appeared in both the enhanced and unenhanced conditions, meaning that all participants experienced the same lexical input.

### 7.3.2. Cloze test

To assess participants' knowledge of the past tense forms, a modified version of Overstreet's (1998) cloze test was designed, which is included in Appendix B. In the original version, learners were provided both the preterit and imperfect form of each verb and were asked to circle the correct form. In the current test, learners were provided with the infinitive form of the verb and were asked to write down the correct form. A total of 18 verbs (9 preterit and 9 imperfect) were used in each test. Two versions of the test were used. Both tests contained the same number of targeted verbs; however, one version was slightly longer than the other (166 versus 145 words). To rate the tests, the responses of the 16 Spanish native speakers were used as the answer key. Participants were given one point for each correct verb, and half a point for responses with the correct tense but errors in the person and number of the verb. A total of 18 points was possible to be scored. The reliability scores for the cloze tests using Cronbach's alpha were  $\alpha = .819$  for Pretest A,  $\alpha = .924$  for Posttest A,  $\alpha = .891$  for Pretest B, and  $\alpha = .731$  for Posttest B.

### 7.3.3. Oral production test

A series of six picture cards depicting various scenes from „Little Red Riding Hood“ was used to elicit an oral narrative from the participants. The first card

contained the phrase *Había una vez una chica que se llamaba Caperucita Roja* 'Once upon a time, there was a girl called Little Red Riding Hood' in order to establish an obligatory past tense context. The same six pictures were used for the pretest and posttest, and the narrations were video-recorded for subsequent analysis. *For the grammatical structure, a target-like use analysis (Pica, 1983) was conducted to obtain the percentage of past tense verbs used correctly. On average, there were fifteen obligatory occasions to use past tense forms during the narration*

#### 7.3.4. Exit questionnaire

*Because of the suitability of verbal reports as a measure of awareness (Godfroid et al., 2013), an exit questionnaire was used to investigate learners' awareness of the targeted forms. Two similar questionnaires were developed. The enhanced group was asked if they noticed that some words were highlighted, and if so, what the highlighted forms were. They were also asked to self-report whether they had paid more attention to the highlighted words while reading the text. The unenhanced group was asked if they noticed any recurring grammatical forms in the text. The learners' responses were coded for their level of awareness of the target structure:*

- No awareness: The target structure was not identified or identified incorrectly (e.g., "*They clarified definitions, particularly of those of main characters*" or "*Subject first, then verb, then direct object or other action*"),
- Partial awareness: The target structure was partially identified (e.g., "*They were all conjugated verbs*"),
- Full awareness: The target structure was fully identified (e.g., "*They were all verbs conjugated in preterit and imperfect*").

#### 7.4. Procedures

The researchers visited four Spanish 102 classes during the middle of the semester to invite students to participate. Students came individually to an eye tracking laboratory where they underwent the following activities in the following order: (a) language background questionnaire, (b) cloze pretest, (c) oral production pretest, (d) treatment reading passage, (e) cloze posttest, (f) oral production posttest, and (g) exit questionnaire. The entire procedure took approximately 30 to 45 minutes, with the text reading portion taking about 15 minutes. Participants were paid ten US dollars for completing the study.

The eye tracker used for the experiment was a SR Research Ltd. EyeLink 1000 system. The participants sat approximately 60 centimeters from the screen with their head on a chinrest. After calibrating the eye tracker, the researcher

provided the following instructions: “*Now you will read the story of Caperucita Roja on the computer. Please pay attention to see if there are any differences between the written text and the story you told [i.e., on the pretest]. Don’t read the story aloud. Take as much time as you need to read each slide.*”

In order to capture the focus of learners’ attention, the movements of the left eye were recorded for the whole duration of the experiment (Godfroid et al., 2013; Leow et al., 2014). Then, the researchers extracted (a) the number of fixations for each targeted item, (b) the amount of time, in milliseconds, that participants spent looking at each targeted item, and (c) the duration of the first fixation. The average total time for each of the targeted verbs was calculated; however, only the overall average total times are reported.

## 7.5. Analysis

A series of *t* tests and mixed design ANOVAs was conducted, with the test scores and eye tracking data serving as the dependent variables, and enhancement condition (enhanced versus unenhanced) and L1 status (native speaker of Spanish versus learner of Spanish) as the independent variables. In order to run parametric statistics, the assumptions of normal distribution and homogeneity of variance were investigated using Kolmogorov-Smirnov and Levene’s tests, respectively. These assumptions were met in most instances. If an assumption was violated, an appropriate nonparametric test was conducted if available.

## 8. Results

The first research question investigated the effects of text manipulation on the length of reading time. Table 1 shows that the L2 Spanish readers in the enhanced condition had an average verb total time of 712 milliseconds, meaning that on average participants spent slightly over half a second looking at each verb. The L2 Spanish readers in the unenhanced condition averaged 639 milliseconds per verb. In contrast, the L1 Spanish readers averaged 375 and 282 milliseconds in the enhanced and unenhanced conditions, respectively. A one-way ANOVA indicated statistical differences among the groups,  $F(3, 42) = 13.217$ ,  $p < .001$ , partial eta squared = .48, and a Bonferroni post hoc test revealed that the statistical differences were between the L1 and L2 Spanish groups ( $p < .001$ ). However, there were no statistical differences within each language group between the enhanced and unenhanced conditions. These results indicate that overall, the Spanish L1 readers spent less time attending to the verbs than did the L2 readers, but the presence of highlighted verbs did not result in either language group reading for statistically significantly longer total times.

Table 1 Average total time (in ms)

	Spanish L2				Spanish L1			
	Enhanced ( <i>n</i> = 15)		Unenhanced ( <i>n</i> = 15)		Enhanced ( <i>n</i> = 8)		Unenhanced ( <i>n</i> = 8)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Total verbs	712	544	639	459	375	320	282	179

The second question investigated learners' self-reported awareness of the target structures. In the enhanced condition, all 15 participants reported being aware that there were visually enhanced items in the text. However, not all of them were able to identify the nature of the enhanced items. Four participants (26.5%) did not report being aware that the past tense was the enhanced structure, 7 (47%) described partial awareness (e.g., commenting that the enhanced forms were all verbs), and 4 participants (26.5%) identified the enhanced structure correctly. In the unenhanced reading condition, participants were asked if they noticed any repeatedly used grammatical structures in the text. Two of the participants (13%) said that they were not aware of any recurring grammatical structure. In contrast, nine participants (56%) indicated that they were aware of the targeted structure, while five (31%) reported other grammatical structures such as conjugated verbs. Due to the categorical nature of the data and the slightly altered wording of the questions due to the enhanced and unenhanced conditions, no inferential statistics were computed on these data. Nevertheless, more than half of the participants in the unenhanced group identified the target structure correctly, while only a quarter of those in the enhanced condition did so.

To see if text enhancement affected learners' subsequent ability to accurately mark the preterit and imperfect tenses, the results of the past tense cloze test, shown in Table 2, were examined using a mixed design ANOVA. The pretest scores show that the enhanced group's scores were somewhat higher than the unenhanced group's pretest scores; however, this difference was not statistically significant. Both groups had higher posttest scores, with the enhanced group averaging 7 correct verbs out of 18, while the unenhanced group was slightly lower at an average of 6 correct answers. An ANOVA revealed a significant main effect for test time,  $F(1, 28) = 5.790$ ,  $p = .023$ , partial eta squared = .171, observed power = .642. However, the main effect for treatment condition was not significant,  $F(1,28) = 1.727$ ,  $p = .245$ , partial eta squared = .058, observed power = .245. The interaction effect between treatment and test time was also nonsignificant,  $F(1, 28) = 1.566$ ,  $p = .221$ , partial eta squared = .053, observed power = .227. Thus, the ANOVA results indicate that there were no overall differences between the two groups' cloze test performance and that both groups improved statistically equally from the pretest to the posttest.

Table 2 Cloze test scores (max.: 18)

	Enhanced (n = 15)		Unenhanced (n = 15)	
	M	SD	M	SD
Pretest	7.4	4.24	4.8	4.10
Posttest	7.9	4.57	6.7	4.29

To see if reading the visually enhanced text affected learners' subsequent accurate use of the past tense in spontaneous oral productions, the results of the oral narration pretest and posttest were examined using a mixed design ANOVA. The pretest scores in Table 3 show that the enhanced group's scores were somewhat higher than the unenhanced pretest scores; however, this initial difference was not statistically significant. Both groups had higher posttest scores, with the enhanced group using correct verb forms 31% of the time, while the unenhanced group was lower at an average of 17%. An ANOVA revealed a significant main effect for test time,  $F(1, 28) = 5.669, p = .024$ , partial eta squared = .168, observed power = .633. However, the main effect for treatment condition was not significant,  $F(1, 28) = 3.041, p = .092$ , partial eta squared = .098, observed power = .391. The interaction effect between treatment and test time was also nonsignificant,  $F(1, 28) = .885, p = .355$ , partial eta squared = .031, observed power = .149. Thus, the ANOVA results indicate that, again, there were no overall differences between the two groups, although both groups improved from the pretest to the posttest.

Table 3 Oral production accuracy scores (percentage of target-like use)

	Enhanced (n = 15)		Unenhanced (n = 15)	
	M	SD	M	SD
Pretest	.20	.16	.13	.15
Posttest	.31	.24	.17	.19

## 9. Discussion and conclusions

To summarize the findings, the comparison of the enhanced and unenhanced groups show that enhancement did not induce learners to look at the verbs longer, nor did it result in greater gains on the cloze test or production task. Furthermore, enhancement was not accompanied by higher levels of self-reported awareness of the targeted structure. Indeed, more participants in the unenhanced condition were able to identify the target structures correctly.

The results of this study suggest several things. First, similar to Overstreet's (1998) results, the current study found no effect for input enhancement, suggesting that the effects of input enhancement may not be that different from input flood in terms of attention and L2 development, as suggested by Han et al. (2008). The enhanced group did not look at the enhanced words longer, nor did they outperform the unenhanced group on the posttests. If, as researchers claim (e.g., Godfroid et al., 2013; Leow et al., 2014), eye tracking provides an effective measurement of attention, then the learners in this study did not pay more attention to the visually enhanced words. This lack of attention is at odds with the very purpose of input enhancement, which is to draw learners' attention to specific linguistic targets.

The current study's results are similar to Leow's (2001) study, in which he did not find differences in noticing levels between the enhanced and unenhanced groups. A possible explanation to account for the lack of attention to the enhanced forms is that the participants in our study were not explicitly told to focus on these forms. As Winke (2013) pointed out, not providing participants with explicit directions might affect their reading behaviors. In our study, participants were asked to compare the story on the screen to the story they had previously narrated during the oral pretest, but no specific direction was given regarding the enhanced form, which may differ from pedagogical practices in which teachers might explain the purpose of textual enhancement.

Nevertheless, in the current study, both groups improved from the pretest to the posttest, suggesting that the input flood, regardless of enhancement, was sufficient to induce short-term improvement in the target structures. Additional support for this conclusion comes from the self-reported awareness data in which more than 50% of the participants in the unenhanced condition reported awareness of the recurrence of preterit and imperfect verbs in the text. These results stand in contrast to Leow's (2001) study, in which most participants did not report noticing the targeted forms. The current results suggests that input flood may be just as salient, and just as beneficial, as input enhancement, at least for this type of short, simplified text.

As with any study, ours contains limitations. As is often the case with SLA studies, the small sample size is a limitation. It should be noted that the sample of 30 L2 participants is less than the median sample size of 48.5 for input enhancement studies (Lee & Huang, 2008), but greater than the average SLA sample size of 19 (Plonsky, 2011). Nevertheless, a larger sample size would have been desirable. Another limitation regards the constraints of using the eye tracking methodology. For example, previous research suggests that not all input enhancement has the same effect on learners. In a study with French speaking learners of English, Simard (2008) found that enhancement with capital letters

and a combination of three cues (capitalizing, bolding and underlining) promoted better test scores than other types of enhancement (including coloring) did. In the current study, we did not manipulate the type of enhancement, and furthermore, we were limited in our choice of enhancement because of the need for the words to be the same size in both conditions. It would be worthwhile exploring the possibilities and effects of other types of enhancement with the eye tracker. Finally, it is acknowledged that the study did not include a delayed posttest to measure the long term effects of the treatment.

In the end, however, this study has shown that the use of eye tracking methodology can provide useful insights into the amount of attention that is given to targeted structures in focus on form activities. Indeed, in this study we discovered that the enhancement we had intended to make the target structure more salient did not do so, as measured by the amount of time participants looked at the words. Additional eye tracking studies of input enhancement can further add to our knowledge of what participants do with the texts that they are provided.

Furthermore, the current study adds to our understanding of the effects of visual input enhancement on L2 development. In line with previous studies and research syntheses, we found that the difference between input flood and input enhancement may not be statistically or practically significant. Researchers, and especially L2 teachers, may therefore wish to consider if, and how, they would like to incorporate this focus on form technique into the L2 classroom.

## References

- Alanen, R. (1995). Input enhancement and rule presentation in second language acquisition. In R. W. Schmidt (Ed.), *Attention and awareness in foreign language learning* (pp. 259-302). Honolulu, HI: University of Hawai'i.
- Ayoun, D., & Salaberry, R. (2005). *Tense and aspect in Romance languages*. Amsterdam: John Benjamins.
- Bowles, M. (2010). *The think-aloud controversy in second language research*. New York: Routledge.
- Donley, P., Benacides, J., & Blanco, J. (2006). *Aventuras: Primer curso de lengua española*. Boston, MA: Vista Higher Learning.
- Doughty, C., & Williams, J. (1998). *Focus on form in classroom second language acquisition*. Cambridge: Cambridge University Press.
- Dussias, P. E. (2010). Uses of eye-tracking data in second language sentence processing research. *Annual Review of Applied Linguistics*, 30, 149-166.
- Ellis, R. (2001). Introduction: Investigating form-focused instruction. *Language Learning*, 51, 1-46.
- Ellis, R., Loewen, S., & Erlam, R. (2006). Implicit and explicit corrective feedback and the acquisition of L2 grammar. *Studies in Second Language Acquisition*, 28, 339-368.
- Frazier, L., & Rayner, K. (1982). Making and correcting errors during sentence comprehension: Eye movements in the analysis of structurally ambiguous sentences. *Cognitive Psychology*, 14, 178-210.
- Frenck-Mestre, C. (2005). Eye-movement recording as a tool for studying syntactic processing in a second language: A review of methodologies and experimental findings. *Second Language Research*, 21, 175-198.
- Godfroid, A., Boers, F., & Housen, A. (2013). An eye for words: Gauging the role of attention in L2 vocabulary acquisition by means of eye-tracking. *Studies in Second Language Acquisition*, 35(3), 483-517.
- Han, Z., Park, E. S., & Combs, C. (2008). Textual enhancement of input: Issues and possibilities. *Applied Linguistics*, 29(4), 597-618.
- Izumi, S. (2002). Output, input enhancement, and the noticing hypothesis: An experimental study on ESL relativization. *Studies in Second Language Acquisition*, 24, 541-577.
- Jourdenais, R. (1998). *The effects of textual enhancement on the acquisition of the Spanish preterit and imperfect* (Unpublished doctoral dissertation). Georgetown University, Washington, DC, USA.
- Jourdenais, R., Ota, M., Stauffer, S., Boyson, B., & Doughty, C. (1995). Does textual enhancement promote noticing? A think-aloud protocol analysis. In R. Schmidt (Ed.), *Attention and awareness in foreign language learning*



- (pp. 183-216). Honolulu: University of Hawai'i Press.
- Lee, S. K. (2007). Effects of textual enhancement and topic familiarity on Korean EFL student's reading comprehension and learning of passive voice. *Language Learning, 57*, 87-118.
- Lee, S. K., & Huang, H. T. (2008). Visual input enhancement and grammar learning: A meta-analytic review. *Studies in Second Language Acquisition, 30*, 307-331.
- Leeser, M. (2004). The effects of topic familiarity, mode, and pausing on second language learners' comprehension and focus on form. *Studies in Second Language Acquisition, 26*(4), 587-616.
- Leow, R. P. (1997a). Attention, awareness, and foreign language behavior. *Language Learning, 47*, 467-505.
- Leow, R. P. (1997b). The effects of input enhancement and text length on adult L2 readers' comprehension and intake in second language acquisition. *Applied Language Learning, 8*, 151-182.
- Leow, R. P. (2000). A study of the role of awareness in foreign language behavior: Aware versus unaware learners. *Studies in Second Language Acquisition, 22*, 557-584.
- Leow, R. P. (2001). Do learners notice enhanced forms while interacting with the L2? An online and offline study of the role of written input enhancement in L2 reading. *Hispania, 84*, 496-509.
- Leow, R. P., Egi, T., Nuevo, A. M., & Tsai, Y.-C. (2003). The roles of textual enhancement and type of linguistic item in adult L2 learners' comprehension and intake. *Applied Language Learning, 13*, 1-16.
- Leow, R. P., Grey, S., Marijuan, S., & Moorman, C. (2014). Concurrent data elicitation procedures, processes, and early stages of L2 learning: A critical overview. *Second Language Research, 30*, 111-127.
- Loewen, S. (2011). Focus on Form. In E. Hinkel (Ed.), *Handbook of research in second language teaching and learning* (Vol. 2, pp. 576-592). New York: Routledge.
- Loewen, S., Erlam, R., & Ellis, R. (2009). The incidental acquisition of third person – s as implicit and explicit knowledge. In R. Ellis, S. Loewen, C. Elder, R. Erlam, J. Philp, & R. Reinders (Eds.), *Implicit and explicit knowledge in second language learning, testing and teaching* (pp. 262-280). Bristol: Multilingual Matters.
- Loewen, S., & Philp, J. (2006). Recasts in the adult L2 classroom: Characteristics, explicitness and effectiveness. *Modern Language Journal, 90*, 536-556.
- Long, M. (1991). Focus on form: a design feature in language teaching methodology. In K. de Bot, R. Ginsberg, & C. Kramsch (Eds.), *Foreign language research in cross-cultural perspective* (pp. 39-52). Amsterdam: John Benjamins.
- Long, M. (1996). The role of the linguistic environment in second language acquisition. In W. Ritchie & T. Bhatia (Eds.), *Handbook of second language acquisition* (pp. 413-468). San Diego: Academic Press.

- Long, M., & Robinson, P. (1998). Focus on form: Theory, research and practice. In C. Doughty & J. Williams (Eds.), *Focus on form in classroom second language acquisition* (pp. 15-41). Cambridge: Cambridge University Press.
- Montrul, S. (2004). *The acquisition of Spanish: Morphosyntactic development in monolingual and bilingual L1 acquisition and adult L2 acquisition*. Amsterdam: John Benjamins.
- Montrul, S., & Salaberry, R. (2003). The acquisition of Spanish tense and aspect. In B. Lafford & R. Salaberry (Eds.), *The acquisition of Spanish: The state of the science* (pp. 47-73). Washington DC: Georgetown University Press.
- Nicholas, H., Lightbown, P., & Spada, N. (2001). Recasts as feedback to language learners. *Language Learning, 51*, 719-758.
- Norris, J., & Ortega, L. (2000). Effectiveness of L2 instruction: A research synthesis and quantitative meta-analysis. *Language Learning, 50*, 417-528.
- Overstreet, M. (1998). Text enhancement and content familiarity: The focus of learner attention. *Spanish Applied Linguistics, 2*, 229-258.
- Pica, T. (1983). Methods of morpheme quantification: Their effect on the interpretation of second language data. *Studies in Second Language Acquisition, 6*, 69-78.
- Plonsky, L. (2011). The effectiveness of second language strategy instruction: A meta-analysis. *Language Learning, 61*, 993-1038.
- Porte, G. K. (Ed.). (2012). *Replication in applied linguistics: A practical guide*. Cambridge: Cambridge University Press.
- Rayner, K. (1998). Eye movements in reading and information processing: 20 years of research. *Psychological Bulletin, 124*, 372-422.
- Robinson, P. (1995). Attention, memory and the "noticing" hypothesis. *Language Learning, 45*, 283-331.
- Robinson, P. (2003). Attention and memory during SLA. In C. J. Doughty & M. H. Long (Eds.), *The handbook of second language acquisition* (pp. 631-678). New York: Blackwell.
- Schmidt, R. (1990). The role of consciousness in second language learning. *Applied Linguistics, 11*, 129-158.
- Schmidt, R. (2001). Attention. In P. Robinson (Ed.), *Cognition and second language instruction* (pp. 3-32). Cambridge: Cambridge University Press.
- Sharwood Smith, M. (1991). Speaking to many minds: On the relevance of different types of language information for the L2 learner. *Second Language Research, 7*, 118-132.
- Sharwood Smith, M. (1993). Input enhancement in instructed SLA: Theoretical bases. *Studies in Second Language Acquisition, 15*, 165-179.
- Shook, D. J. (1994). FL/L2 reading, grammatical information, and the input-to-intake phenomenon. *Applied Language Learning, 5*, 57-93.

- Simard, D. (2008). Differential effects of textual enhancement formats on intake. *System*, 37(1), 124-135.
- Simard, D., & Wong, W. (2001). Alertness, orientation, and detection: The conceptualization of attentional functions in SLA. *Studies in Second Language Acquisition*, 23, 103-124.
- Swain, M., & Lapkin, S. (1998). Interaction and second language learning: Two adolescent French immersion students working together. *The Modern Language Journal*, 82, 320-337.
- Tomlin, R., & Villa, V. (1994). Attention in cognitive science and second language acquisition. *Studies in Second Language Acquisition*, 16, 183-203.
- VanPatten, B. (1990). Attending to form and content in the input. *Studies in Second Language Acquisition*, 12, 287-301.
- Vendler, Z. (1967). *Linguistics and philosophy*. Ithaca, NY: Cornell University Press.
- White, J. (1996). *An input enhancement study with ESL children: Effects on the acquisition of possessive determiners* (Unpublished doctoral dissertation). McGill University, Montreal, Quebec, Canada.
- White, J. (1998). Getting the learners' attention: A typographical input enhancement study. In C. Doughty & J. Williams (Eds.), *Focus-on-form in second language classroom acquisition* (pp. 91-128). Cambridge: Cambridge University Press.
- Williams, J. (2005). Form-focused instruction. In E. Hinkel (Ed.), *Handbook of research in second language teaching and learning* (pp. 671-691). Mahwah, NJ: Lawrence Erlbaum.
- Winke, P. (2013). The effects of input enhancement on grammar learning and comprehension: A modified replication of Lee (2007) with eye-movement data. *Studies in Second Language Acquisition*, 35(2), 323-352.
- Wong, W. (2000). *The effects of textual enhancement and simplified input on L2 comprehension and acquisition of non-meaningful grammatical form* (Unpublished doctoral dissertation). University of Illinois, Urbana-Champaign, USA.
- Wong, W. (2001). Modality and attention to meaning and form in the input. *Studies in Second Language Acquisition*, 23, 345-368.
- Wong, W. (2003). Textual enhancement and simplified input: Effects on L2 comprehension and acquisition of non-meaningful grammatical form. *Applied Language Learning*, 13, 17-45.

APPENDIX A

“Caperucita Roja” and its English equivalent

Caperucita roja.

**Había** una vez una chica que **vivía** en el bosque. Caperucita roja, ese **era** su nombre porque siempre **llevaba** una capa roja, **visitaba** a su abuela los fines de semana. Un día, la madre le **dijo**: “Caperucita, anda y visita a la abuela, que está enferma, y llévale esta canasta de comida.”

En el camino, Caperucita se **encontró** con el lobo y le **dijo**: “¿Hola chica, a dónde vas?”

el bosque = woods	el lobo = wolf	el cazador = hunter
la canasta = basket	disparar = to shoot	

Once upon a time there was a girl who lived in the woods. Little Red Riding Hood was her name because she always wore a red hood. She visited her grandmother on the weekends. One day, her mother said to her, “Little Red Riding Hood, go and visit your grandmother who is sick and take this basket of food”. On the way, Little Red Riding Hood met a wolf, and the wolf said, “Hello little girl, where are you going?”

“Voy a la casa de mi abuela que está enferma,” **respondió**

Caperucita y **siguió** en camino.

El lobo **quería** comerse a Caperucita. Por eso el lobo **caminó** a la casa de la abuela y **se la comió** a ella primero. El lobo **se puso** la ropa de la abuela y **se metió** a la cama.

Cuando Caperucita **llegó**, el lobo **imitó** la voz de la abuela.

Caperucita **preguntó** al lobo por qué **tenía** esos ojos y esas orejas tan grandes.

el bosque = woods	el lobo = wolf	el cazador = hunter
la canasta = basket	disparar = to shoot	

"I'm going to my grandmother's house. She is sick," replied Little Red Riding Hood, and she continued on her way. The wolf wanted to eat Little Red Riding Hood. So the wolf walked to Grandma's house and ate her first. The wolf put on Grandma's clothes and went to bed. When Little Red Riding Hood arrived, the wolf imitated the grandmother's voice. Little Red Riding Hood asked the wolf why he had those big eyes and those big ears.

El lobo **respondió** que eran para verla y oirla mejor. En seguida, Caperucita **preguntó** por qué **tenía** la boca tan grande. El lobo **respondió**, "¡Para comerte mejor!"

Un cazador que **pasaba** cerca **escuchó** los gritos de Caperucita. El cazador **disparó** al lobo y **salvó** a la niña y a la abuela que todavía **estaba** viva en el estómago del lobo.

el bosque = woods

el lobo = wolf

el cazador = hunter

la canasta = basket

disparar = to shoot

The wolf replied that they were to see her and hear her better. Then, Little Red Riding Hood asked why his mouth was so big. The wolf replied, "To eat you better!" A hunter who was passing by heard the screams of Little Red Riding Hood. The hunter shot the wolf and saved the girl and her grandmother who was still alive in the wolf's stomach.

## APPENDIX B

## Proficiency tests

## Version A

Please write the correct form of each verb in the blank that follows. The first two have been done for you.

Cuando yo (tener) tenía doce años, (vivir) vivía con mis dos hermanas y mis padres en Chicago, donde yo (asistir) \_\_\_\_\_ a una escuela privada. Mi papá (trabajar) \_\_\_\_\_ en el Banco de América y mi mamá se (quedar) \_\_\_\_\_ en casa. Una de mis hermanas (estudiar) \_\_\_\_\_ en la escuela secundaria, y la otra no (estudiar) \_\_\_\_\_ en la escuela todavía. No me (gustar) \_\_\_\_\_ ir a la escuela, pero lo (hacer) \_\_\_\_\_.

Una vez, mis padres (viajar) \_\_\_\_\_ a Europa. Mis hermanas y yo nos (quedar) \_\_\_\_\_ con mi abuela. Todo (ir) \_\_\_\_\_ bien hasta que un sábado por la tarde mi hermana menor se (romper) \_\_\_\_\_ la nariz. Cuando mis padres (saber) \_\_\_\_\_ del accidente, (querer) \_\_\_\_\_ volver, pero mi abuela les (asegurar) \_\_\_\_\_ que no era necesario porque mi hermana (estar) \_\_\_\_\_ bien. Nosotros (ir) \_\_\_\_\_ al hospital, y el médico le (dar) \_\_\_\_\_ una inyección a mi hermana para ayudar con el dolor. Después, ella (comer) \_\_\_\_\_ helado para relajarse.

## Version B

Please write the correct form of each verb in the blank that follows. The first two have been done for you.

Jorge no (dormir) dormía muy bien durante la noche del domingo pasado porque le (doler) dolía el pecho. El lunes, cuando se (levantar) \_\_\_\_\_ Jorge todavía no se (sentir) \_\_\_\_\_ bien. Inmediatamente, él (hacer) \_\_\_\_\_ una cita con el médico. Él se (preocupar) \_\_\_\_\_ porque (temer) \_\_\_\_\_ algo serio, como un ataque al corazón. Jorge (ir) \_\_\_\_\_ al consultorio del médico, y mientras (esperar) \_\_\_\_\_, (leer) \_\_\_\_\_ un libro. Después de esperar un rato, le (tocar) \_\_\_\_\_ a él. El doctor lo (examinar) \_\_\_\_\_ y le (sacar) \_\_\_\_\_ unas radiografías. Después de revisar toda la información, el médico le (decir) \_\_\_\_\_ que no (ser) \_\_\_\_\_ nada grave, que solamente (estar) \_\_\_\_\_ muy cansado, que (deber) \_\_\_\_\_ dormir más y comer mejor. El doctor le (dar) \_\_\_\_\_ unas vitaminas y pastillas para dormir. Y cuando Jorge (llegar) \_\_\_\_\_ a casa ya se (sentir) \_\_\_\_\_ mucho mejor.