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The Roles of Textual Enhancement and Type of Linguistic Item in Adult L2 Learners' Comprehension and Intake

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Leow (2001a) employed concurrent data elicitation procedures (think aloud protocols) to investigate the benefits of textual enhancement, premised on the roles of attention and awareness (noticing), in second/foreign language (L2) learning. The present study follows this methodological approach to further investigate these benefits in addition to the role of type of linguistic item in subsequent processing of targeted items in the input. Seventy-two first year college-level participants read an enhanced or unenhanced text with either the present perfect or present subjunctive forms. Their performances on an immediate recognition and comprehension task were subsequently submitted to quantitative analyses. Results indicated no significant benefits of written input enhancement over unenhanced written input for (1) the amount of reported noticing of the Spanish present perfect or present subjunctive forms, (2) readers' comprehension or (3) readers' intake. With respect to type of linguistic item, significant benefits of more salient forms (present perfect) over less salient forms (present subjunctive) were found for (1) the amount of reported noticing of targeted verb forms, but not for (2) readers' comprehension or (3) readers' intake. Theoretical, methodological, and pedagogical implications are also discussed.

The 90's have witnessed quite a plethora of studies conducted under an attentional framework that underscores the crucial role of attention in promoting further processing of grammatical information in adult learners' second/foreign language (L2) development (e.g., Robinson, 1995; Schmidt, 1990, 1993, 1995, 2001; Tomlin & Villa, 1994). These studies typically included an instructional treatment or exposure that had been carefully designed, in some way, to promote learners' attention to and subsequent noticing of targeted linguistic forms in the L2 input. While explicitly drawing attention to targeted

forms in the input appeared to provide positive effects on learners' subsequent performances, implicitly drawing attention, for example, textual enhancement when compared to unenhanced input, did not appear to produce the same results (e.g., Alanen, 1995; Izumi, 1999; Jourdenais, 1998; Leow, 1997a, 2001a; Overstreet, 1998; White, 1998). Textual enhancement studies have typically employed typographical cues such as underlining, bolding, italicization, shading, different fonts or uppercase letters to enhance the saliency of targeted forms in the input. It was hypothesized that this enhancement would implicitly draw learners' attention to these highlighted forms, which, in turn, should theoretically promote superior noticing and further processing of the attended forms when compared to unenhanced input. While most of the textual enhancement studies conducted under this theoretical premise did not methodologically measure learners' noticing while exposed to the experimental L2 data (e.g., Jourdenais, 1998; Jourdenais, Ota, Stauffer, Boyson, & Doughty, 1995; Leow, 1997a; Overstreet, 1998; Shook, 1994; White, 1998), Leow (2001a) employed concurrent data elicitation procedures (think-aloud protocols) to address this internal validity limitation. He found no significant difference between the amount of noticing reported by the enhanced and unenhanced groups. The present study extends Leow's (2001a) methodological approach to the roles of textual enhancement and type of linguistic item in adult L2 learners' comprehension and intake in second language acquisition (SLA).

Review of the literature

Theoretical Foundation

The centrality of the role of attention in promoting subsequent processing, for example, intake[1], of grammatical information contained in L2 input has been generally accepted by different areas of research, for example, cognitive science (e.g., Tomlin & Villa, 1994), cognitive psychology (e.g., Carr & Curran, 1994), and SLA (e.g., Robinson, 1995; Schmidt, 1990 and elsewhere).[2] In SLA, recent studies (e.g., Leow, 1997b, 1998a, 2000, 2001a, 2001b; Rosa, 1999; Rosa & O'Neill, 1999) have employed concurrent data elicitation procedures to operationalize and measure the construct of noticing and its relationship with adult learners' subsequent behavior and learning in the L2 classroom. The findings have provided substantial empirical support for Schmidt's (1990 and elsewhere) noticing hypothesis. Following Leow (2001), the terms "attention" and "noticing" in this study will refer to the same attentional processes demonstrated by the adult participants, that is, it is assumed that any reported attention subsumes minimally a very low level of awareness.[3]

Empirical studies on textual enhancement in SLA

The benefits of textual enhancement (as an independent variable) over unenhanced input have been empirically addressed by at least nine SLA studies. Two studies (Jourdenais et al., 1995; Shook, 1994) found some positive benefits of textual enhancement on learners' L2 development while the other seven studies (Alanen, 1995; Izumi, 1999; Jourdenais, 1998; Leow, 1997a,

2001; Overstreet, 1998; White, 1998) did not. A summary of these studies is found in Table 1.

Table 1. *A Summary of Studies that Have Investigated the Benefits of Written Input Enhancement on Learners' L2 Development When Compared to Unenhanced Input.*

Study (Year)	Participants / L2 / Groups	Exposure time	Passage / Enchantment (Word number)	Target forms (Number of Items)	Measures of attention
Reported BENEFITS of input enhancement: Spanish Studies					
Shook (1994)	125 adult English speakers / 1st & 4th semester Spanish / 1) Enhanced + instructions to pay attention to pay attention to enhanced form 2) Enhanced - instructions 3) Unenhanced	Under 1 hour	2 passages: (185) Relative pronouns (217) / Uppercase, bold	Present perfect (6) Relative pronouns (6)	Offline: Fil-in-the-blank production test, MCrecognition
Jourdenais et al. (1995)	10 adult English speakers /2nd semester Spanish / 1) Enhanced 2) Unenhanced	Under 1 hour	1 Passage (210) / Underline, bold, shadow, different font	Preterit (18) Imperfect (10)	Offline: Think-aloud protocols during a production task following the treatment
Reported NO BENEFITS of input enhanement: Spanish studies					
Leow (1997a)	84 adult English speakers / 2nd semester Spanish / 1) Enhanced long passage 2)Enhanced short passage 3) Unenhanced long passage 4) Unenhanced short passage	Under 1 hour	2 passages: Long (631) Short (384) / Underline, bold	Formal imperatives (15: short; 24: long)	Offline: Comprehension task, MC recognition
Jourdenais (1998)	124 adult Enghlish speakers / 2nd semester Spanish / Spanish at five levels / 1) Enanced preterit 2) Enhanced imperfect 3) Enhanced preterit + imperfect 4) Unenhanced	During a week period	3 chapters of narrative / Underline, bold, different font	Preterit (36) Imperfect (36)	Offline: Think-aloud protocols during a picture-cued production task following the treatment
Overstreet (1998)	50 adult English speakers /3rd semsester Spanish / 1) Enhanced familiar content 2) Enhanced unfamiliar content 3) Unenhanced familiar content 4) Unenhanced unfamiliar content	Under 1 hour	2 passages: Familiar (210) Unfamilar (210) / Underline, bold, shadow, different font	Preterit (18) Imperfect (10)	Offline: Think-aloud protocols during a picture-cued production task, comprhension task
Leow (2001)	38 adult English speakers/ 1st year Spanish	Under 1 hour	1 passage (242) / Underline, bold	Formal imperative / command (17)	Online: Think-aloud protocols
Reported NO BENEFITS of input enhancement: Non-Spanish studies					
Alanen (1995)	36 adult English speakers / Semi-artificial Finnish / 1) Enhanced 2) Unenhanced 3) Rule-search 4) Enhanced + Rule-search	Under 1 hour	2 passages (87, 98) / Itallics	Locative suffixes (12-13) Consonant changes (5-8)	Online: Think-aloud protocols Offline: Grammaticality judgement test, sentence completion, rule statement
J. White (1998)	86 grade six francophone speakers / English / 1) Enhanced input flooding + extensive reading and listening 2) Enhanced input flooding	During a 2 week period	10-our instructioal package (short stories, fables, poems) / Bold	Third person singular possessives determiners	Offline: Picture description task

Note. MC = multiple choice.

As can be noted, only three of the nine studies (Alanen, 1995; Izumi, 1999; Leow, 2001a) attempted to establish that learners did notice the targeted forms/structures before statistically analyzing the relationship between noticing and subsequent learning. Although Alanen employed think-aloud protocols, a conflation of both online (think-aloud protocols) and offline (sentence completion, grammatical judgment, and rule statements) measures make interpretation of the results rather difficult. Izumi measured noticing via note-taking during exposure to the L2 input, a measurement that may be subjected to critique due to the qualitatively poor data it may have provided. Only Leow (2001a) employed online process measures (think-aloud protocols) to address the benefits of textual enhancement. In this study, 38 first year college-level participants were randomly assigned to read an enhanced or unenhanced L2 passage with the Spanish formal imperatives. Their performances on immediate and delayed recognition and written production assessment tasks were subsequently submitted to both quantitative and qualitative analyses. His results indicated no significant benefit of textual enhancement over unenhanced input for (1) amount of reported noticing of the Spanish formal imperatives, (2) readers' comprehension of text content, and (3) readers' intake of the targeted forms. Interestingly, a replication study of Leow (2001a) using participants at a higher level of language proficiency (4th semester) reported similar findings (Bowles, forthcoming). Leow suggests that future research using concurrent data elicitation procedures should include an empirical investigation of the role of type of linguistic item in subsequent processing in SLA.

Empirical studies on the type of linguistic item in SLA

There are at least six SLA studies that have investigated the effects of different types of linguistic item on adult L2 readers' attention, subsequent processing, or comprehension of targeted items in the input. A summary of these studies is found in Table 2.

While most of the studies do indicate significant differences in learners' performances between type of linguistic item, only half of them (Collentine, 1997; Greenslade, Bouden, & Sanz, 1999; VanPatten, 1990) attempted to gather some sort of concurrent data to address the internal validity issue found in many SLA studies (cf. Leow, 1999b, 2000 for further discussion of this issue). However, the operationalization of attention in these studies does not appear to be robust. Although a measure of attention used in Greenslade et al., circling, underlining or putting a check mark on the targeted items, may capture some degree of attention learners paid to the target input, the qualitatively poor data their measure provides may not be as robust evidence of attention as think-aloud protocols. Collentine employed processing time as a measure of attention, and VanPatten's participants were requested to put a check mark on a blank piece of paper whenever they heard the targeted items. In Collentine (1997) and VanPatten (1990), however, whether participants did indeed pay attention to the targeted forms in the input still remains speculative due to the type of data collected.

Table 2. A *Summary of Studies That Have Investigated Type of Linguistic Item.*

Study (Year)	Participants / L2	Exposure time	Passage (Word number)	Target forms (Number of items)	Measures of attention	Results
VanPatten (1990)	202 adult English speakers / 1st & 4th semester & 3rd year Spanish	Under 1 hour	1 passage (274)	Inflación (11) la (16) -n (13)	Online: Put a check mark on blank paper every time item heard Offline: Recall task for comprehension	Comprehension: inflación > la/-n la = -n
Leow (1993)	137 adult English speakers / 1st & 4th semester Spanish	Under 1 hour	2 passages: PP (233) PS (228)	PP (8) PS (8)	Offline: MC recognition	PP = PS
Shook (1994)	125 adult English speakers / 1st & 4th semester Spanish	Under 1 hour	2 passages: PP (185) Relative pronouns (217)	PP (6) Relative pronouns (6)	Offline: MC recognition, fill-in-the-blank production test	PP > Relative pronouns
Leow (1995)	213 adult English speakers / 1st & 4th semester Spanish	Under 1 hour	2 passages: PP (223) PS (228)	PP (8) PS (8)	Offline: MC recognition	PP > PS
Collentine (1997)	30 adult English speakers / 2nd year Spanish	Not reported	8 sentences (a word arranging task)	Regular PP (4) Irregular PP (4)	Online: Processing time Offline: Word arranging task	Processing time: Longer time for irregular PP Accuracy: Regular = Irregular
Greenslade et al. (1999)	53 adult English speakers / 3rd semester Spanish	Under 1 hour	1 passage (274)	Inflación (11) la (16) -n (13)	Online: Circle, underline, put a check mark on passage targeted item Offline: Recall task for comprehension	Attention: inflación > -n inflación = la la = -n Comprehension: inflación > la inflación = -n la = -n

Note. PP = present perfect; PS = present subjunctive; MC = multiple choice; X > Y = performance on X was significantly better than that on Y; X = Y: no significant difference between performances on X and Y.

The present study followed Leow's (2001a) methodological procedure to further address (1) whether readers exposed to enhanced forms do report noticing these forms substantially more than readers not exposed to enhanced forms and (2) whether reported noticing of enhanced or unenhanced forms has a significant relationship with learners' immediate recognition. In addition, whether type of linguistic item plays a role in L2 readers' reported

noticing and whether such reported noticing of linguistic item has a significant relationship with readers' immediate recognition of the item were also addressed. The study also investigated the effects of textual enhancement on L2 readers' comprehension of the content information when compared to readers exposed to the same input that was not enhanced. Finally, does exposure to type of linguistic item significantly affect readers' comprehension? The present study sought to address the following research questions (RQ):

RQ#1: Do readers exposed to enhanced text report significantly more noticing of targeted verb forms than readers exposed to unenhanced text?

RQ#2: Is there a significant relationship between the reported noticing of enhanced or unenhanced verb forms and the immediate recognition of these forms? If so, are the two relationships significantly different?

RQ#3: Do readers exposed to present perfect forms report significantly more noticing than readers exposed to present subjunctive forms?

RQ#4: Is there a significant relationship between the reported noticing of present perfect or present subjunctive forms and the immediate recognition of these forms? If so, are the two relationships significantly different?

RQ#5: Do L2 readers exposed to targeted enhanced forms comprehend the text significantly better than those exposed to targeted unenhanced forms?

RQ#6: Does exposure to type of linguistic item (present perfect vs. present subjunctive) have a significant effect on L2 readers' comprehension?

Method

Participants

A total of 188 adult college-level students enrolled in the first year Spanish courses participated in the experiment. At the time of the experiment, the targeted linguistic forms (the Spanish present perfect and present subjunctive) had not been formally taught to the participants. To ensure that the data only included participants who had minimal knowledge of the targeted linguistic form, participants who scored higher than 40% on the pretest were eliminated from the data analysis. Participants were also eliminated from the data analysis in the following cases: (1) failure to attend all sessions, (2) failure to produce clear and usable think-aloud protocols, or (3) turning back to the text while completing the posttest task. Of the original pool of 188 participants, 116 were eliminated. Of the remaining 72 participants who did qualify to be included in the analysis, 41 participants belonged to the experimental (enhanced) group and 31 participants belong to the control (unenhanced) group. Of the 41 participants in the experimental group, 17 participants were exposed to the present subjunctive forms as the targeted linguistic item, and 24 participants were exposed to the present perfect forms. Likewise, of the 31 participants of

the control or unenhanced group, 16 participants were exposed to the present subjunctive forms and 15 participants were exposed to the present perfect forms.

Targeted Linguistic Forms

The targeted linguistic forms were the Spanish present subjunctive and present perfect. These forms were selected in line with the motivation of the study to investigate whether type of linguistic item plays a role in noticing and input enhancement. The Spanish present subjunctive and present perfect forms were chosen because of their contrast in saliency: the present subjunctive is perceived to be less salient than the present perfect form due to, for example, a contrast between a morpheme (e.g., termin*e* "should finish") and two discrete words (e.g. *ha terminado* "has finished").

Materials

Reading Text

The texts used in the present study were modified versions of passages taken from magazine articles used in Leow (1993, 1995). The text entitled *Fuera de órbita* ("Out of orbit") contained 10 present perfect tense verbs. The other text entitled, *¿Por qué necesito comprar una computadora*? ("Why do I need to buy a computer?") contained 10 present subjunctive verbs. The passages were selected because of their authentic use of the targeted linguistic items and because the topics would be familiar to the participants. The texts of the experimental groups had typographically enhanced targeted linguistic items. The typographic enhancement consisted of (1) underlining the whole verb, (2) bolding the tense morpheme only, and (3) a larger font (e.g., ***deseen*** [subjunctive], *ha discutido* [present perfect]).

Assessment Tasks

To assess participants' intake of the targeted linguistic items, a 16-item multiple-choice recognition task was administered (cf. Leow, 1993 for the rationale of this task to assess intake). Participants selected one of four possible answers that they recognized from the article in order to complete an incomplete statement. For example:

1. Es esencial
A. que ustedes definen este primer aspecto.
B. para ustedes definir este primer aspecto.
C. que ustedes definan este primer aspecto.
D. ustedes definir este primer aspecto.

Of the 16 items, six were distractor items, which were not scored. Each target item was worth one point for a total of 10 points for the task. Participants were required to complete the task without going back to the text, and think-aloud protocols were employed to ensure this. A different version of this task

was also used as the pretest.

To assess participants' comprehension, a 10-item multiple choice comprehension task was administered immediately after the recognition task. Each item was worth one point for a total of 10 points for the task. The comprehension task was designed to elicit information exclusively from the article. It is important to note that the items were presented in English, the native language of the participants.

Testing Procedure

As illustrated in Table 3, the pretest, consisting of the recognition task, was administered first. Three weeks later, participants were randomly exposed to one of the following four conditions: +enhanced +subjunctive; +enhanced +present perfect; -enhanced +subjunctive; and –enhanced +present perfect. Participants were requested to think aloud while reading the passage. Immediately after the reading, participants were administered the recognition (intake) task followed by the comprehension task. The recognition task was administered before the comprehension task to avoid interference in measuring intake.[4]

Table 3. *Testing procedure.*

Time 1	Pretest
3 week-interval	
Time 2	Treatment: Reading & Think-aloud protocols Immediate posttest

Coding

In order to determine whether participants in either group (enhanced vs. unenhanced) noticed the targeted linguistic items, reported noticing by participants was measured. In this study, as in Leow (2001a), reported noticing was defined broadly as any correct or incorrect translation of Spanish text in English of the targeted verbs or verbal reference to the targeted forms as revealed in the think-aloud protocols. On the participants' version of the text,

reported noticing was also defined as any written marks related to the targeted verbs. Both the think-aloud protocols and participants' written marks on the text were transcribed and coded by two raters. Interrater reliability was 100%.

Results

To determine whether the amount of reported noticing was dependent on textual enhancement (research question 1), the mean numbers of reported instances of noticing the targeted forms in each group (6.02 [Enhanced] vs. 5.03 [Unenhanced]) were submitted to a parametric *t*-test. The test revealed that there was no statistically significant difference in the amount of reported noticing among the two groups ($t = 1.3$, $df = 70$, $p =$ n.s.).

To determine whether there was a relationship between reported noticing of enhanced versus unenhanced verb forms and subsequent immediate intake (research question 2), the forms participants reported noticing and the score for that particular form on the recognition task were submitted to a Pearson product-moment correlation analysis. The results revealed significant correlations between reported noticing and recognition for both the Enhanced group ($r = 0.57$; shared variance = 32%) and the Unenhanced group ($r = 0.66$; shared variance = 44%). To establish whether these statistically positive relationships for the two groups were significantly different, a Fishers' z Transformation and Comparisons between Independent *r*s was performed on the two correlational coefficients. The results revealed that there was no significant difference between the amount of variance in each group ($z = -0.58$, $p =$ n.s.).

To address whether the amount of reported noticing depended upon the type of linguistic item (research question 3), the mean numbers of reported instances of noticing (5.15 [Subjunctive] vs. 5.97 [Present Perfect]) were submitted to a parametric *t*-test. The test revealed that there was a statistically significant difference in the amount of reported noticing among the two groups: ($t = -1.08$, $df = 70$, $p = 0.008$). Reported instances of noticing in this study constituted 51.5% (Subjunctive) and 59.7% (Present Perfect).

To determine whether there was a relationship between reported noticing of Spanish present subjunctive verbs versus present perfect verbs and subsequent immediate intake (research question 4), the forms participants reported noticing and the score for that particular form on the recognition task were submitted to a Pearson product-moment correlation analysis. The results revealed significant correlations between reported noticing and recognition for both the present perfect ($r = 0.52$; shared variance = 27%) and present subjunctive group ($r = 0.70$; shared variance = 49%). To establish whether these statistically positive relationships for the two groups were significantly different, a Fishers' z Transformation and Comparisons between Independent *r*s was performed on the two correlational coefficients. The results revealed that there was no significant difference between the amount of variance in each group ($z = -1.18$, $p =$ n.s.)

To address whether the amount of comprehension depended upon the enhancement or lack thereof of the targeted verbs (research question 5),

the mean numbers of items correct on the comprehension task (4.19 [Enhanced] vs. 4.64 [Unenhanced]) were submitted to a parametric *t*-test. The test revealed that there was no statistically significant difference in the amount of comprehension among the two groups (t = -.90 , df = 70, p = n.s.).

To address whether the amount of comprehension depended upon the type of linguistic item to which participants were exposed (research question 6), the mean numbers of items correct on the comprehension task (4.24 [Subjunctive] vs. 4.24 [Present Perfect]) were submitted to a parametric *t*-test. The test revealed that there was no statistically significant difference in the amount of comprehension among the two groups (t = -.54, df = 70, p = n.s.).

Discussion

Previous studies on the effects of textual enhancement (Alanen, 1995; Izumi, 1999; Jourdenais, 1998; Jourdenais et al., 1995; Leow, 1997a; Shook, 1994; Overstreet, 1998; White, 1998) were conducted based on the premise that textual enhancement draws learners' attention to the targeted form, which theoretically promotes further processing of the attended linguistic form. Following Leow (2001a), the present study first empirically tested this premise by gathering concurrent think-aloud protocol data from the learners during exposure to the enhanced and unenhanced input (research question 1). The results indicated that the amount of reported noticing of targeted forms in the input was statistically similar for both enhanced and unenhanced groups. These findings corroborate those found in Leow (2001a) and once more provide one concurrent data based explanation for the failure of textually enhanced input to substantially benefit learners exposed to the enhanced input when compared to those exposed to the unenhanced input.

The think aloud protocols revealed an average of 55% of the targeted forms reported being noticed, an amount that is relatively similar to that found in Leow's (2001a) study (60%). When compared to higher levels of noticing reported during tasks such as problem-solving ones (e.g., Leow, 1997b, 2000, 2001b; Rosa, 1999; Rosa & O'Neill, 1999), the levels found in this study and Leow (2001a) are relatively low. Leow (2001a) postulated that the difference in levels of noticing reported might be due to task type. In other words, in a problem-solving puzzle task, learners generally deal with the targeted forms item by item in order to complete the task, while in the reading passage used in the present study and Leow (2001a), the learners processed the targeted forms more holistically at a sentential, paragraph, or even discourse level. The learners were also required to process meanings of both the targeted forms and other forms in order to understand the reading passage as a whole.[5] Given attention is capacity-limited (cf. McLaughlin, 1987), high task demands as a consequence of these task requirements may have taken up learners' attentional resources, resulting in processing of linguistic information at a superficial level. Of various strategies the learners employed to complete the task, the predominant strategies were translation and reading aloud the passage in Spanish.[6] Task types and task demands, which are learner-external factors that may

constrain noticing (cf. Harley, 1994; Robinson, 2003; Schmidt, 1990; Simard & Wong, 2001), are clearly variables that need to be considered.

The results for research question 2, that is, whether (a) there is a significant relationship between the reported noticing of enhanced or unenhanced verb forms and the immediate recognition of these forms and (b) whether these relationships were significantly different, revealed a positive answer for (a) and a negative answer for (b). Similar findings were also found for research question 4 with respect to the present subjunctive forms. These findings corroborate those found in Leow (2001a) and concurred with the findings of previous studies on noticing and subsequent processing of targeted forms in the input (Alanen, 1995; Leow, 1997b, 1998a, 2000, 2001a, 2001b; Rosa, 1999; Rosa & O'Neill, 1999). These studies together provide substantial empirical support for Schmidt's noticing hypothesis (Schmidt, 1990 and elsewhere).

Research question 3 addressed the effects of linguistic types on reported noticing. Perceptual saliency or lack thereof of linguistic forms by virtue of its communicative value (e.g., Leow, 1993, 1995; Mackey, Gass, & McDonough, 2000; Shook, 1994; VanPatten, 1990), bound vs. unbound morphemes (e.g., Greenslade et al., 1999), frequencies (e.g., Bardovi-Harlig, 1987; Gass, 1988, 1997; Harley, 1994), and so forth, is another factor influencing noticing. In the present study, present perfect and present subjunctive forms were presented in both the enhanced and unenhanced conditions. The results indicated that the learners exposed to the present perfect forms reported more noticing than those exposed to the present subjunctive forms. In light of the perceptual saliency of the present perfect forms over the more morphologically restricted present subjunctive forms, these results were not unexpected.

Research questions 5 and 6 addressed the effects or lack thereof of input enhancement and linguistic types on comprehension. The study indicated that exposure to input enhancement and perceptually salient linguistic forms does not significantly promote comprehension when compared to exposure to unenhanced input and less salient linguistic forms. The finding that input enhancement has no significant effect on comprehension was also found in Izumi (1999), Leow (1997a, 2001a), and Shook (1999). One explanation provided by Leow (2001a) may be the similar amount of noticing of the targeted forms reported by both the enhanced and unenhanced groups.

Limitations and Future Research

One of the limitations of the present study is the relatively small number of participants in each cell (approximately 18 participants in each cell). The number of participants in each cell was decreased drastically from the original pool of 188 participants due to an effort to eliminate learners who were formally exposed to the targeted forms before the experiment. A larger number of participants in each cell will improve the robustness of the findings.

While the present study investigated one area of the future research agenda suggested in Leow (2001a), namely, the effects of linguistic types on noticing and L2 learning, this study tested only learners' perceptive linguistic

ability (recognition and comprehension) unlike Leow (2001a) who tested both perceptive and productive abilities. Use of assessment tasks that evaluate both perceptive and productive abilities may provide us with a more comprehensive picture of the effects of independent variables on L2 learning.

Of the ten targeted verbs in the reading passage, four of the targeted verbs in the present perfect passage and six in the present subjunctive passage might be considered cognates. As factors such as prior knowledge and familiarity with input may influence learners' noticing (Gass, 1988, 1997; Harley, 1994), English cognates and non-cognates may differently appeal to learners' attention. Targeted items need to be better controlled in future research in order to single out independent variables that are of interest to the researcher.

Another issue to be investigated in future research is the possible effect of multiple exposures to a reading passage containing the targeted forms (e.g., Leow, 1998b). Most of the studies on textual enhancement have exposed learners to such (un)enhanced input only once. The greater amount of exposure time may be needed for learners to notice linguistic forms in a reading passage at a higher level of awareness.

Pedagogical Implications

Although the present study did not provide empirical evidence to encourage use of traditional textual enhancement devices over non-textually enhanced input to promote noticing, intake, and comprehension, it provided further empirical evidence for a significant correlation between reported noticing of targeted forms and learner intake. This finding suggests that language teachers be aware of the role of noticing in the processing of incoming L2 input, leading to L2 development. It is, thus, highly advisable to construct language instruction, classroom activities and tasks in a way that effectively promotes learners' noticing of the targeted form while interacting with L2 input (Leow, 2001a).

Conclusion

By employing think-aloud protocols, the study addressed the internal validity of studies conducted within an attentional framework, namely, how to operationalize and measure learners' attention during exposure to L2 written input.

The results indicated no significant benefit of textual enhancement over unenhanced input for (1) the amount of reported noticing of Spanish present perfect or present subjunctive forms, (2) learners' intake of the forms, or (3) learners' comprehension of the reading passage. The study did indicate a significant benefit of more salient forms (present perfect) over less salient forms (present subjunctive) for (1) the amount of reported noticing of the targeted verb forms, but not for (2) learners' intake or (3) learners' comprehension. Overall, the significant relationships found between reported noticing of targeted forms and subsequent processing of these forms provide further

support for the role of noticing in L2 development as claimed by Schmidt's noticing hypothesis.

Notes

[1]Intake is defined as "that part of the input that has been attended to by second language learners while processing the input. Intake represents stored linguistic data that may be used for immediate recognition and does not necessarily imply language acquisition" (Leow, 1993, 334).

[2]Cf. Leow (1999a) for a more detailed discussion of the role of attention in SLA.

[3]The role of awareness in SLA has been empirically addressed in several recent studies (e.g., Leow, 1997b, 2000, 2001b; Rosa 1999; Rosa & O'Neill 1999). The findings have indicated that awareness contributes to subsequent processing of grammatical information in the input and that higher levels of awareness lead to more learning (cf. Leow 1997b, 1999a, 2000, 2001b for a more detailed discussion of the role of awareness in SLA).

[4]Based on the relatively low scores obtained on the delayed tests in Leow's (2001a) study, the issue of delayed effects was not pursued in this study.

[5]The distinction between type of processing based on task type while interacting with L2 data is referred to in cognitive psychology literature as integrative processing (e.g., Graf, 1994). According to Graf (p. 685), "[I]ntegration focuses on connections among the units that define an individual item, such as a word, an object, or a sentence; these kinds of connections are formed or strengthened when the subject either perceives coherence among separate stimulus components (e.g., under the guidance of preexisting representations or gestalt laws like proximity or common fate) or conceives a structure for processing targeted features as a single entity."

[6]The notion of different levels of processing, for example, translation versus conceptually driven processing, may be similar to Craik and Lockhart's (1972) notion of "depth of processing." They define "depth" in terms of the relative degree of semantic and cognitive analysis and elaboration performed on the L2 data.

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, Second Language Teaching and Curriculum Center.

Bardovi-Harlig, K. (1987). Markedness and salience in second language acquisition. *Language Learning*, *37*, 385-407.

Bowles, M. (forthcoming). The effects of textual enhancement on language learning: An Online/offline study of fourth-semester students. In P. Kempchinsky & J. Lispin-Gasparro (Eds.), *Proceedings from the 5th Conference on the Acquisition of Spanish & Portuguese as a First and Second Language*. Summerville, MA: Cascadilla Press.

Carr, T. H., & Curran, T. (1994). Cognitive factors in learning about structured sequences: Applications to syntax. *Studies in Second Language Acquisition*, *16*, 205-30.

Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum.

Collentine, J. (1997). The effects of irregular stems on the detection of verbs in the subjunctive. *Spanish Applied Linguistics, 1*, 3-23.

Craik, F., & Lockhart, R. (1972). Levels of processing: A framework for memory research. *Journal of Verbal Learning and Verbal Behavior, 11*, 671-684.

Gass, S. (1988). Integrating research areas: A framework for second language studies. *Applied Linguistics, 9*, 198-217.

Gass, S. M. (1997). *Input, interaction, and the second language learner*. Mahwah, NJ: Lawrence Erlbaum Associates.

Graf, P. (1994). Explicit and implicit memory: A decade of research. *Attention and Performance, 15*, 681-696.

Greenslade, T., Bouden, L., & Sanz, C. (1999). Attending to form and content in processing L2 reading texts. *Spanish Applied Linguistics, 3*, 65-90.

Harley, B. (1994). Appealing to consciousness in the L2 classroom. *AILA Review, 11*, 57-68.

Hatch, E., & Lazaraton, A. (1991). *The research manual: Design and statistics for Applied Linguistics*. Boston, MA. Heinle and Heinle.

Izumi, S. (1999). *Promoting noticing and SLA: An empirical study of the effects of output and input enhancement on ESL relativization*. Unpublished doctoral dissertation, Georgetown University.

Jourdenais, R. (1998). *The effects of textual enhancement on the acquisition of the Spanish preterit and imperfect*. Unpublished doctoral dissertation, Georgetown University.

Jourdenais, R., Ota, M., Stauffer, S., Boyson, B., & Doughty, C. (1995). Does textual enhancement promote noticing?: A think aloud protocol analysis. In R. W. Schmidt (Ed.), *Attention and awareness in foreign language learning* (pp. 183-216). Honolulu, HI: University of Hawai'i, Second Language Teaching and Curriculum Center.

Leow, R. (1993). To simplify or not to simplify: A look at intake. *Studies in Second Language Acquisition, 15*, 333-355.

Leow, R. (1995). Modality and intake in SLA. *Studies in Second Language Acquisition, 17*, 79-89.

Leow, R. (1997a). The effects of input enhancement and text length on adult L2 readers' comprehension and intake in second language acquisition. *Applied Language Learning, 8*, 151-82.

Leow, R. (1997b). Attention, awareness, and foreign language behavior. *Language Learning, 47*, 467-506.

Leow, R. (1998a). Toward operationalizing the process of attention in SLA: Evidence for Tomlin and Villa's (1994) fine-grained analysis of attention. *Applied Psycholinguistics, 19*, 133-59.

Leow, R. (1998b). The effects of amount and type of exposure on adult learners' L2 development in SLA. *Modern Language Journal, 82*, 49-68.

Leow, R. (1999a). Attention, awareness, and focus on form research: A critical overview. In J. F. Lee, & A. Valdman (Eds.), *Meaning and form: Multiple perspectives* (pp. 69-98). Boston, MA: Heinle and Heinle.

Leow, R. (1999b). The role of attention in second/foreign language classroom research: Methodological issues. In F. Martínez-Gil, & J. Gutiérrez-Rexach (Eds.), *Advances in Hispanic Linguistics: Papers from the 2nd Hispanic Linguistics Symposium* (pp. 60-71). Somerville, MA: Cascadilla Press.

Leow, R. (2000). A study of the role of awareness in foreign language behavior: Aware vs. unaware learners. *Studies in Second Language Acquisition, 22*, 557-84.

Leow, R. (2001a). Do learners notice enhanced forms while interacting with the L2 input? An online and offline study of the role of written input enhancement in L2 reading. *Hispania, 84*, 496-509.

Leow, R. P. (2001b). Attention, awareness and foreign language behavior. *Language Learning*, *51*, 113-155.

Mackey, A., Gass, S., & McDonough, K. (2000). How do learners perceive interactional feedback? *Studies in Second Language Acquisition, 22*, 471-497.

McLaughlin, B. (1987). *Theories of second language learning*. London: Edward Arnold.

Overstreet, M. H. (1998). Text enhancement and content familiarity: The focus of learner attention. *Spanish Applied Linguistics, 2*, 229-58.

Robinson, P. (1995). Review article: Attention, memory, and the Noticing Hypothesis. *Language Learning, 45*, 283-331.

Robinson, P. (2003). Attention and memory during SLA. In C. Doughty, & M. Long (Eds.), *Handbook of research in second language acquisition*. Oxford: Blackwell.

Rosa, E. (1999). *A cognitive approach to task-based research: Explicitness, awareness, and L2 development*. Unpublished doctoral dissertation, Georgetown University.

Rosa, E., & O'Neill, M. (1999). Explicitness, intake, and the issue of awareness: Another piece to the puzzle. *Studies in Second Language Acquisition, 21*, 511-56.

Schmidt, R. W. (1990). The role of consciousness in second language learning. *Applied Linguistics, 11*, 129-158.

Schmidt, R. W. (1993). Awareness and second language acquisition. *Annual Review of Applied Linguistics, 13*, 206-226.

Schmidt, R. W. (1995). Consciousness and foreign language learning: A tutorial on the role of attention and awareness in learning. In R. W. Schmidt (Ed.), *Attention and awareness in foreign language learning* (pp. 1-63). Honolulu, HI: University of Hawai'i, Second Language Teaching and Curriculum Center.

Schmidt, R. (2001). Attention. In P. Robinson (Ed.), *Cognition and second language instruction* (pp. 3-32). New York: 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, 17*, 118-36.

Shook, D. J. (1994). FL/L2 reading, grammatical information, and the input-to-intake phenomenon. *Applied Language Learning, 5*, 57-93.

Shook, D. J. (1999). What foreign language reading recalls reveal about the input-to-intake phenomenon. *Applied Language Learning, 10*, 39-76.

Simard, D., & Wong, W. (2001). Alertness, orientation, and detection. *Studies in Second Language Acquisition, 23*, 103-124.

Tomlin, R. S., & 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: An experiment in consciousness. *Studies in Second Language Acquisition, 12*, 287-301.

White, J. (1998). Getting the learners' attention: A typographical input enhancement study. In C. Doughty, & J. Williams (Eds.), *Focus on form in classroom second language acquisition* (pp. 85-113). Cambridge: Cambridge University Press.

Williams, J., & Evans, J. (1998). What kind of focus and on which forms? In C. Doughty, & J. Williams (Eds.), *Focus on form in classroom second language acquisition* (pp. 139-155). Cambridge: Cambridge University Press.

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Textual Enhancement and Simplified Input: Effects on L2 Comprehension and Acquisition of Non-meaningful Grammatical Form

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The study set out to investigate how textual enhancement (TE) as a form of input enhancement and increasing the comprehensibility of input via simplified input (SI) might impact adult L2 French learners' acquisition of the past participle agreement in relative clauses and their comprehension of three texts in which the target forms were embedded. Four groups of second semester learners of French were exposed to one of four conditions: (1) TE and SI; (2) no TE and SI; (3) TE and no SI; and (4) no TE and no SI. Acquisition was assessed via an error correction task and comprehension was assessed via free recall tasks that measured total idea units recalled and enhanced idea units recalled.

The results for acquisition demonstrated that TE and SI did not help learners acquire the target form. However, the results for comprehension revealed that while TE had no effect on total idea units in the texts, TE aided recall of the enhanced information in the texts. Additionally, it was observed that participants who read the simplified versions of the texts had higher comprehension recall scores. An important implication of the study is that the type of enhancement used in TE studies needs to be carefully examined. The question of whether some techniques are more effective at pushing learners to process cued information for content whileothers may be better suited at drawing attention to form was considered.

The field of second language acquisition (SLA) is witnessing an increasing interest in the idea that drawing learners' attention to the formal features of second language (L2) input is beneficial, and in some cases necessary, for optimal L2 development. This interest has challenged researchers to develop pedagogic techniques that enhance input, and has resulted in a large body of research on input enhancement. A term coined by Sharwood Smith (1991, 1993), input enhancement refers to deliberate attempts to make specific features of L2 input more salient. In so doing, it is hoped that learners will be more likely to notice targeted forms, resulting in more intake, the subset of the input data that becomes available for further language processing.

A type of input enhancement that has received some attention in the SLA literature (Alanen, 1995; Jourdenais, Ota, Stauffer, Boyson & Doughty, 1995; Shook, 1994, 1999; Leow, 1997, 2001; Overstreet, 1998; White, 1998) is textual enhancement (TE). Textual enhancement has two minimal characteristics: (1) learners are engaged in reading written input for propositional content and (2) particular features of the written input are enhanced via the use of typographical cues with the hope that the learners' attention is drawn to these. The typographical manipulation may involve changing the font style, enlarging the character size, underlining, bolding, using italics, highlighting with color or any combination of these (Wong & Simard, 1999). The goal of TE is to render more salient targeted features of written input that are not perceptually salient so that learners will be more likely to pay attention to these elements.

The contribution of TE to SLA, however, is presently not clear. When enhanced conditions were compared with unenhanced conditions, some studies demonstrated significant effects for TE (Jourdenais et al., 1995; Shook, 1994), some reported no effect for TE (Leow, 1997, 2001; Overstreet, 1998) and others reported only partial effects for TE (Alanen, 1995; White, 1998). These conflicting findings make it difficult to understand how TE might or might not impact SLA. Furthermore, some questions regarding the potential benefit this technique may have on SLA have not been adequately addressed. First, the linguistic features that most studies have selected to enhance in existing TE research contain some degree of semantic value. With the exception of Shook (1994, 1999) who investigated the effects of TE on the relative pronoun "que" in Spanish, there is little information in the research literature to address how TE might impact the acquisition of forms that are very low in or have no communicative value, forms that may be the most difficult for learners to attend to on their own (VanPatten, 1996, 2000). Second, the bulk of the TE research to date has investigated the impact of TE on learners' acquisition of form only. Not all TE studies have examined how drawing learners' attention to form might affect how they process the input for meaning and by extension, how increasing the comprehensibility of L2 input might impact how learners pay attention to meaning and to form.

The present study set out to address these limitations and to offer a more complete picture of how TE might contribute to SLA. Specifically, the study investigates how TE as a form of input enhancement and increasing the comprehensibility of L2 input via simplified input (SI) might impact adult L2 French learners' acquisition of non-meaningful grammatical form and their comprehension of three texts in which the target forms were embedded.

Background and Motivation for Present Study

Textual Enhancement

Theoretical Justification for TE

It is generally believed that attention to L2 input is a necessary condition for L2 learning (e.g., Robinson, 1995a, 1995b, 1996; Schmidt, 1990, 1993, 1994, 1995, 2001; Tomlin & Villa, 1994). Furthermore, there exists empirical stud-

ies to demonstrate that increased attention to form can lead to more learning (e.g., Huot, 1995; Leow, 1997, 1998; Robinson, 1996; Rosa & O'Neill, 1999; Schmidt & Frota, 1986). Thus, increasing the perceptual salience of specific features of language may be beneficial in that it may help learners pay more attention to form.

TE and L1 Research

There is evidence in first language (L1) research to demonstrate that the use of typographical cues, particularly underlining, can have positive effects on perception and recall of cued information. Schnell and Rocchio (1974, 1978), for example, found that underlined information in a written passage, whether done by students or by instructors, resulted in increased immediate and delayed recall of that information. Golding and Fowler (1992) also found that participants recalled information that was underlined in a text better than information that was not underlined. Additionally, Lorch, Lorch and Klusewitz (1995) found positive effects for underlining and the use of capitalization on comprehension recall. Other L1 studies that have found similar results include Crouse and Idstein (1971), Hartley, Barlett and Branthwaite (1980), Leicht and Valjean (1972) and Lorch (1982).

TE and L2 Research

In L2 research, most researchers have examined the impact of this technique on L2 learners' acquisition of form only and the findings are mixed. Alanen (1995) examined the effects of TE and explicit rule presentation on the acquisition of semi-artificial locative suffixes and consonant gradation in Finnish. A sentence completion task revealed that TE as a variable by itself did not have a substantial effect on learners' acquisition of the target forms. Jourdenais et al. (1995) examined the effects of TE on Spanish learners' ability to detect Spanish preterit and imperfect verbs and found that TE promoted detection of the target items and had an effect on learners' subsequent output as measured by an essay production task. Shook (1994) investigated the effect of TE on L2 Spanish learners' intake of the present perfect and the relative pronouns *que/quien* measured by a recognition task and a fill-in-the blank production task. Overall, results revealed that participants who received TE performed significantly better than the control group on all tasks. Additionally, the type of linguistic item appeared to have an effect on the results. Subjects performed better on the present perfect tests than on the relative pronoun tests. White (1998) investigated the effect of TE on 6th-grade French-speaking children's ability to use possessive determiners in English. Results of a picture description task revealed that while TE appeared to have increased the frequency of use of the target forms, it did not have an effect on subjects' ability to use them correctly.

Four studies have examined the potential effects of TE on both meaning and on form: Leow (1997), Overstreet (1998), Shook (1999) and Leow (2001).

Leow (1997) examined the effect of TE and text length on L2 Spanish learners' comprehension of text content and intake of the impersonal imperative forms of Spanish verbs. Leow found a main effect for text length on comprehension measured via a short-answer comprehension task but there was no significant effect for TE when compared to an unenhanced condition on either comprehension or intake.

Overstreet (1998) looked at the effect of content familiarity and TE on L2 Spanish learners' intake of the preterit and imperfect tenses in Spanish and their comprehension of passage content. Overstreet did not find positive effects for either content familiarity or TE on intake but found a negative effect for TE on comprehension as measured by a true/false test.

Shook (1999) examined the effects of TE on intake and comprehension by analyzing the recall data that was collected in Shook (1994) (which had not been analyzed in the 1994 study). The target structures were the present perfect and the relative pronouns *que/quien* in Spanish. The reading recall data were analyzed for overall number of idea units recalled and for number of grammatical tokens recalled in the idea units. Results revealed that subjects who read the text that contained the relative pronouns recalled significantly more idea units than subjects who read the text that contained the present perfect structure. No significant effect was found, however, for either TE or instruction to pay attention to the enhancement. For the recall of grammatical tokens (target idea units), subjects with the present perfect text recalled more target idea units while subjects with the relative pronoun text recalled more nontarget idea units. No effect was found for either TE or instruction to pay attention.

In a more recent study, Leow (2001) used both on-line and off-line procedures to measure the potential effects of TE on Spanish L2 learners' comprehension and on their noticing and intake of Spanish formal imperatives. On-line think-aloud protocal data showed that subjects did indeed notice the target forms but there was no statistical difference for the amount of noticing between subjects who read the enhanced texts and those who read the unenhanced texts. A multiple choice recognition task revealed a significant correlation between reported noticing and recognition of target forms for both the enhanced and the unenhanced groups but there was no significant difference between the two groups. As for comprehension, no significant difference was found for the two groups on a multiple-choice an short-answer task.

To summarize, while Leow (1997, 2001) and Shook (1999) did not find any effects for TE on comprehension, Overstreet (1998) found that TE negatively affected comprehension. Overstreet speculates in his discussion that it is possible that the target forms in his study (i.e., Spanish preterit and imperfect) were salient enough to draw subjects' attentional resources away from processing the texts for meaning. More research is needed in order to adequately address this possibility.

TE and the Acquisition of Non-Meaningful Grammatical Form

As mentioned earlier, many of the linguistic features that current TE

studies have chosen to enhance all contain some degree of semantic value (e.g., verb forms and tenses) and the results have been mixed. With the exception of Shook (1994, 1999), not many studies examined how this type of input enhancement might impact the acquisition of forms that have no communicative value, that is to say, forms that have no inherent semantic value and therefore do not contribute to the referential meaning of a sentence or utterance (Bransdorfer, 1991; VanPatten, 1996, 2000). It has been proposed by VanPatten's model of input processing (VanPatten, 1996, 2000) that these forms are the most difficult to acquire. According to the model, because learners have a limited capacity to process input and because learners tend to try to understand the propositional content of the message before paying attention to how that message is encoded linguistically, they will pay attention to more meaningful features of the input before less meaningful ones, that is to say, those that are lower in communicative value. Thus, we can speculate that grammatical forms of little or no communicative value will be processed much later by L2 learners and by extension, we could posit that these forms may stand to benefit the most from enhancement. Furthermore, in a personal communication (June, 1998), R. Lyster pointed out that since TE increases the perceptual salience of linguistic features, clearest effects for this type of enhancement technique perhaps may be observed with forms that are not inherently perceptually salient. Lyster proposed that if the target form is already salient, visually enhancing that form may not render it much more salient than it already is. However, if the form is not inherently salient, then there is greater potential for TE to have an impact on increasing its perceptual salience. Because not much TE research has focused on forms of low or of no communicative value, this possibility remains speculative. The grammatical form that the present study selected to enhance is a form that has no communicative value, the French past participle agreement in relative clause constructions.

TE and Attention to Meaning and to Form

The fact that few TE studies have included a measure of comprehension in research designs may be perceived as a lacuna in the research literature because acquisition is tied to the act of comprehension. Because input is something that must be comprehended in order for acquisition to occur (Gass, 1997; Gass & Selinker, 1994; Long, 1981, 1983; VanPatten, 1994, 1996, 2000), the role of TE in SLA cannot be complete without information about how comprehension is affected (or not affected) as learners' attention is directed at form. Furthermore, there is evidence in the research literature to suggest that there may be an inverse relationship between learners' ability to attend to meaning and to form, particularly when the form is low in communicative value. In the aural mode, VanPatten (1990) and Bransdorfer (1991) found that when participants had to attend to a passage for both meaning and to a grammatical form of low communicative value, they recalled less passage content than when they had to attend to a content word that was high in communicative value. Greenslade, Bouden, and Sanz (1999) replicated VanPatten's (1990) study in the written mode and found similar results. More recently, Wong (2001) repli-

cated VanPatten's study in both the aural and written modes and found that while attention to a grammatical form of low communicative value impeded comprehension in the aural mode, this phenomenon was not observed in the written mode. Wong (as well as Leow, 1995) concluded that attention to meaning and form may not be constrained in the same way in the written and aural modes. While this tension seems to be prevalent in the aural mode, it is less clear in the written mode warranting further investigation. The present study includes comprehension as a variable in order to address how comprehension of written input may be affected when learners' attention is directed at form.

Simplified Input

Theoretical Justification for SI

VanPatten's model of input processing postulates that in order for learners to process form that is not important for understanding the referential meaning of messages, that is to say, forms that have low or no communicative value, learners must be able to process informational content at no or little cost to attention. This suggests that increasing the comprehensibility of input may help learners attend to the input for form. If learners do not need to exert a great deal of effort to process input for meaning, they may have enough attentional resources left over to enable them to attend to form that is less or not meaningful.

Some researchers have proposed that input could be made more comprehensible through input simplification (e.g., Hatch, 1983; Omaggio, 1986). Hatch (1983) provides one of the first detailed descriptions of the types of linguistic simplification that render input more comprehensible. These features include using high frequency vocabulary, using fewer pronouns and idioms, using simple syntax, repetition and restatement of ideas.

L2 Research on Written SI and Comprehension

SLA research on written SI has primarily investigated how simplifying input might promote L2 comprehension. These studies include Blau (1982), Brown (1987), Long and Ross (1992), Parker and Chaudron (1987) and Yano, Long and Ross (1994). Overall, this research suggests that some form of modified input, either linguistically simplified or elaborated input or both, can have facilitative effects on L2 comprehension of written input.

L2 Research on Written SI and Intake of Form

Only one study, Leow (1993) has addressed the question of how simplifying L2 written input might affect how learners process input for form. Leow did not find, however, that input simplification has a significant impact on intake of form. Because no other study has looked at the impact of simplified written input on intake, the jury is still out regarding the role of input simplification and acquisition. The present study includes SI as a variable to examine how increasing the comprehensibility of input, either by itself or in conjunction with TE, might impact acquisition of grammatical form.

TE Research and Assessment Tasks

Assessment tasks used to measure acquisition in TE studies include grammaticality judgment tasks (Alanen, 1995), multiple-choice tasks (Leow, 1997, 2001; Shook, 1994; White, 1998), sentence completion tasks (Alanen, 1995), fill-in-the-blank production tasks (Shook 1994; Leow, 2001), circle-the-verb tasks (Overstreet, 1998), picture narration tasks (Jourdenais et al., 1995; Overstreet, 1998; White, 1998), error correction tasks (White, 1998), and think-aloud protocols (Alanen, 1995, Leow, 2001). In the present study, an error correction task was used to measure acquisition. This task required participants to read six mini-stories consisting of six sentences in each story. Participants were told that some of the sentences were correct and that some contained errors. They had to circle the letter (A, B, C or D) of the sentence that contained an error and then correct the error by crossing out and/or adding letters. This task is similar to a grammaticality task in that participants had to judge if a sentence was acceptable or not. The advantage of this task was that by asking participants to supply the correct form to the incorrect sentences, guessing was not possible. Another advantage of this task was that it allowed context to be included in the test and matched more closely the task participants had to perform during the treatment phase. Participants were required to read three texts during treatment. The format of the error correction task required participants to read sets of contextualized sentences that resembled mini-stories so that this task more closely matched what participants were required to do during the learning phase.[1]

Comprehension was assessed via the same type of free recall task as used in Shook (1999). This task was chosen because it most effectively permitted the researcher to measure both the amount of total information and the amount of enhanced information participants could recall on their own.

Overview of the Study

The aim of the current study was to investigate how TE and SI might impact adult L2 French learners' acquisition of the past participle agreement in relative clauses and their comprehension of three texts in which the target forms were embedded. Eighty-one participants were randomly assigned to one of four conditions: (1) exposure to TE and SI, (2) exposure to SI only, (3) exposure to TE only, and (4) exposure to unsimplified input without TE (comparison group). TE was operationalized as providing participants with three reading texts in French in which the target forms were typographically altered to enhance their perceptual salience. SI was operationalized as providing participants with simplified versions of three reading texts. Acquisition was measured via an error correction task that required learners to read sets of contextualized sentences, to recognize errors in some sentences and to provide the correction to the incorrect sentences. Comprehension was assessed using three free recall tasks of text content, one for each of the three texts.

Research Questions

The research questions that guided this study were the following:

1. Does TE have an effect on acquisition of the past participle agreement as measured by an error correction task?
2. Does SI have an effect on acquisition of the target form as measured by an error correction task?
3. Does TE have an effect on comprehension as measured by free recall tasks? If so, on what parts of the text?

    a. Total idea units in the texts?
    b. Enhanced idea units in the texts?

4. Does SI have an effect on comprehension as measured by free recall tasks?
5. Is there an interaction between TE and SI for either acquisition or comprehension as described above?

Method

Participants

Participants were initially 188 English speaking L2 second semester learners of French from 11 intact classes from two universities in the Midwest. The approach used at both institutions was similar; both focused on the development of listening, reading, speaking and writing, and used a communicative approach that also included a focus on form.[2] Participants had not received any formal exposure to the target structures before the start of this experiment. Furthermore, they were never formally instructed on the target form at any time in the classes that were used for this study.

In order to be included in the final subject pool, participants had to have been present for all phases of the experiment and had to have scored lower than 50% on the pretest. No subject scored above 50% on the pretest. However, 107 subjects did not complete all phases of the experiment and were consequently removed from the study. The final subject pool for this study was 81 participants (University 1: n=46; University 2: n=35).

Target Forms

The target form selected for the study was the French past participle agreement in relative clauses. This form may be classified as a form of no communicative value because it has no inherent semantic value. In French, when sentences are in the simple past tense (*passé composé*), the past participle must agree in gender and number with other parts of the sentence in certain cases. One of these cases is when the relative pronoun *que* (that) is used as a direct object of a dependent clause in the past tense as in sentence B:

A. Caroline a acheté la tarte. Ma mère a fait la tarte.
   Caroline bought the pie. My mother made the pie.
B. Caroline a acheté la tarte que ma mère a fait*e*.
   Caroline bought the pie that my mother made.

In B, the relative pronoun *que* connects the two sentences in A. Note that in sentence B, there is a marker "e" at the end of the past participle *faite*. Because *que* represents *la tarte* and *la tarte* is feminine and singular, it is necessary to add an "e" to the past participle. However, as can be observed, the agreement of the past participle does not contribute to the propositional content of the sentences in any way. Adding or removing the agreement marker "e" would not alter the meaning of the sentence. In other words, learners do not need to attend to the form to process the sentence for meaning. Thus, this form may be classified as a form of no communicative value.

Materials

The following materials were used to conduct this study: a consent form and language background questionnaire; instructions to instructors; a pretreatment reading comprehension task; two versions of an error correction task (Appendix A); four versions of three texts (Appendices B & C, only the (-S, -E) and (+S, +E) versions of text 1 are shown); posttreatment free recall task for each text read (Appendix D); and a debriefing questionnaire.

Pretreatment Reading Comprehension Task

The purpose of this task was to ensure that reading ability between groups was not significantly different before treatment. Participants read a passage (469 words) from a popular French language magazine from Quebec about a television personality's experience in Italy and were then asked to recall everything they could remember from the text.

Error Correction Task

This task contained six groups of mini stories with six sentences in each group. Two sentences in each group were target sentences and the other four were distractor items. Participants had to read the sentences, circle the letter of the sentence that contained an error and then correct the error by crossing out and/or adding letters. A total of 12 target errors were in this task. One version of this task was used as a pretest and the other as a posttest.

Texts

Three reading passages were selected to provide the written input which presented the target items to the participants. The texts came from a French language magazine from Quebec, *7 Jours*. The first text (526 words) was about an accident that a political figure in Quebec had when she was 13 years old; the second text (465 words) was about an Italian race car driver's childhood and present career; and the third text (517 words) was about the profes-

sional career of a young television personality in Quebec. These texts were selected because the content was not likely to be familiar to participants and because the target structure was relatively easy to embed in these texts. Modifications were made to the original texts in order to be able to embed the target structure. The modifications included omitting certain sections of longer texts and altering verbs so that the target structure could be embedded in each text. For each text, there was a total of 16 sentences that contained the target linguistic form, half of the sentences contained the marked feminine past participle agreement and the other half the unmarked masculine past participle agreement. There was a total of four versions for each of the three texts: (1) textually enhanced and simplified; (2) unenhanced and simplified; (3) textually enhanced and unsimplified; and (4) unenhanced and unsimplified (see Appendices B & C for examples).

Text simplification was carried out using two procedures. The researcher first simplified the texts using Hatch's (1983) guidelines for SI as a guide. The simplified versions were then given to participants in two focus groups for comment and to modify and/or simplify further if deemed necessary. The types of simplification that the final version included were the elimination of idioms and difficult vocabulary, the glossing of vocabulary items, using some shorter and simpler sentence constructions and some restatements of ideas. In some cases, these modifications resulted in simplified texts that were slightly longer than the unsimplified versions. A summary of passage lengths for the simplified and unsimplified versions are presented in Table 1.

Table 1. *Passage Length Summaries for Unsimplified and Simplified Versions.*

	Text 1 *"Lise Thibaut..."*	*Text 2* *"Alexandre Tagliani..."*	*Text 3* *"Tout le Quebec..."*
Unsimplified	526 words	465 words	517 words
Simplified	511 words	469 words	530 words

TE was done by retyping the target forms in a larger 16 point font (normal font was 12) and by bolding, italicizing and underlining the entire structure. Each target relative clause was underlined. Additionally, the article of the direct object that introduced the clause and the respective past participle agreement was enlarged, bolded and italicized in an attempt to draw attention to the relationship between the gender of the direct object and the corresponding necessary agreement: la *ville que j'ai vu*e.[3]

Posttreatment free recall comprehension tasks

After reading a text, participants were asked to recall in English as many ideas as they could from the text. They performed this task after reading each of the three texts.

Debriefing questionnaire

This questionnaire asked participants if they noticed any bolding, underlining or italicized words in the text.[4]

Procedure

All data were collected in the participants' regular classrooms by their regular instructors according to the following procedures:

1. Participants were randomly assigned to receive one of four treatment packets, each packet containing one of four versions of the three texts. On the first day of the study, participants completed the consent form, background questionnaire, the reading comprehension pretest and the error correction pretest.
2. Two weeks later, packets were returned to participants. Participants were asked to turn to their first text and were given 10 minutes to read their experimental text and another 10 minutes to do the recall task. They were told to write in English as many ideas they could recall from the text and then hand in their packets to their instructors.
3. A day later, instructors handed back the packets to the participants. They were given 10 minutes to read their second text, another 10 minutes to do the free recall task and then returned the packets to their instructors.
4. On the last treatment day, instructors returned the packets to participants. Participants had 10 minutes to read their third text, another 10 minutes to do the free recall task and then had 20 minutes to do the error corrections task. Following the error correction task, they were given the debriefing questionnaire to check in they had noticed any typographical cues in their texts. Packets were returned to instructors who then returned them to the researcher.
5. Participants were not given any additional exposure to the target structure at any point during treatment and testing. In fact, the target structure was never explicitly taught in the curriculums of the classes used in

this study. As an added measure of security, instructors were also explicitly told not to explain the target structure to students before the experiment was over in the event that any student should ask.

Scoring

Only the target items were scored on the error correction task. The maximum score was 12. One point was awarded if a participant indicated that the sentence contained an error and if the error was corrected. No points were awarded if the error was not corrected properly.

The free recall tasks were scored according to the number of idea units recalled and were based on a predetermined list of idea units for each text. Loosely following Carrell's (1985) procedure, idea units were based on syntactic and semantic features of the texts. All idea units lists were created by the researcher. A list was made for the simplified and unsimplified versions of each of the three texts (see Appendices E & F). The recall tasks were scored by the researcher using partial blind scoring.[5] Because there was a different list of idea units for the simplified and unsimplified versions, full blind scoring was not possible. When scoring the free recalls, the researcher was aware of whether participants had the simplified or unsimplified version but not whether they read the enhanced or unenhanced versions.

Two scores for each of the three texts were obtained for a total of six separate scores. One score was determined for the total number of idea units that were recalled from each text, and a second score was determined for the number of idea units recalled that were enhanced in the treatment texts. Recall scores from the three texts were then added together to create one total score for the number of total idea units recalled and one total score for the number of enhanced idea units recalled. Thus, each participant had two posttreatment comprehension scores: a score for the number of total idea units recalled from the three texts and a score for the total number of enhanced idea units recalled from the three texts. Each score consisted of the raw number of idea units recalled. The maximum possible score for the total idea units was 276, and the maximum score for the enhanced idea units was 51.

Analysis

In order to determine the effects of TE and SI on participants' comprehension and acquisition, the data were submitted to a series of analyses of variance (ANOVAs). Data from the error correction task at time one and time two were submitted to a two-way mixed-design ANOVA with repeated measures. The between subjects factor were TE and SI and the within-subjects factor was time. Data from the pretreatment comprehension task and the posttreatment comprehension tasks (for overall idea units and enhanced idea units recalled) were each submitted to separate ANOVAs.

Results

Acquisition

The means for condition ([+TE,+S]; [-TE, +S]; [+TE, -S]; [-TE, -S]) at time one (pretest) and time two (posttest) for acquisition are displayed in Table 2. These two tables reveal that the mean scores were higher from the time of the pretest to the time of the posttest regardless of the treatment the participants received. Results of the repeated measure ANOVA revealed that there was no significant main effect or interaction for either TE or SI on acquisition. However, there was a significant main effect for time ($F = 15.79$, $p = .00$), confirming that participants in all treatment groups performed better on the posttest than on the pretest.

Table 2. *Means for Condition for Acquisition at Time One and Time Two*

			Time One		*Time Two*	
Condition		*N*	*Mean*	*SD*	*Mean*	*SD*
+TE	+SI	22	2.00	1.93	2.91	1.82
-TE	+SI	20	1.85	2.06	2.55	1.47
+TE	-SI	20	1.85	2.03	2.65	1.84
-TE	-SI	19	1.63	1.98	2.21	1.8

Possible Range: 0-12

Comprehension

The ANOVA conducted on the pretreatment recall data revealed no significant main effects ($F = .04.$, $p = .84$) demonstrating that there were no significant differences in the comprehension scores between groups before treatment.

There were two scores for the posttreatment comprehension tasks, one for the total idea units recalled from all three texts and one score for the enhanced idea units recalled from all three texts.

The means for condition for total idea units recalled for the posttreatment comprehension tasks are displayed in Table 3. The ANOVA conducted on the total idea units recalled revealed a significant main effect for SI ($F = 69.65$, $p = .00$). To determine the source of the significant main effect, a post hoc test was conducted using Fisher's PLSD. This analysis revealed that the main effect for SI ($p < .01$) was due to the participants who received the simplified versions of the text recalling more total idea units than those in the -SI condition. No other significant main effects or interactions were found for total idea units recalled.

Table 3. *Means for Condition and Total Idea Units Recalled (Posttreatment)*

Condition		*N*	Mean	SD
+TE	+SI	22	63.91	14.25
-TE	+SI	20	56.80	20.97
+TE	-SI	20	31.25	17.77
-TE	-SI	19	26.37	14.13

Possible range: 0-276

Table 4. *Means for Condition by Separate Variables for Enhanced Idea Units Recalled (Posttreatment)*

Condition		*N*	*Mean*	*SD*
+TE	+SI	22	7.64	3.97
-TE	+SI	20	4.60	3.18
+TE	-SI	20	4.40	2.96
-TE	-SI	19	3.53	3.45

Possible range: 0-51

The means for TE and enhanced idea units recalled are displayed in Table 4. The ANOVA for condition and enhanced idea units recalled revealed a main effect for TE on the number of enhanced idea units recalled ($F = 6.56$, $p = .01$). Fisher's PLSD showed that this main effect was due to the participants who received the typographically enhanced texts recalling more enhanced idea units than those who received the unenhanced versions of the texts ($p = .01$).

Discussion

With reference to the first research question, does TE have an effect on the acquisition of the past participle agreement as measured by an error correction task, our results suggest it does not. Increasing the perceptual salience of the target structure did not help the participants perform better on the error correction task that measured their knowledge of the structure. This finding may be attributed to several factors. First, the target structure that was typographically enhanced was a form of no communicative value. In other words, this form has no semantic value and plays no importance in determining the propositional content of the input. As discussed previously in relation to VanPatten's model of input processing, this type of form may be the most difficult to acquire (VanPatten, 2000). It may be that because the past participle agreement played no importance in decoding the meaning of the texts, participants had no incentive to attend to it. Or, if they did attend to it, noticing the forms was not sufficient to bring about any kind of change in their developing language system. As Sharwood Smith (1991, 1993) cautions, enhancing input only increases the chances that learners will select the input as intake. There is no guarantee that the enhanced input will be internalized by the learner (Sharwood Smith, 1991, p. 122). However, since this study could not include an on-line measure of noticing to determine what participants actually noticed, this conclusion remains speculative.

Another possible explanation for our results may be attributed to the type of typographical enhancement used. Enhancement in this study involved bolding and italicizing the definite article and the agreement of the past participle. The whole clause was then underlined to show the relationship (e.g.,La *femme que nous avons rencontré*e est ma professeure). It is possible that the underlining might have overpowered the italics and the bolding of the article and the agreement. Furthermore, as the results revealed, participants who read the enhanced texts recalled more enhanced idea units than those who read the unenhanced texts. In other words, readers who received the enhanced texts recalled the enhanced clauses better. Thus, it is possible that participants paid more attention to the whole clause and paid less attention or no attention to the italicized and bolded agreement. This possibility suggests a need to examine the enhancement technique itself more closely. Would the enhanced forms have been more salient if we had not underlined the entire clause?

One reviewer pointed out that another possible explanation for the lack of significant effect found for TE on acquisition could be due to the nature

of the instructions given to the participants. The instructions that accompanied each text told participants that they would have 10 minutes to read the text and that they would be asked to recall passage content. This reviewer suggested that since participants were not explicitly told that they had to pay attention to the target forms, it is possible that they were mostly processing the texts for propositional content only. Other TE studies that instructed participants to pay attention to passage content only include Alanen (1995), Jourdenais et al. (1995), Leow (1993, 1997), Overstreet (1998) and White (1998). It could be argued that Leow's (2001) study encouraged participants to pay attention to form in that he instructed participants to circle any unknown verb forms. However, no effect for TE was found on either acquisition or comprehension. Shook (1994, 1999) included "instruction to pay attention to form" as a variable in his studies but also found no effect for this variable. Future studies may want to more closely examine whether explicitly instructing participants to pay attention to form could have an impact on how participants process written input.

With regards to the second research question, does SI have an effect on the acquisition of the target form as measured by an error correction task, the answer is that it does not. Our results show that simplifying the input did not have any effect on learners' performance on the error correction task. This finding corroborates the results in Leow (1993) who found that participants who read the simplified texts did not perform better or worse on this test compared to those who read the unsimplified texts. This finding suggests that while comprehensible input may be a necessary condition for learning, it is not sufficient, a position also echoed by Sharwood Smith (1981, 1991, 1993) and VanPatten (1996, 2000). It is possible that while the simplified versions helped learners to recall more ideas from the text, it was still not simplified enough to have an impact on acquisition. In other words, the simplified versions may have been easier but may still require a lot of attentional resources to process.

The third research question asked if TE would have an effect on comprehension as measured by free recall tasks and if so, on what parts of the text? Our results revealed that TE did not have an effect on participants' recall of total idea units but did have a positive effect on recall of the enhanced idea units. The finding that TE did not affect the recall of total idea units corroborates the results of Shook (1999) and Leow (1997, 2001), who also found that TE did not have an effect on comprehension, but contradicts the results of Overstreet (1998), who found that TE had a negative effect on comprehension. Overstreet proposed that the negative effect in his was due to his target forms being salient enough to detract attention from comprehension. Leow (2001), however, using a think-aloud protocol found that while participants noticed the target forms in his study, this did not affect their comprehension of the text. In the present study, the type of enhancement used in the texts might help explain why TE did not interfere with learners' ability to process the texts for meaning. As mentioned previously, in addition to bolding, italicizing and enlarging the article and the agreement marker, the whole relative clause was underlined to show the relationship between gender and agreement. Because

the whole clause was underlined, learners might have been processing the enhanced information for content rather than for form. Therefore, comprehension would not be impeded. In fact, our results show that TE actually aided recall of the information that was enhanced. As discussed earlier, it is possible that participants processed the underlined clause as a whole for meaning but did not pay sufficient attention to the agreement marker that was bolded, italicized and enlarged. An on-line measure of attention such as the one used by Leow (2001) would help shed light on this possibility.

The finding that participants who read the enhanced texts recalled more enhanced idea units than those who read the unenhanced texts is consistent with L1 studies that have consistently reported better recall of typographically cued information, particularly with underlining (Crouse & Idstein, 1971; Golding & Fowler, 1992; Barlett & Branthwaite, 1980; Leicht & Valjean, 1972; Lorch, 1989; Lorch, Lorch & Klusewitz, 1995; Schnell & Rocchio, 1974, 1978). The enhancement technique used in the present study was similar to the techniques found in L1 research in that the entire relative clause that contained the past participle marker was underlined. Like the L1 studies, this study also demonstrates that typographical cuing helps readers to recall the enhanced information better.

The fourth research question asked if SI would have an effect on comprehension as measured by free recall tasks? The answer is positive. Participants who read the simplified versions of the texts recalled significantly more total and enhanced idea units than those who read the unsimplified texts, corroborating the findings of previous research on written input simplification (e.g., Davis, 1984; Long & Ross, 1992; Yano, Long & Ross, 1994).

The fifth research question asked if there would be an interaction between TE and SI for either acquisition or comprehension. Because no main effect was found for TE on acquisition, it was not possible to observe an interaction.

Limitations and Implications for Future Research

A strength of this study is that it set out to investigate the impact of TE on a grammatical form of no communicative value, a type of form that had not been previously investigated by many TE studies (with perhaps the exception of Shook 1994, who investigated a form of low communicative value, i.e., relative pronoun) in order to provide data on how input enhancement might or might not impact learners' processing of this type of form. However, in providing empirical data for this one type of form, the generalizability of this study's results is also limited. Furthermore, in order to investigate more adequately the role of communicative value in TE studies, research designs need to compare at least two types of forms, that is, one that is low in communicative value and another that is higher in communicative value (e.g., Shook, 1994). Because this study was only able to examine one form, we cannot be certain that the lack of effect found for TE on acquisition was due to the low communicative value of the form or to other variables in the study, such as the type of typographical

cues used. Therefore, future research needs to compare forms with different degrees of communicative value in order to isolate the effects of communicative value in input enhancement research. Furthermore, the fact that the present study did not find a positive effect for TE on the acquisition of the past participle agreement in relative clauses should not imply that this input enhancement technique will not be effective for helping learners acquire other features of an L2. A question that needs to be asked is whether the target forms that TE studies have selected to enhance are responsive to TE? The issue may be that research has not yet uncovered that aspect of SLA that most benefits from TE (F. Davidson, personal communication, March 28, 2000).

A further limitation is that it was not possible to use any kind of on-line measure to assess more adequately what participants were actually paying attention to when they read their texts. In this study, attention to the enhanced input was inferred from the results of the post exposure tasks. As pointed out by Leow (2000), post-exposure measurements do not provide information about what learners were actually paying attention to. For example, it is possible that the participants only paid attention to the underlined relative clauses and did not pay as much attention to the agreement markers that were italicized, bolded and enlarged. Future research that incorporates some kind of on-line measure of attention such as think-aloud protocols (e.g., Leow, 2001) and eye-movement trackers is needed and would help address this possibility. Data on exactly what learners do with enhanced input is needed in TE research. Future studies need to design tasks that will allow the researcher to both assess and enhance a text simultaneously.

The possibility proposed in this study that learners may have processed the underlined clauses deeper for meaning (as shown by the higher recall scores of those who read the enhanced texts) but yet did not process the italicized, bolded and enlarged agreement markers suggests that there is a need for TE studies to investigate how typographical cues are used in such research more closely (Simard, 2001). Existing TE studies have used different combinations of typographical cues in their research designs but researchers have not, to date, justified adequately why they chose one combination of cues over another. Questions related to the choice of typographical cues that stem from the findings of the present study are: Do different types of typographical modifications made to a text impact how learners process the input for meaning and form differently? Are certain typographical cues more effective in helping learners process the enhanced information for meaning? Are certain cues more effective for drawing learners' attention to the enhanced form?

How we enhance form in TE studies is another question that needs to be addressed. In TE studies that have enhanced verbs, most studies have enhanced entire verbs with the same typographical cue (e.g., Leow, 1997; Shook, 1994, 1999; Overstreet, 1998). Others, such as Leow (2001), underlined the entire verb but then bolded the verb ending. Could using a different typographical cue to enhance the verb ending have an impact on how that form is noticed? A dissertation by Overstreet is currently in progress to investigate this question.

Future research also needs to investigate the effect of TE over time using multiple exposures. TE treatment in the present study involved exposing learners to three texts that contained typographically enhanced input over a two week period. Would results be different if they had been given 30 texts to read over a longer period of time? Is it possible that learners' perception of enhanced information at the time of initial exposure to the enhanced input may be different than when that enhanced information is perceived over time? Could the enhanced items become less or even non-salient through repeated exposures over time, or could exposure over time have a more powerful effect on acquisition?

The potential effects of TE on discourse level processing versus sentence level processing also remains to be investigated. To date, L2 TE studies have examined discourse level processing only. Could TE have an impact if learners were required to process isolated sentences rather than connected discourse (see Wong, in progress)?

These questions and others remain to be investigated. Much more systematic research with more robust research designs is needed in order to further our understanding of how learners process input and if input enhancement can help learners make better form-meaning connections.

Conclusion

The findings of this study led to the following conclusions:

1. TE is not effective as a form of input enhancement on the acquisition of the French past participle agreement in relative clauses when acquisition is measured by an error correction task.
2. Input made more comprehensible through SI has a positive effect on comprehension.
3. However, input made more comprehensible through SI is insufficient to impact acquisition of the target form.
4. Drawing learners' attention to form via TE does not interfere with comprehension when whole clauses that contain the target form are underlined and when the form is a form of no communicative value. On the contrary, TE can result in better recall of enhanced information in the text.

The present study focused on the past participle agreement in relative clauses in French, a form of no communicative value, and provided insight on how TE and SI may affect how learners process input that contains this form for comprehension and acquisition. It is hoped that this study will stimulate more focused and robust research on the role of TE in SLA.

Appendix A

Error Correction Task (Version A)

Name: _____

Read each group of sentences below carefully. Some sentences are correct and some contain errors. Circle the letter of the sentences that are *INCORRECT* and *PROVIDE THE NECESSARY CORRECTIONS BY CROSSING OUT AND/OR ADDING LETTERS*. *DO NOT* change punctuation, accents or vocabulary.

SAMPLE ITEMS

1.

(A) Caroline, la fille que nous avons vu hier, est belle.

(B) Caroline est la petit soeur de mon meilleur ami, Tom.

(C) L'an dernier, Caroline a passé trois semaines en Espagne.

(D) Quand Caroline est allée en Espagne, elle a rencontré un homme.

(E) Caroline a travaillé avec l'homme qu'elle a rencontrée en Espagne.

(F) Cet homme espagnol s'appelle Pierre et il a très bizarre.

2.

(A) Pierre Tremblay adore les voitures et la cuisine française.

(B) Pierre n'aimait pas la voiture qu'il a eu l'an dernier.

(C) La semaine dernière, Pierre a acheté une bel voiture.

(D) Hier, Pierre a invité ses cousins chez lui pour une soirée.

(E) Pierre a mis une photo de son voiture dans la cuisine.

(F) La tarte au chocolat que Pierre a préparé pour la soirée était

magnifique.

Appendix B
Text 1: Unenhanced and Unsimplified Version

You have 10 minutes to read this text. After reading the text, you will be asked to recall the content of the passage.

Lise Thibault, lieutenante-gouverneure du Québec
"Comment j'ai réinventé ma vie" Par Mario Fortier

À la suite de la malchance qu'elle a eue, Lise Thibault a perdu l'usage de ses jambes, ce qui a transformé sa vie à jamais. Mais le malheur qu'elle a eu et la tristesse qu'elle a ressentie, ne l'ont pas empêchée de faire ce qu'elle veut. Ce n'est pas par hasard qu'elle est devenue lieutenante-gouverneure du Québec. La réussite qu'elle a eue est une affaire de coeur et d'attitude. Le difficile obstacle qu'elle a rencontré n'a pas changé son caractère.

Lise Thibault dit:<<J'étais âgée de 13 ans lorsque la trâine sauvage sur laquelle je glissais a été projetée à l'extérieur de la glissoire. Cette chute allait changer le cours de mon existence. La douleur que j'ai ressentie a été affreuse. La médecine de l'époque n'était pas ce qu'elle est aujourd'hui, et seules de longues immobilisations m'ont permis de recouvrer assez de force pour poursuivre mes études et, par la suite, pour ouvrir un studio de musique et de fleurs. Le succès que j'ai eu dans mes entreprises m'a fait du bien. Puis je me suis mariée avec un homme que j'ai rencontré dans mon studio et mon premier enfant est arrivé. Dix jours après la naissance de ma fille, Guylaine, des douleurs à la colonne vertébrale m'ont rappelé que j'en avais trop fait. Le médecin que j'ai vu m'a recommandé de ne plus avoir d'enfant. Mais je suis de nouveau tombée enceinte, et des complications m'ont retenue au lit. Dix-sept jours après la naissance d'Anne-Marie, deux embolies gazeuses ont provoqué l'irrémédiable. J'ai dû faire mon deuil de ce que j'avais perdu et composer avec mon nouveau corps. Mais je ne regrette rien. Je n'oublierai jamais le bonheur que j'ai ressenti à la naissance de mon enfant. Il suffit de rencontrer la fille que j'ai vue grandir, Anne-Marie, pour comprendre.>>

Mais, au début, ce n'était pas facile pour Lise Thibault de s'habituer à son nouveau corps. Elle raconte: <<Le mal que j'ai ressenti au debut était énorme. Le chagrin que j'ai vu dans les yeux de mon mari un jour m'a fait de la peine. Quand on est transformée physiquement du jour au lendemain, on n'a pas suffisament d'énergie pour entretenir de grandes espérances. Il faut prendre le temps de faire son deuil. Mais aujourd'hui, à mes yeux, un handicap est une porte ouverte sur autre chose, une occasion d'aller chercher des ressources nouvelles. L'auteure Marilyn Ferguson, une femme que j'ai rencontrée récemment, a dit: "La plus grande découverte de ce siècle est qu'on a réalisé qu'en changeant sa façon de penser on peut changer sa façon d'être."

Si j'occupe la fonction de lieutenante-gouverneure, ce n'est pas un hasard: chaque expérience dans ma vie m'a permis d'être la Lise Thibault que je suis. Une amie que j'ai vue recemment m'a dit qu'il ne faut pas attendre d'être parfait pour agir en servant de modèle aux autres. L'hiver dernier, j'ai

commencé à faire du bi-ski, une espèce de luge sur ski, et plusieurs personnes m'ont dit que cela les avait stimulées. Une jeune femme que j'ai rencontrée m'a dit que je l'avais inspirée.>>

Appendix C

Text 1: Enhanced and Simplified Version

You have 10 minutes to read this text. After reading the text, you will be asked to recall the content of the passage.

Lise Thibault, lieutenante-gouverneure du Québec
"Comment j'ai réinventé ma vie" Par Mario Fortier

Après la *malchance qu'elle a eu*e, Lise Thibault a perdu l'usage de ses jambes. Cet accident a transformé sa vie. Mais le *malheur qu'elle a* eu et la *tristesse qu'elle a ressenti*e*, ne l'ont pas empêchée de faire* ce qu'elle veut. Ce n'est pas par hasard* qu'elle est devenue lieutenante-gouverneure du Québec. La *réussite qu'elle a eu*e vient de son coeur et de son attitude positive. Le *difficile obstacle qu'elle a rencontr*é n'a pas changé son caractère.

Lise Thibault dit: <<J'étais âgée de 13 ans quand j'ai eu mon accident. J'étais sur un toboggan qui est tombé à l'extérieur de la glissoire*. Cet accident a changé ma vie. La *douleur* que j'ai ressenti*e* après cet accident a été terrible. Quand j'étais jeune, la médecine n'était pas bonne. Je suis restée au lit pendant longtemps. Finalement, j'ai eu assez de force pour continuer mes études. Plus tard, j'ai ouvert un studio de musique et de fleurs. Le *succès que j'ai e*u dans mes entreprises m'a fait du bien. Plus tard, je me suis mariée avec un *homme que j'ai rencontr*é dans mon studio. Puis, j'ai eu mon premier enfant, ma fille Guylaine. Dix jours après la naissance* de Guylaine, j'ai eu des douleurs* à la colonne vertébrale. Le *médecin que j'ai v*u m'a recommandé de ne plus avoir d'enfant. Mais je suis tombée enceinte* une deuxième fois avec des complications. Dix-sept jours après la naissance* de ma deuxième fille, Anne-Marie, j'ai perdu l'usage de mes jambes. J'ai dû accepter mon handicap et mon nouveau corps. Mais je ne regrette rien. Je n'oublierai jamais le *bonheur que j'ai ressen*t * à la naissance de mon enfant. Si tu rencontres la *fille que j'ai vu*e grandir, Anne-Marie, tu vas comprendre.>>

Mais au début, c'était difficile pour Lise Thibault d'accepter son handicap. Elle dit: <<Le *mal que j'ai ressen*t* au debut était énorme. Le *chagrin que j'ai v*u dans les yeux de mon mari un jour m'a fait de la peine. Il est difficile d'être transformée physiquement soudainement. On n'a pas assez d'énergie pour avoir de l'espoir. Il faut prendre le temps d'accepter son handicap. Mais aujourd'hui, pour moi, un handicap n'est pas une mauvaise chose. C'est une occasion d'aller chercher des ressources nouvelles. L'auteure Marilyn Ferguson, une *femme que j'ai rencontré*e récemment, a dit: "Voici la plus grande découverte de ce siècle: Quand on change sa façon de penser, on change sa façon d'être."

Aujourd'hui, je suis lieutenante-gouverneure du Québec. Ce n'est

pas un hasard* si j'ai cette carrière. Je suis la Lise Thibault que je suis grâce à toutes les expériences dans ma vie. Une *amie que j'ai vu*e recemment m'a dit: " On peut toujours être un modèle pour les autres personnes. On n'a pas besoin d'être parfait."

L'hiver dernier, j'ai commencé à faire du bi-ski. Le bi-ski est une sorte de chaise sur ski. Ma décision de faire ce sport a encouragé beaucoup de personnes. Par exemple, une *jeune femme que j'ai rencontré*e m'a dit que je l'avais inspirée.

Vocabulary
* *la douleur*: pain * *empêcher de faire*: to prevent from doing * *la glissoire*: slide * *grandir*: to grow up * *le hasard*: chance/luck * *la naissance*: birth * *ressentir*: to feel * *tomber enceinte*: to become pregnant

APPENDIX D

Free Recall Task

Name _____

Recall *IN ENGLISH* as many ideas as you can from the text you just read. Write everything you can recall in the space below. Use as much detail as possible. You have 10 minutes for this exercise.
PLEASE DO NOT *LOOK BACK AT THE TEXT.*

Appendix E

Sample Idea Units for Unsimplified Versions

Lise Thibault, lieutenante-gouverneure du Québec

1. À la suite de *la malchance qu'elle a eue,* *
2. Lise Thibault a perdu l'usage de ses jambes
3. ce qui a transformé sa vie à jamais.
4. Mais *le malheur qu'elle a eu*
5. et *la tristesse qu'elle a ressentie,*
6. ne l'ont pas empêchée
7. de faire ce qu'elle veut.
8. Ce n'est pas par hasard
9. qu'elle est devenue lieutenante-gouverneure du Québec.
10. *La réussite qu'elle a eue*
11. est une affaire de coeur
12. et d'attitude.

Alexandre Tagliani: Coureur automobile en formule CART

1. C'est bien malgré lui que ce jeune homme de 25 ans
2. est aujourd'hui un coureur automobile des plus prometteurs.
3. Dans cet article, il nous raconte
4. comment il a eu la piqûre pour ce sport,
5. en plus de nous parler de l'une de ses plus grandes craintes,
6. *une peur qu'il a eue* en 1996.
7. D'abord, Tagliani dit que les pilotes modernes sont différents
8. de leurs prédécesseurs.
9. <<*Un pilote que j'ai rencontré* hier d'accord avec moi.
10. Les coureurs d'aujourd'hui pensent
11. davantage à la stratégie.

Tout le Quebec pleure sa petite Marie

1. Il était environ 22h00
2. dimanche soir
3. quand les stations de radio...ont annoncé une éffrayante nouvelle.
4. et de télévision partout au Québec
5. En manchette, on disait <<Le cinéaste Jean-Claude Lauzon
6. et la comédienne Marie-Soleil Tougas
7. (Ils) sont morts.
8. Leur avion s'est écrasé
9. dans le Grand Nord.>>
10. La nouvelle a fait le tour de la province
11. à une vitesse phénominale.
12. *La peine que le Québec a ressentie...*était forte.
13. en apprenant cette nouvelle

* Bolded phrases are enhanced idea units

Appendix F

Sample Idea Units for Simplified Versions

Lise Thibault, lieutenante-gouverneure du Québec

1. Après *la malchance qu'elle a eue,*
2. Lise Thibault a perdu l'usage de ses jambes.
3. Cet accident a transformé sa vie.
4. Mais *le malheur qu'elle a eu*
5. et *la tristesse qu'elle a ressentie,*
6. ne l'ont pas empêchée
7. de faire ce qu'elle veut.
8. Ce n'est pas par hasard
9. qu'elle est devenue lieutenante-gouverneure du Québec.
10. *La réussite qu'elle a eue*
11. vient de son coeur

12. et de son attitude positive.

Alexandre Tagliani: Coureur automobile en formule CART

1. Alexandre Tagliani, ...est un très bon coureur automobile
2. un jeune homme de 25 ans,
3. Dans cet article, Tagliani parle de deux choses:
4. 1) comment il a developpé sa passion pour la course,
5. et 2) une mauvaise expérience,
6. *une peur qu'il a eue* en 1996.
7. D'abord, Tagliani dit que les coureurs automobiles modernes ne sont pas
8. comme les coureurs automobiles du passé.
9. <<*Un coureur automobile que j'ai rencontré* hier est d'accord avec moi.
10. Les coureurs automobiles d'aujourd'hui pensent
11. beaucoup plus à la stratégie.

Tout le Quebec pleure sa petite Marie

1. Dimanche soir
2. à 10 heures,
3. les stations de radio...ont annoncé une terrible nouvelle:
4. et de télévision du Québec
5. <<Le cinéaste Jean-Claude Lauzon
6. et la jeune actrice Marie-Soleil Tougas
7. (Ils) sont morts
8. dan un accident d'avion
9. dans le Grand Nord.>>
10. Le public a appris cette mauvaise nouvelle
11. très rapidement.
12. *La peine que le Québec a ressentie* ...était forte.
13. quand il a appris cette nouvelle

References

Alanen, R. (1995). Input enhancement and rule presentation in second language acquisition. In R. Schmidt (Ed.), *Attention and awareness in foreign language acquisition* (pp. 259-302). Honolulu: University of Hawaii.

Bachman, L. F., & Palmer, A. S. (1997). *Language testing in practice* (2nd ed.). Oxford: Oxford University Press.

Blau, E. K. (1982). The effect of syntax on readibility for ESL students in Puerto Rico. *TESOL Quarterly, 16,* 517-528.

Bransdorfer, R. (1991). *Communicative value and linguistic knowledge in second language oral input processing*. Unpublished doctoral thesis, University of Illinois at Urbana-Champaign.

Brown, R. (1987). A comparison of the comprehensibility of modified and unmodified reading materials for ESL. *University of Hawaii Working Papers in ESL, 6,* 49-79.

Carrell, P. (1985). Facilitating ESL reading by teaching text structure. *TESOL Quarterly, 19,* 727-752.

Overstreet, M. (in progress). The effect of textual enhancement on second language learner comprehension and form recognition. Unpublished doctoral dissertation, The University of Illinois at Urbana-Champaign.

Parker, K., & Chaudron, C. (1987). The effects of linguistic simplifications and elaborative modifications on L2 comprehension. *University of Hawaii Working Papers in ESL, 6,* 107-133.

Robinson, P. (1995a). Aptitude, awareness, and the fundamental similarity of implicit and explicit second language learning. In R. Schmidt (Ed.), *Attention and awareness in foreign language learning* (pp.303-357). Hawaii, HI: University of Hawaii Press.

Robinson, P. (1995b). Review article: Attention, memory, and the " Noticing " hypothesis. *Language Learning, 45,* 283-331.

Robinson, P. (1996). Learning simple and complex second language rules under implicit, incidental, rule-search, and instructed conditions. *Studies in Second Language Acquisition, 18,* 27-67.

Rosa, E. & O'Neill, M. (1999). Explicitness, intake and the issue of awareness: Another piece to the puzzle. *Studies in Second Language Acquisition, 21,* 511-556.

Schmidt, R. (1990). The role of consciousness in L2 learning. *Applied Linguistics, 11,* 129-158.

Schmidt, R. (1993). Awareness and second language acquisition. *Annual Review of Applied Linguistics, 13,* 205-225.

Schmidt, R. (1994). Deconstructing consciousness in search of useful definitions for applied linguistics. *AILA Review, 11,* 11-26.

Schmidt, R. (Ed.) (1995). *Attention and awareness in foreign language learning.* Honolulu: University of Hawaii.

Schmidt, R. (2001). *Attention.* In P. Robinson (Ed.), *Cognition and second language instructiontion* (pp. 3-32). Cambridge: Cambridge University Press.

Schmidt, R. & Frota, S. (1986). Developing basic conversational ability in a second language: A case study of an adult learner of Portuguese. In R. Day (Ed.), *Talking to learn: Conversation in second language acquisition.* Rowley, MA: Newbury House.

Schnell, T. R., & Rocchio, D. J. (1974). A study of the relative effectiveness of various underlining strategies on reading comprehension. [speech conference paper/ NO ERICL ED099821]

Schnell, T. R., & Rocchio, D. J. (1978). A comparison of underlining strategies for improving reading comprehension and retention. *Reading Horizons, 18,* 106-109.

Sharwood Smith, M. (1981). Consciousness-raising and the second language learner. *Applied Linguistics, 2,* 159-168.

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, J. D. (1994). FL/L2 reading, grammatical information, and the input to intake phenomenon. *Applied Language Learning, 5,* 57-93.

Shook, J. D. (1999). What foreign language reading recalls reveal about the input-to-intake phenomenon. *Applied Language Learning, 10,* 39-76.

Simard, D. (2001). *Effet de la mise en évidence textuelle sur l'acquisition de différente marques du pluriel en anglais langue seconde auprès de jeunes francophones de première secondaire*. Doctoral dissertation, Université Laval, Québec.

Simard, D. & Wong, W. (1999). *La mise en évidence dans la classe de langue seconde*. Workshop presented at the Canadian Association for Applied linguistics, Sherbrooke, Canada.

Tomlin, R. & Villa, H. (1994). Attention in cognitive science and second language acquisition. *Studies in Second Language Acquisition, 16,* 183-203.

VanPatten, B. (1990). Attending to form and the content in the input: An experiment in consciousness. *Studies in Second Language Acquisition, 12,* 287-301.

VanPatten, B. (1994). Evaluating the role of consciousness in the second language acquisition: Terms, linguistic features and research methodology. *AILA Review, 11,* 27-36.

VanPatten, B. (1996). *Input processing and grammar instruction: Theory and research*. Norwood, NJ: Ablex.

VanPatten, B. (2000). Processing instruction as form-meaning connections: Issues in theory and research. In J. Lee and A. Valdman (Eds.), *Form and meaning: Multiple perspectives* (pp. 43-68). AAUSC Issues in Language Program Direction, Boston: Heinle & Heinle.

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.

Wong, W. (2001). Modality and attention to meaning and form in the input. *Studies in Second Language Acquisition*, 23, 345-368.

Wong, W. (in progress). Sentence-level vs discourse-level processing: A study with textual enhancement.

Wong, W., & Simard, D. (1999). *Textual enhancement as input enhancement: A state of the art review*. Unpublished manuscript. The Ohio State University.

Yano, Y., Long, M. & Ross, S. (1994). The effects of simplified and elaborated texts on foreign language reading comprehension. *Language Learning, 44*, 189-219.

Notes

1. As discussed in Simard (2001), it is preferable to construct assessment tasks that are similar to treatment tasks whenever possible. Bachman and Palmer (1997) refers to this as a criterion of test validity, that is to say, that of authenticity in a testing situation:

   ..we would describe a test task whose characteristics correspond to those of TLU (target language use) tasks as relatively authentic. We define authenticity as the degree of correspondence of the characteristics of a given language test task to the features of a TLU task. (Bachman & Palmer, 1997, p. 23)

2. The textbooks used at the two institution were different but both were very similar in approach. A typical lesson in both texts began with the presentation of vocabulary, followed by explanation of a grammar point, followed by practice exercises that moved from mechanical to meaningful to communicative practice.
3. One reviewer pointed out that enhancing the article and underlining the entire clause may have confounded the purpose of the experiment, that is to say, to measure the potential effect of TE on a non-meaningful form. This point is well-taken and is acknowledged as a limitation of the study. The decision to enhance the article and to underline the clause was motivated by the desire to establish a clear relationship between the gender of the direct object and the necessary agreement marker in the past participle. However, as another reviewer commented, the fact that this type of enhancement caused subjects to process the entire clause for meaning is an interesting finding. This points to the need for researchers to pay closer attention to the type of enhancement they use.
4. One reviewer pointed out that a questionnaire is too general to measure noticing. An alternative way of assessing whether participants noticed the enhancement or not would be to use think-aloud protocols like the ones used by Alanen (1995) and Leow (2001). Due to time and facility constraints, this measurement was not possible in the present study.
5. Given that all the recall data were scored by the researcher, there was no interrater reliability data collected.

Author

Textual Enhancement and Simplified Input: Effects on L2 Comprehension and Acquisition of Non-meaningful Grammatical Form

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Distinctiveness and Bidirectional Effects in Input Enhancement for Vocabulary Learning

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This study examined input enhancement and second language (L2) vocabulary learning while exploring the role of distinctiveness*, the degree to which an item in the input diverges from the form in which other items in the input are presented, with regard to the nature and direction of the effects of enhancement. In the study, English-speaking first-semester L2 Spanish learners studied lists of 24 new Spanish words along with their first language (L1) translations in English. In Experiment 1, one list of the words had 9 of 24 words enhanced, and the other list was unenhanced. In Experiment 2, one list of the words had 3 of 24 words enhanced, and the other list was unenhanced. Four posttests were administered to provide immediate and delayed measures of L1-to-L2 and L2-to-L1 recall. Only the results of Experiment 2 revealed significant effects for enhancement, suggesting that distinctiveness may moderate the effect of enhancement to some extent. The results of Experiment 2 for the enhanced group also indicated better performance on a proportional measure (target words learned ÷ all words learned) for enhanced items and lower performance for unenhanced items. These findings support the need to examine distinctiveness and bidirectional effects in future research on input enhancement.*

In the past decade, a number of studies have been conducted on the effects of input enhancement on the acquisition of targeted forms in second language (L2). *Input enhancement* refers to the manipulation of input in a way that renders some items more perceptually salient than others. Studies on input enhancement have been conducted in the aural and written modes and have examined effects of enhancement on both grammatical structures and vocabulary items. Findings have been mixed but, on the whole, point towards the potential of using enhancement as a technique to draw learners' attention towards targeted forms and thereby increase the rate at which L2 learners acquire those forms. In research on grammar-oriented textual enhancement, for example, Shook (1994) found that enhancing examples of the Spanish present perfect and relative pronouns resulted in more production and better recognition of those forms. Jourdenais, Ota, Stauffer, Boyson, and Doughty (1995)

also found that textual enhancement of the Spanish preterit and imperfect tenses could increase learners' subsequent production of those grammatical forms (see Wong, 2000, for a review of input enhancement studies on grammatical items).

Types of Input Enhancement

There are important qualitative differences between enhancement techniques that have been examined in various textual enhancement studies. For example, in Jourdenais, et al.'s study, the enhancement condition consisted of *typographical manipulation* only. The text in their study was not altered in any other way, and their participants were not asked to perform any other type of tasks beyond the reading task. However, techniques that go beyond typographical manipulation have also been included under the rubric of input enhancement. One such technique is *input flood*, or the inclusion of many more examples of a targeted item in an input set than would otherwise be the case. Even *explicit instruction*, which requires learners to perform additional tasks beyond reading the text, has been included under the rubric of input enhancement (Sharwood Smith, 1991, 1994). In grammar-oriented enhancement research, some studies have indicated that enhancement may increase learning rates by drawing learners' attention to targeted grammatical forms (Jourdenais et al., 1995; Shook, 1994; Simard, 2001). Other studies, however, have not found this type of benefit for enhancement (e.g., Leow, 1997, 2001; Overstreet, 1998). For example, Leow (2001) found that typographically enhancing Spanish imperative verb forms in a reading passage did not significantly improve learners' performance on a measure of intake of that form, on a measure of comprehension of the passage, or on a measure of the amount that learners mentioned, circled, or made reference to the typographically enhanced verbs in the passage in a think-aloud protocol.

With regard to vocabulary learning, target words in texts can also be enhanced in a variety of ways. Words can be enhanced via typographical manipulation, in which case the enhanced target words also may be translated or defined. When words are not translated or defined, the learner must rely on context to get the meaning of a new target word. In order to make use of translations or definitions of enhanced words, however, the learner must perform tasks that go beyond only reading the text and paying special attention to the typographically enhanced words in the text. Learners also can be asked to perform other types of activities related to typographically enhanced target words. They can be asked, for example, to look at a picture of the word referent, to select among several definitions for the words based upon the context of the word in the text, or to perform some other type of vocabulary learning activity related to the word. In related L2 vocabulary learning research, Hulstijn, Hollander, and Greidanus (1996) found that the use of marginal glosses for enhanced target words can have a positive effect on incidental vocabulary learning rates during reading. Positive effects were also observed by Chun and Plass (1996) for the use of pictures as annotations and by Watanabe (1997)

for the use of single or multiple-choice marginal glosses.

The appropriateness of including marginal glossing and activities such as selecting among multiple marginal glosses under the label of "input enhancement" may be debatable given how (a) the glosses involve altering the original text and (b) the tasks require learners to perform additional activities that go beyond reading. However, the appropriateness of including input flood and explicit instruction under the label of "input enhancement" is debatable for the same two reasons. Therefore, it is important to note that for both grammar- and vocabulary-directed forms of input enhancement, input enhancement can vary along two key dimensions: (a) the extent to which it alters the original input set (e.g., text, oral passage), and (b) the extent to which it requires learners to perform activities beyond attempting to comprehend the input only. More invasive varieties of input enhancement tend to involve altering the original input to a substantial degree (e.g., input flood, marginal glosses) and tend to require learners to perform tasks that go beyond input comprehension only (e.g., explicit instruction, a multiple-choice activity), whereas less invasive varieties do not alter the original input to such a degree and do not require learners to perform tasks that go beyond processing the input only (e.g., typographical manipulation).

With regard to language instruction, the relative effectiveness of elaborate forms of input enhancement need to be evaluated in consideration of the overall time invested and what learners have gained. For example, a claim that some form of explicit instruction has resulted in more acquisition of a particular form should reflect the overall amount of time that learners spent on learning the explicit rules as well as processing input versus the overall amount of time that learners would spend in the alternative (e.g., "input only") condition. In other words, when making pedagogical claims, the general principle that *effectiveness = amount learned ÷ amount of time spent on learning* should be considered.

In both experiments of the present study, the type of textual enhancement examined was typographical manipulation via increasing font size and bolding, and the amount of time allotted to the participants in both the enhanced and unenhanced conditions of the study was held constant. Therefore, as in previous studies on enhancement, the effectiveness of this less invasive variety of enhancement was examined. Two other elements were also included in the present study, however. First, the study examined the effect of enhancement in the realm of *discrete-item vocabulary learning*, or when learners are exposed to new words that appear in a list. Second, the study considered *distinctiveness*, or the degree to which an item in the input diverges from the form in which other items in the input are presented, as a potential key factor in input enhancement research. The next two sections discuss the motivation for including these two elements in the present study.

Enhancement and Discrete-Item Vocabulary Learning

Input enhancement for discrete-item vocabulary learning is qualitatively different from discourse-level input enhancement research in which learners attempt to comprehend a written text (textual enhancement) or an oral passage. With discrete-item vocabulary learning, a learner is presented with a series of new target words and a means for associating the target words with their referents, such as via series of L1 translation equivalents or a series of pictures of the referents. Unlike discourse-level learning, the learner's task does not involve comprehending sentences and putting sentences together in order to comprehend a passage. Nevertheless, there are a number of reasons why it is beneficial to conduct research on enhancement in discrete-item learning paradigms as well as in discourse-level paradigms.

To begin, enhancement studies on discrete-item vocabulary learning lend themselves to experimental controls that discourse-level grammar-oriented enhancement studies do not. In discrete-item vocabulary studies, learners can be pretested on the target (lexical) forms in a direct manner by asking them to provide translations of the target words, whereas in a grammar-oriented discourse-level enhancement study it may be difficult to ascertain (at least as readily) the learners' preexisting degree of knowledge of a target grammatical form. Experiments on discrete items also facilitate manipulating an entire input set with regard to which items are enhanced and unenhanced in a systematic and structured manner. Benefiting from these methodological advantages, research on enhancement for discrete items can also be used to assist in generating new hypotheses that can also be tested in subsequent discourse-level grammar- and vocabulary-oriented enhancement research. Finally, other benefits of research on discrete-item vocabulary learning may be more direct and applied in nature, given that people sometimes learn new vocabulary words as series of discrete items by associating single words with a series of translations, by associating them a series of pictures of word referents, or by associating them with a series of real-world examples of the word referents. Understanding how enhancement affects learning rates during serial learning of this nature may help to shed new light on the relationship between attention, processing resource allocation, and vocabulary learning.

With regard to the discrete-item nature of present study, three points should be clarified. (1) First, it is important not to conflate discourse-level textual enhancement research with discrete-item enhancement research. (2) Nevertheless, by paying careful attention to the differences between discourse-level and discrete-item forms of enhancement, one may reflect upon findings regarding enhancement and discrete-item learning when analyzing previous research on discourse-level enhancement research and when working to generate hypotheses that can be tested in future enhancement research. (3) Finally, conducting research on enhancement and discrete-item vocabulary learning can be informative independent of discourse-level issues given that learners sometimes learn vocabulary as a series of discrete items.

Degree of Distinctiveness

One issue warranting further exploration in enhancement research is the role of different degrees of distinctiveness. Degree of distinctiveness refers to the extent to which the manner of presentation of an item diverges from the manner of presentation of other items in an input set. When the manner of presentation of an item is more distinct (enhanced), it may become more salient ("stick out" more, "blend in" less), which could make a learner may pay more attention to it and learn it more readily. This line of reasoning is consistent with the findings of many cognitive studies on the effects of distinctiveness on memory (see Eysenck, 1979). For example, Going and Read (1974) found that subjects remember faces rated as high in uniqueness much better than they remember faces rated low in uniqueness (by 71.7 to 53.1 percent). In a typical input enhancement study, performance in a condition in which a target item has been made more distinct (enhanced) is compared to performance in a condition in which the target item has not been made more distinct (unenhanced). What can be explored further is how presenting target items in different degrees of distinctiveness affects performance.

The degree of distinctiveness of an item in an input set can be altered in a number of ways. In the spoken mode, (a) different amounts of acoustic stress can be placed on one item in an input set; (b) delays of different lengths can be inserted before the item, after the item, or both in the speech stream; or (c) different numbers of target items within the same spoken input set can be acoustically enhanced. In the written mode, (a) different degrees of font size can be incorporated; (b) different amounts of other types of typographical manipulation (e.g., bolding, shadowing) can be used; (c) an increased or decreased number of target items within the same written input set can be textually enhanced. These examples and other ways of manipulating the degree of distinctiveness of both grammatical and lexical target items warrant exploration.

The meaning of "more distinct" may also differ between discourse-level versus discrete-item enhancement and between grammar-oriented versus vocabulary-oriented enhancement. For example, a typical goal of grammar-oriented discourse-level enhancement is to draw learners' attention to a pattern in the input (as opposed to drawing attention to a set of individual words). Therefore, repeated examples of the enhanced grammatical item may be necessary in order to draw learners' attention to the pattern. In this case, to increase the distinctiveness of the enhanced grammatical item, one may need to select a means of increasing distinctiveness that does not involve altering the number of times the target form is enhanced, such as enhancement via the use of a more distinct variety of typographical manipulation.

Consistent with this idea are the results of a study by Simard (2001), who compared the effects of different ways of typographically enhancing English plural markers in a text—underlining; bolding; uppercase; color; a combination of underlining, bolding, uppercase, color, and italics (5 cues); a combination of bolding, uppercase, and underlining (3 cues); and a

no-enhancement control—on immediate and delayed (1 month later) measures of performance on a multiple-choice recognition task. Results of the immediate posttest indicated a positive overall effect for the enhancement group over the control group and highest performance for the uppercase group. However, results of a delayed posttest indicated no difference between enhancement versus control and highest performance in the italics group. On the immediate posttest, the use of 3 cues resulted in better performance than the use of 5 cues or 1 cue, but this advantage was not maintained on the delayed test. Overall, these results suggest that enhancement can have a positive effect on learners' immediate recognition of target forms and that *how* target forms are enhanced may moderate the effect of enhancement on target form recognition.

Motivation for the Present Study

One purpose of present study was to examine the effects of two different degrees of distinctiveness as techniques of input enhancement on discrete-item L2 vocabulary learning. In two experiments, participants were asked to do their best to learn a set of 24 new L2 words when given a list of the target words and their L1 translations. In Experiment 1, one group received a list with 9 out of the 24 target words enhanced, and the other group received an unenhanced version of the list. In Experiment 2, one group received a list with only 3 out of the 24 words enhanced, and the other group received an unenhanced version of the list. The 3:24 ratio used for enhancement in Experiment 2 was deemed to be a *more distinct* form of textual enhancement than the 9:24 ratio used in Experiment 1 because the manner of presentation of the enhanced words in the list with the 3:24 ratio diverged to a greater degree from the manner of presentation of all of the items in the input set as compared to the list with the 9:24 ratio. In this way, the present study explored whether degrees of distinctiveness might affect discrete-item vocabulary learning rates. The rationale for selecting 9 out of 24 words as the less distinct form of enhancement and for selecting 3 out of 24 words as the more distinct form of enhancement was based on the following ideas: (1) Enhancing 9 out of 12 items approaches but does not surpass the half-way point (12) with respect to the total number of words on the list (24), therefore, the 9 words on the page remain somewhat but not highly distinct with respect to the entire input set. (2) Enhancing 3 out of 24 items remains far below the half-way point with respect to the total number of words on the list, therefore, the 3 words remain highly distinct with respect to the entire input set.

Another purpose of the present study was to examine the relationship between learning rates for target items and nontarget items with regard to how learners must allocate their limited (cognitive) processing resources. When a learner is presented with any set of stimuli, the issue of what constitutes a "target" versus "nontarget" item is critical. When learners process linguistic input (samples of language), they benefit because their developing system can extract linguistic information (e.g., new lexical items, new syntactic structures) from it. However, the linguistic information that can be extracted from any type

of input set (e.g., a list of discrete vocabulary items, a written text, a spoken passage, a conversation) can not be reduced to one type of target item only. Even a single phrase can include a myriad of different types of information (evidence, clues) about the structure of a language. Therefore, in terms of a learner's overall linguistic development, the notion of isolating specific grammatical structures or words as target items needs to be approached carefully. With regard to input enhancement, if one "target" item or a set of target items is to be enhanced, the way in which it is enhanced might affect acquisition rates for other "nontarget" items as well. If a learner's processing resources become directed more towards one particular target item, resources that would otherwise be directed towards other items may become depleted and thereby decrease acquisition rates for those other items. Therefore, it is important to consider how enhancement affects *overall processing resource allocation*, or how a learner's limited processing resources are allocated among *all* of the items presented in a given input set, which includes both enhanced target items and unenhanced nontarget items.

Whereas previous studies on input enhancement have focused on the acquisition of enhanced target items, the present study focused on the effects of enhancement on both enhanced target items and unenhanced nontarget items. More specifically, the study measured the effects of enhancement on the learning rates for both enhanced words and unenhanced words that appeared within the same list of translated pairs. In this way, the effects of enhancement on learning enhanced as well as unenhanced words within one list could be explored. The discrete-item nature of the present study limits its generalizability with regard to discourse-level textual enhancement. However, if enhancing a set of target words in a vocabulary list has a significant effect on learning rates for the unenhanced nontarget words, this finding could also be used to help generate testable hypotheses about the relationship between enhancement and attention to enhanced target items versus unenhanced nontarget items in discourse-level enhancement research as well.

Research Questions

The present study was guided by four sets of research questions:

1. Does enhancing 9 out of 24 words in a vocabulary list affect learning rates for the 9 enhanced words? If so, is the effect positive or negative? (Experiment 1)
2. Does enhancing 9 out of 24 words in a vocabulary list affect learning rates for the other 15 words in the list? If so, is the effect positive or negative? (Experiment 1)
3. Does enhancing 3 out of 24 words in a vocabulary list affect learning rates for the 3 enhanced words? If so, is the effect positive or negative? (Experiment 2)
4. Does enhancing 3 out of 24 words in a vocabulary list affect learning rates for the other 21 words in the list? If so, is the effect positive or negative? (Experiment 2)

The first two research questions were addressed in Experiment 1. The third and fourth research questions were addressed in Experiment 2. Because 9 of 24 words were enhanced in Experiment 1 whereas only 3 of 24 were enhanced in Experiment 2, the type of enhancement used in Experiment 2 was more distinct in nature than the type of enhancement used in Experiment 1. In this manner, the potential role of distinctiveness could be explored in the study.

With regard to Questions 1 and 3, it was possible that *positive* effects might be obtained both for enhancing 9 out of 24 items and for enhancing 3 out of 24 items when the dependent measure reflected the number of *enhanced* words learned. Previous studies have observed positive effects for textually enhancing target grammatical items (Shook, 1994; Jourdenais et al., 1995) and for textually enhancing target vocabulary words and concurrently identifying word meaning in different ways (Hulstijn, Hollander, & Greidanus, 1996; Chun & Plass, 1996; Watanabe, 1997). It is important to remember the inherent differences between these discourse-level studies and the discrete-item nature of the present study. From a theoretical perspective, however, enhancing 9 of 24 words and 3 out of 24 words could both have a positive effect on learning rates for the enhanced new words by increasing the salience of enhanced words and thereby drawing more processing resources towards those words. However, given that enhancing only 3 out of 24 words was a more distinct form of enhancement than enhancing 9 out of 24 words, it could be more likely to obtain positive effects for enhancing only 3 out of 24 words as opposed to 9 out of 24 words.

With regard to Questions 2 and 4, it was possible that *negative* effects might be obtained both for enhancing 9 out of 24 items and for enhancing 3 out of 24 items when the dependent measure reflected the number of *unenhanced* words learned due to the expected relationship between enhancing specific words in an input set and overall processing resource allocation. If task demands are high enough, as in the case of attempting to learn a set of new words in a restricted amount of time (e.g., 24 new words in 9.6 minutes), drawing learners' attention and processing resources towards some words should also decrease their ability to attend to and process other words. In this case, the rate at which they are able to learn the other words should decrease. Therefore, in cases where positive effects were observed for enhanced words, concurrent negative effects might also be observed for unenhanced words learned. Additionally, if positive effects on enhanced words are revealed when only 3 out of 24 words are enhanced but not when 9 out of 24 words are enhanced (due to the role of distinctiveness), the potentially negative effect of enhancement on the number of unenhanced items learned might also be revealed only when 3 out of 24 words are enhanced but not when 9 out of 24 words are enhanced.

Experiment 1

Research Questions

As stated previously, Experiment 1 addressed the first two sets of research questions in the study:

1. Does enhancing 9 out of 24 words in a vocabulary list affect learning rates for the 9 enhanced words? If so, is the effect positive or negative?
2. Does enhancing 9 out of 24 words in a vocabulary list affect learning rates for the other 15 words in the list? If so, is the effect positive or negative?

Participants

Participants in Experiment 1 were 15 English-speaking first-semester learners of Spanish. Nine were females; six were males. All of the participants were from the same Spanish class. The participants met the following criteria: (a) their L1 was English, and (b) Spanish was not spoken regularly in their household.

Experimental Words

The 24 experimental words were selected according to the following criteria: (a) they were concrete nouns that could be represented visually; (b) there was a strong likelihood that the participants would not know the words; (c) they were not easily recognizable cognates with English. A selection of two-, three-, four-, and five-syllable words was included. The experimental words used were the following: *gancho* 'hook,' *pala* 'shovel,' *pinza* 'clothespin,' *clavo* 'nail,' *lupa* 'magnifying glass,' *imán* 'magnet,' *borla* 'tassel,' *asa* 'handle,' *balde* 'bucket,' *candado* 'lock,' *aletas* 'flippers,' *tenazas* 'pliers,' *rastrillo* 'rake,' *embudo* 'funnel,' *chiringa* 'kite,' *taladro* 'drill,' *serrote* 'saw,' *clavija* 'plug,' *cabestrillo* 'sling,' *regadera* 'sprinkler,' *sacudidor* 'feather duster,' *estantería* 'shelf,' *destornillador* 'screwdriver,' *resbaladilla* 'slide.'

Procedure

All data were collected in the participants' regular classrooms during regular class hours. Each participant completed a language background questionnaire and a pretest on which the 24 experimental words appeared in Spanish. On the pretest, the participants were asked to write the English word for any of the 24 Spanish words they knew and to turn in the sheet when they had finished. None of the participants correctly translated any of the words on the pretest.

All of the participants were then given a learning packet. On the first page they were provided with written instructions asking them to study and do their best to learn the new words on their list (Appendix A). The written instructions informed the participants that they would be asked to write Spanish words when presented with English words and to write English words when

presented with Spanish words later on. The instructions also clarified that the students should study words on their own sheet only and that they should not to speak with other students. The participants were not explicitly instructed to pay more attention to the enhanced items in the list, however. After the participants had read the instructions, they were asked to turn the page and to begin the study phase. Eight of the participants received an unenhanced version of the list, and 7 received a version on which 9 of the 24 words were enhanced (Appendix B). The enhanced words were bolded and appeared in 16- as opposed to 12-point font. Only Spanish words (the target items) were bolded. All of the participants were given 9.6 minutes to study the words on the list. This amount of time corresponded to 24 seconds per word on the list. This amount was selected in an effort to avoid ceiling and bottom effects in light of the results of Barcroft (2000) showing a mean of approximately 40% (4.83 out of 12 possible words) in a repetition condition when learners were allotted 24 seconds per word using the same target words as those in the present study.

Immediately after the study phase, the participants were given Posttest 1, which was a measure of L1-to-L2 (L1>L1) recall. Posttest 1 required the participants to write each Spanish word or as much of each Spanish word as they could when presented with English words. The participants were then given Posttest 2, a measure of L2-to-L1 (L2>L1) recall. Posttest 2 required the participants to write English words when presented with Spanish words only. On each posttest, the ordering of the words was randomized. Two days later the participants took Posttests 3 and 4, which were delayed versions of Posttests 1 and 2 with the same words presented again in a different randomized order. The participants were to be allotted 2.4 minutes to complete each posttest, which corresponded to 6 seconds per word. This amount was half the amount that had been allotted per word on the posttests in Barcroft's (2000) study. The amount was selected considering the likelihood that the participants would respond more quickly to some of the words on the list-oriented posttests in the present study as compared to the one-by-one format with 12 seconds per word used in the posttests in Barcroft's (2000) study. Due to a timing difficulty, only approximately 2.4 minutes (within 16 seconds) were allotted on each posttest, but both the enhanced and unenhanced groups in the class were allotted the same amount of time on each posttest. Additionally, many participants finished the posttests well before the allotted time had expired.

On the back of Posttest 4, the researcher asked the students to respond "yes" or "no" to a question about whether or not they had seen or practiced any of the 24 Spanish words since the first day of the experiment. None of the participants indicated that they had done so. Therefore, no participant was excluded due to having had additional practice with the experimental words between the first immediate and delayed posttests.

Data Analyses

To score for performance on L1>L2 recall (Posttests 1 and 3), a lexical production scoring protocol (LPSP-written) developed by Barcroft (2000) was used (Appendix C). This protocol is sensitive to learners' knowledge of both

fully and partially produced words, which is important given that learners tend to learn new words in bits and pieces (see Barcroft, 2002, for more on the LPSP-written as compared to other types of scoring methods). To score for performance on L2>L1 recall (Posttests 2 and 4), one point was given for each correct English translation. Blind scoring was used to score all of the posttests.

Each participant's total scores for the enhanced and unenhanced items on all four posttests were entered into a statistical analysis program and submitted to a series of analyses of variance (ANOVAs). In the first ANOVA, condition (experimental, control) was a between-subject independent variable; time (immediate, delayed) and measure (L1>L2 recall, L2>L1 recall) were within-subject independent variables; and score for enhanced items was the dependent variable. In the second ANOVA, the independent variables were the same, but score for unenhanced items was the dependent variable. In the third ANOVA, the independent variables were the same, but proportional score for enhanced items to total items (enhanced/total score) was the dependent variable. In the fourth ANOVA, the independent variables were the same, but proportional score for unenhanced to total items (unenhanced/total) was the dependent variable.

Results

Table 1. *Experiment 1 Results Based on Scores for Enhanced Items.*

Measure	*Time*	*Condition*	*N*	*Mean*	*Std. Dev*	*L1 > L2*
Immediate	Experimental	7	3.32	1.88		
Control	8	4.16	2.25		Delayed	Experimental
7	2.21	.67			Control	8
2.56	1.54	L2 > L1	Immediate	Experimental	7	3.86
2.19			Control	8	4.75	3.37
	Delayed	Experimental	7	3.57	1.13	
	Control	8	4.25	1.98		

Table 1 shows the raw score means for L1>L2 recall and L2>L1 recall for the 9 enhanced items on the immediate and delayed posttests for the experimental (9 of 24 items enhanced) and control (unenhanced) groups. The results of the first ANOVA revealed significant main effects for time, $F(1,13) = 11.35$, $p = .049$; for measure, $F(1,13) = 9.52$, $p = .009$; and for Measure x Time, $F(1,13) = 15.21$, $p = .002$. The significant Measure x Time interaction was due to a larger drop in L1>L2 recall means from Time 1 to Time 2 as compared to L2>L1 recall means. The significant main effect for time was due to higher scores at Time 1 (the immediate posttests) than at Time 2 (delayed posttests). The significant main effect for measure was due to higher scores on L2>L1 recall as compared to L2>L1 recall. No other significant main effects or interactions were revealed.

Table 2. *Experiment 1 Results Based on Scores for Unenhanced Items.*

Measure	*Time*	*Condition*	*N*	*Mean*	*Std. Dev*
L1 > L2	Immediate	Experimental	7	5.00	3.26
		Control	8	6.09	3.47
	Delayed	Experimental	7	2.21	.81
		Control	8	3.44	2.56
L2 > L1	Immediate	Experimental	7	6.43	2.57
		Control	8	8.88	4.52
	Delayed	Experimental	7	4.86	2.12
		Control	8	6.38	3.46

Table 2 shows results based on scores for the 15 unenhanced items in the list. The results of the second ANOVA revealed significant main effects for time, $F(1,13) = 17.18$, $p = .001$, and for measure, $F(1,13) = 39.46$, $p < .001$. The significant main effect for time was due to higher scores at Time 1 than at

Time 2. The significant main effect for measure was due to higher scores on L2>L1 recall as compared to L2>L1 recall. No other significant main effects or interactions were revealed.

Table 3. *Experiment 1 Results based on Enhanced/Total Score Proportions.*

Measure	*Time*	*Condition*	*N*	*Mean*	*Std Dev*
L1 > L2	Immediate	Experimental	7	.43	.13
		Control	8	.42	.10
	Delayed	Experimental	7	.50	.08
		Control	8	.53	.31
L2 > L1	Immediate	Experimental	7	.36	.09
		Control	8	.34	.10
	Delayed	Experimental	7	.43	.08
		Control	8	.44	.18

Table 3 shows the means for L1>L2 recall and L2>L1 recall based upon each participant's score for enhanced items divided by their total score (enhanced/total) as the dependent variable. The results of the third ANOVA revealed a significant main effect for measure, $F(1,13) = 7.73$, $p = .016$; but the effect of time did not reach significance, $F(1,13) = 4.25$, $p = .060$. The significant main effect for measure was due to higher scores on L2>L1 recall as compared to L2>L1 recall. No other significant main effects or interactions were revealed.

Table 4 shows the means for L1>L2 recall and L2>L1 recall based upon each participant's score for unenhanced items divided by their total score (unenhanced/total) as the dependent variable. The results of the fourth ANOVA revealed significant main effects for measure, $F(1,13) = 7.29$, $p = .016$; but the effect of time did not reach significance, $F(1,13) = 4.25$, $p = .060$. (Note that the third and fourth ANOVA were based on related proportion scores, enhanced:total score and unenhanced:total score, and therefore yield similar

statistical results.) No other significant main effects or interactions were revealed.

Table 4. *Experiment 1 Results based on Unenhanced/Total Score Proportions.*

Measure	*Time*	*Condition*	*N*	*Mean*	*Std Dev*
L1 > L2	Immediate	Experimental	7	.57	.13
		Control	8	.58	.10
	Delayed	Experimental	7	.50	.08
		Control	8	.47	.31
L2 > L1	Immediate	Experimental	7	.64	.09
		Control	8	.66	.10
	Delayed	Experimental	7	.57	.08
		Control	8	.56	.18

To summarize, the results of Experiment 1 revealed no significant effect for condition on performance on any of the posttest measures. Actual mean scores were higher for the control group on both L1>L2 recall and L2>L1 recall based on enhanced items recalled (Table 1) and unenhanced items recalled (Table 2), but these differences were not significant. The mean scores for the control and experimental groups on the L1>L2 recall and L2>L1 recall proportion measures (Tables 3 and 4) were also not significantly different. With regard to the other independent variables, significantly lower scores on delayed measures as compared to immediate measures were revealed, as were significantly lower scores on L1>L2 recall as compared to L2>L1 recall as measures of lexical knowledge. The significant Time x Measure interaction based on enhanced item scores (due to larger decreases between immediate

and delayed measures on L1>L2 recall as compared to L2>L1 recall) was not revealed based on unenhanced item scores or proportion scores. Overall, these results suggest that enhancing 9 out of 24 words did not have a significant effect the participant's lexical learning performance.

Experiment 2

Whereas Experiment 1 revealed no significant effects for enhancing 9 out of 24 words, Experiment 2 examined the effects of enhancing 3 out of 24 words, which was deemed to be a more distinct form of enhancement. By enhancing only 3 out of 24 words (as opposed to 9 out of 24), the enhanced words items in question become more distinct with respect to all of the items in the 24-item input set. Therefore, a positive effect for enhancement might be revealed in Experiment 2 although it was not revealed in Experiment 1 because the increased salience of more distinctly enhanced words may draw more processing resources towards them.

Research Questions

As stated previously, Experiment 2 addressed the third and fourth sets of research questions of the present study:

1. Does enhancing 3 out of 24 words in a vocabulary list affect learning rates for the 3 enhanced words? If so, is the effect positive or negative?
2. Does enhancing 3 out of 24 words in a vocabulary list affect learning rates for the other 21 words in the list? If so, is the effect positive or negative?

Participants

Participants in Experiment 2 were 21 English-speaking first-semester learners of Spanish (from the same participant pool used in Experiment 1) from a different section of first-semester Spanish at the same university. Twelve were females; nine were males. As in Experiment 1, the participants were from the same Spanish class and met same criteria: (a) their L1 was English, and (b) Spanish was not spoken regularly in their household.

Experimental Words and Procedure

The experimental words and procedure used in Experiment 2 were basically the same as those used in Experiment 1. However, on the enhanced version of word list in Experiment 2, only 3 words were enhanced (Appendix D). These words were a subset of the 9 words enhanced in Experiment 1.

Data Analyses

The scoring and data entry procedures used in Experiment 2 were basically the same as those used in Experiment 1. As in Experiment 1, all posttest

scores were submitted to a series of repeated measures analyses of variance (ANOVAs). Again, in the first ANOVA, condition (experimental, control) was a between-subject independent variable; time (immediate, delayed) and measure (L1>L2 recall, L2>L1 recall) were within-subject independent variables. Score for enhanced items was the dependent variable. In the second ANOVA, the independent variables were the same, but score for unenhanced items was the dependent variable. In the third ANOVA, the independent variables were the same, but proportional score for enhanced items to total items (enhanced/total score) was the dependent variable. In the fourth ANOVA, the independent variables were the same, but proportional score for unenhanced to total items (unenhanced/total) was the dependent variable.

Due to subject attrition in Experiment 2 between the immediate and delayed posttests in Experiment 2 (there was no attrition in Experiment 1), these four ANOVAS were based on a reduced sample of 17 participants from an original sample of 21 participants. Therefore, additional ANOVAs were conducted to examine the performance of the entire sample of 21 participants present for the immediate posttests only. In these analyses, time was excluded as a variable, leaving condition (experimental, control) as a between-subject independent variable, measure (L1>L2 recall, L2>L1 recall) as within-subject independent variable, and score as the dependent variable. The dependent variables in these ANOVAs were score for enhanced items, score for unenhanced items, proportion score for enhanced/total, and proportion score for unenhanced/total.

Results

Table 5. *Experiment 2 Results based on Scores for Enhanced Items.*

Measure	*Time*	*Condition*	*N*	*Mean*	*Std Dev*
L1 > L2	Immediate	Experimental	10	1.33	1.33
		Control	7	.50	.69
	Delayed	Experimental	10	.73	.80
		Control	7	.36	.45
L2 > L1	Immediate	Experimental	10	1.60	.97
		Control	7	1.00	.58
	Delayed	Experimental	10	1.00	.94
		Control	7	.71	.76

Full Analyses.

Table 5 shows means based on raw scores for L1>L2 recall and L2>L1 recall for the 3 enhanced items on the immediate and delayed posttests for the experimental (3 of 24 items enhanced) and control (unenhanced) groups. Based on the L1>L2 recall scores, the mean was 166% higher in the experimental group (1.33) than in the control group (.50) at Time 1 and 103% higher in the experimental group (.73) than in the control group (.36) at Time 2. Based on L2>L1 scores, the mean was 60% higher in the experimental group (1.60) than in the control group (1.00) at Time 1 and 41% higher in the experimental group (1.00) than in the control group (.71) at Time 2. The results of the first ANOVA revealed significant main effects for time, $F(1,15) = 16.48$, $p = .001$, and measure, $F(1,15) = 16.97$, $p = .001$. Despite the large differences between the control and experimental groups in means for enhanced items, the effect of condition was not significant, $F(1,15) = 1.98$, $p = .180$. The Time x Condition interaction approached significance, $F(1,15) = 3.70$, $p = .074$, due to a larger proportional drop in the mean from Time 1 to Time 2 for the experimental group as compared to the control group. The significant main effect for time was due to higher scores at Time 1 than at Time 2. The significant main effect for measure was due to higher scores on L2>L1 recall as compared to L2>L1 recall. No other significant main effects or interactions were revealed.

Table 6. *Experiment 2 Results based on Scores for Unenhanced Items.*

Measure	*Time*	*Condition*	*N*	*Mean*	*Std Dev*
L1 > L2	Immediate	Experimental	10	6.53	2.67
		Control	7	6.75	3.28
	Delayed	Experimental	10	4.50	2.87
		Control	7	4.25	1.06
L2 > L1	Immediate	Experimental	10	9.70	4.79
		Control	7	8.71	3.04
	Delayed	Experimental	10	8.40	3.73
		Control	7	7.29	2.93

Table 6 shows results based on scores for the 21 unenhanced items in the list. The results of the second ANOVA revealed significant main effects for time, $F(1,15) = 25.80$, $p < .001$, and for measure, $F(1,15) = 25.42$, $p < .001$. The significant main effect for time was due to higher scores at Time 1 than at Time 2. The significant main effect for measure was due to higher scores on L2>L1 recall as compared to L2>L1 recall. No other significant main effects or interactions were revealed.

Table 7. *Experiment 2 Results based on Enhanced/Total Score Proportions.*

Measure	*Time*	*Condition*	*N*	*Mean*	*Std Dev*
L1 > L2	Immedi-ate	Experime-ntal	9	.16	.08
		Control	7	.05	.07
	Delayed	Experime-ntal	9	.14	.09
		Control	7	.07	.09
L2 > L1	Immedi-ate	Experime-ntal	9	.16	.07
		Control	7	.09	.05
	Delayed	Experime-ntal	9	.10	.09
		Control	7	.09	.10

Table 7 shows the means for productive and receptive scores based upon each participant's score for enhanced items divided by their total score (enhanced/total) as the dependent variable. For this ANOVA, the experimental group sample was reduced by one because one participant received a score of zero for total enhanced words and therefore obtained no proportion score. Based on L1>L2 recall scores, the means were 222% higher in the experimental group (.16) than in the control group (.05) at Time 1 and 100% higher in the experimental group (.14) than in the control group (.07) at Time 2. Based on L2>L1 recall scores, the means were 78% higher in the experimental group (.16) than in the control group (.09) at Time 1 and 11% higher in the experimental group (.10) than in the control group (.09) at Time 2. The third ANOVA revealed a marginal effect for condition, $F(1,14) = 3.78$, $p = .072$, eta squared = .213; and significant effects for the Measure x Condition interaction, $F(1,14) = 6.22$, $p = .026$, eta squared = .308. The Measure x Condition interaction was due to higher mean (enhanced/total item proportion) scores for the experimental group based on L1>L2 recall (.15) as compared to L2>L1 recall (.13) and lower mean scores for the control group based on L1>L2 recall (.06) as compared to L2>L1 recall (.09) No other significant main effects or interactions were reveale

Table 8. *Experiment 2 Results based on Unenhanced/Total Score Proportions.*

Measure	*Time*	*Condition*	*N*	*Mean*	*Std Dev*
L1 > L2	Immediate	Experimental	10	.84	.08
		Control	7	.95	.07
	Delayed	Experimental	10	.86	.09
		Control	7	.93	.09
L2 > L1	Immediate	Experimental	10	.84	.07
		Control	7	.91	.05
	Delayed	Experimental	10	.90	.09
		Control	7	.91	.10

Table 8 shows the mean scores for L1>L2 recall and L2>L1 recall based upon each participant's score for unenhanced items divided by their total score (unenhanced/total) as the dependent variable. Means in the control group were higher in the control group than in the experimental groups based on all measures: based on L1>L2 recall, 13% higher at Time 1 and 8% higher at Time 2; based on L2>L1 recall, 8% higher at Time 1 and only 1% higher at Time 2. The fourth ANOVA revealed a marginal effect for condition, $F(1,14) = 3.78$, $p = .072$, eta squared = .213; and significant effects for the Measure x Condition interaction, $F(1,14) = 6.22$, $p = .026$, eta squared = .308. The Measure x Condition interaction was due to lower unenhanced/total item proportion scores for the experimental group based on L1>L2 recall (.84) as compared to L2>L1 recall (.86) and higher unenhanced/total item proportion scores for the control group based on L1>L2 recall as a measure (.95) as compared to L2>L1 recall as a measure (.93) No other significant main effects or interactions were revealed.

Table 9. *Experiment 2 Results Based on Time 1 (Immediate) Only.*

Dependent Variable	*Measure*	*Condition*	*N*	*Mean*	*Std Dev*
Enhanced Words	L1 > L2	Experimental	11	1.30	.96
		Control	10	.53	.62
	L2 > L1	Experimental	11	1.55	.93
		Control	10	1.00	.67
Unenhanced Words	L1 > L2	Experimental	11	6.82	2.71
		Control	10	7.00	3.03
	L2 > L1	Experimental	11	9.64	4.54
		Control	10	8.50	2.64
Enhanced/-Total Words	L1 > L2	Experimental	11	.14	.09
		Control	10	.05	.06
	L2 > L1	Experimental	11	.14	.08
		Control	10	.09	.06
Unenhanced/Total Words	L1 > L2	Experimental	11	.86	.09
		Control	10	.95	.06
	L2 > L1	Experimental	11	.86	.08
		Control	10	.91	.06

Partial Analyses

Table 9 shows scores for L1>L2 recall and L2>L1 recall based on enhanced item scores at Time 1 only. The first ANOVA for Time 1 only (conducted in light of subject attrition between Time 1 and Time 2), based on enhanced word scores, revealed a marginal effect for condition, $F(1,19) = 3.76$, $p = .068$, eta squared = .165, and a significant main effect for measure, $F(1,19) = 10.61$, $p = .004$. The significant effect of measure was due to higher scores on L2>L1 recall as compared to L2>L1 recall. No other significant main effects or

interactions were revealed. The second ANOVA for Time 1 only, based on unenhanced word scores, revealed a significant main effect for measure, $F(1,19) = 9.86$, $p = .005$, and no other significant main effects or interactions. The third ANOVA for Time 1 only, based on enhanced/total proportions, revealed a significant main effect for condition, $F(1,19) = 5.06$, $p = .037$, eta squared = .210. The effect of the Measure x Condition did not reach significance, $F(1,19) = 3.31$, $p = .085$. No other significant main effects or interactions were revealed. The fourth ANOVA for Time 1 only, based on unenhanced/total proportions, revealed a significant main effect for condition, $F(1,19) = 5.06$, $p = .037$, eta squared = .210. The effect of Measure x Condition did not reach significance, $F(1,19) = 3.31$, $p = .085$. No other significant main effects or interactions were revealed.

Two additional univariate ANOVAs for Time 1 only were conducted using L1>L2 recall only as the dependent variable in the first ANOVA and L2>L1 recall only as the dependent variable in the second. The results of the first ANOVA revealed a significant main effect for condition on L1>L2 recall, $F(1,19) = 4.67$, $p = .044$, eta squared = .197, due to higher scores for the enhanced group (see means and standard deviations under "enhanced words" in Table 9). The results of the second ANOVA indicated that the effect of condition on L2>L1 recall did not reach significance, $F(1,19) = 2.33$, $p = .144$, although the L2>L1 recall mean for the enhanced group was lower (see means and standard deviations under "unenhanced words" in Table 9).

To summarize, the results of Experiment 2 revealed that enhancing 3 out of 24 items did yield effects on performance on a number of posttest measures. Mean scores for recall of enhanced words and enhanced/total word proportions tended to be higher in the enhanced (experimental) group. When enhanced item was the dependent variable, recall performance of the enhanced group was (a) marginally higher in the first set of partial analyses and (b) significantly higher for L1>L2 recall but only marginally higher for L2>L1 recall in the final set of partial analyses. When enhanced/total proportion was the dependent variable, performance of the enhanced group was (a) marginally higher in the full analyses and (b) significantly higher in the partial analyses. The pattern for unenhanced items was different, however. When unenhanced item was the dependent variable, recall performance of the enhanced group was marginally ++in the full analyses, and when unenhanced/total proportion was the dependent variable, recall performance in the enhanced group was significantly *lower* in the partial analyses. Overall, these results suggest that enhancing 3 out of 24 words had a positive effect on learning rates for the 3 enhanced words but, as a consequence, also had a negative effect on learning rates for the other 21 unenhanced words.

Discussion

The combined results of Experiments 1 and 2 suggest four main findings for the present study. First, enhancing 9 out of 24 words in a vocabulary list *did not* affect learning rates for the 9 enhanced words. This finding is

supported by the null effect observed for enhancement on recall performance for enhanced words and enhanced/total proportions in Experiment 1. Second, enhancing 9 out of 24 words in a vocabulary list *did not* affect learning rates for the other 15 words in the list. This finding is supported by the null effect observed for enhancement on recall performance for unenhanced words and unenhanced/total proportions in Experiment 1. Third, enhancing 3 out of 24 words in a vocabulary list *did* affect learning rates for the 3 enhanced words, and the effect was *positive*. This finding is supported by the marginal and significant positive effects observed for enhancement on recall performance for enhanced words and enhanced/total proportions in Experiment 2. Fourth, enhancing 3 out of 24 words in a vocabulary list *did* affect learning rates for the other 21 words in the list, and the effect was negative. This finding is supported by the marginal and significant negative effects observed for enhancement on recall performance for unenhanced words and enhanced/total proportions in Experiment 2.

The finding that at least some form of enhancement yielded positive effects for learning enhanced items is consistent with previous studies that also found positive effects for enhancement, such as positive effects for grammar-oriented textual enhancement (Jourdenais et al., 1995; Shook, 1994; Simard, 2001) and positive effects for vocabulary-oriented textual enhancement in which word meaning is identified in different ways (Chun & Plass, 1996; Hulstijn, Hollander, & Greidanus, 1996; Watanabe, 1997). Despite the inherent differences between these previous discourse-level studies and the present discrete-item-oriented study, their combined findings speak to the general potential of input enhancement as a means of drawing learners' attention to targeted linguistic forms (both grammatical and lexical) and thereby increasing learning rates for those forms. It should be noted that the positive effects for enhancement in Experiment 2 of the present study were obtained via typographical manipulation only.

Although the purpose of discrete-item vocabulary lists in the present study was primarily methodological in nature (e.g., to control the entire input set and proportions of enhanced to unenhanced items), the positive effect for enhancement observed in Experiment 2 can also be interpreted with regard to pedagogical practices. When developing vocabulary lists for various chapters in language course textbooks, textbook developers may wish to enhance particularly important words in each list. The results of Experiment 2 suggest that if a sufficiently limited number of words in each list are enhanced (e.g., 3 of 24 or perhaps between 10-15% of the words in the list), the enhanced words may be learned more readily.

It is important to remember, however, that positive effects were obtained *only* for enhancement of 3 out of 24 words (Experiment 2) but not for enhancement of 9 out of 24 words (Experiment 1) in the present study. One explanation of these two findings concerns the relationship between distinctiveness and input enhancement. In the present study, enhancement of 3 out of 24 represented a more distinct form of enhancement than enhancement of 9 out of 24 words because the manner of presentation of the enhanced words in

a list with 3 of 24 words enhanced diverges to a greater degree from the manner of presentation of all of the items in that input set as compared to the manner of presentation of the enhanced words in a list with 9 of 24 words enhanced. This explanation, if correct, suggests that distinctiveness may have moderated the effect of enhancement in the present study. This finding speaks to the potential for bidirectional effects of enhancement in discrete-item vocabulary learning and should not be overgeneralized beyond this particular type of learning paradigm. However, future discourse-level enhancement studies may wish to pursue the issue of distinctiveness further.

If distinctiveness can moderate the effects of enhancement, only a sufficiently distinct type of enhancement may be able to yield a positive effect on acquisition rates for a target grammatical item or for a set of target vocabulary words. However, the types of manipulation that render a target item more or less distinct may also vary as a function of the nature of the target item. In the present study, the target items were new L2 words, and enhancing a smaller proportion of the overall input set yielded a positive effect on learning rates for the enhanced items. As mentioned earlier, however, in enhancement studies that target grammatical items, repeated examples of an enhanced grammatical form may be necessary in order to draw learners' attention to a pattern as opposed to individual words. In this case, other means of increasing the distinctiveness of the enhanced grammatical item may need to be explored, such as different variations on typographical manipulation. Future studies can explore this issue by comparing the relative effects of different types of enhancement other than alteration of the number of target items enhanced. Simard's (2001) finding that certain types of typographical manipulation affected form recognition performance differently than others represents an important step forward in this area, although additional research is warranted.

The finding that enhancing 3 out of 24 words yielded a positive effect on learning enhanced words as well as a negative effect on learning unenhanced words (based primarily on results for unenhanced/total proportion as the dependent variable) suggests that the effects of enhancement can be *bidirectional* in nature if one considers both target (enhanced) and nontarget (unenhanced) items in an input set. One ways of explaining this finding is to focus on overall processing resource allocation: When task demands are sufficiently high, such as when a learner is attempting to learn a set of new words in a restricted amount of time, drawing learners' attention and processing resources to certain words by increasing the salience of those words via a sufficiently distinctive form of enhancement can also decrease the learners' ability to attend to and to process other nontarget words in that input set, causing the rate at which nontarget words are learned to decrease. The results of Experiment 2 showing significantly lower unenhanced/total word proportion scores for the enhanced group are consistent with this explanation. These results speak to the potential for bidirectional effects of enhancement in discrete-item vocabulary learning and should not be overgeneralized beyond this particular type of learning paradigm. However, future discourse-level enhancement studies may wish to explore questions related to bidirectional effects as well: Does

enhancing one type of grammatical form in a text draw learners' attention away from and decrease learning rates for other types of grammatical form? Does enhancing one set of new words in a text draw learners' attention away from and decrease learning rates for other new words in the text?

From an instructional standpoint, because language instructors are interested in learners' overall linguistic development, it is important to consider how input enhancement affects the rate at which learners advance with regard to the variety of linguistic structures that can be presented in the input. How can the benefits of enhancement be maximized with regard to the acquisition of enhanced items while minimizing the potentially inhibitory effects of enhancement with regard to the acquisition of unenhanced items? This question presents a challenge for enhancement research, particularly with regard to the instructional value of enhancement. If future studies on grammar-oriented input enhancement address this question, it may be useful to consider the role of acquisition orders (e.g., based on findings such as those of Dulay & Burt, 1974) and learnability/teachability (see Pienemann, 1999) when doing so. If a grammatical form is enhanced at a time during acquisition when a learner is ready to acquire it, the positive effects of enhancing that form may be maximized. With regard to vocabulary items, on the other hand, it may be useful to consider word frequency and the functional utility of different words when making decisions about which words to enhance.

Summary and Conclusion

To summarize, the main findings of the present study on discrete-item vocabulary learning were (a) no effect for enhancing 9 out of 24 words on learning rates for the enhanced words, (b) no effect for enhancing 9 out of 24 words on learning rates for the unenhanced words, (c) a positive effect for enhancing 3 out of 24 words on learning rates for the enhanced words based on some but not all dependent measures, and (d) a negative effect for enhancing 3 out of 24 words on learning rates for the unenhanced words based on some but not all dependent measures. These findings suggest the need for future studies on the relationship between distinctiveness and enhancement and on the relationship between enhancement and its potential bidirectional effects on learning enhanced versus unenhanced items in the input.

Appendices

Appendix A

Instructions to Participants

Name _____ Section

DO NOT TURN OVER THIS SHEET UNTIL INSTRUCTED TO DO SO....

Instructions: On the other side of this sheet are 24 Spanish words and their English translations. Please do your best to learn the words. You will have 9.6 minutes to study the words. After that time, posttests will be administered. On one posttest, you will be asked to write Spanish words when presented with English words. On another posttest, you will be asked to write English words when presented with Spanish words. Please do not speak with other students during the experiment, and study the words from your own sheet only. Good luck on learning the words!

Appendix B

Enhanced Version of List in Experiment 1:

lupa = magnifying glass chiringa = kite clavo = nail *sacudidor* = feather duster tenazas = pliers aletas = flippers *imán* = magnet regadera = sprinkler clavija = plug *embudo* = funnel pinza = clothespin pala = shovel *estantería* = shelf *rastrillo* = rake serrote = saw candado = lock *taladro* = drill gancho = hook cabestrillo = sling *balde* = bucket destornillador = screwdriver resbaladilla = slide *borla* = tassel *asa* = handle

Appendix C

Lexical Production Scoring Protocol (LPSP-written)

.00 points *.25 points* *.50 points* *.75 points* *1 point*

None of word is written; this includes: • nothing is written • the letters present do not meet any "for .25" criteria • English word only is written 1/4 of word is written; this includes: • any 1 letter is correct • 25-49.9% of the letters are present • correct # of syllables 1/2 of word is written; this includes: • 25-49.9% of letters correct • 50-74.9% of letters present 3/4

of word is written; this includes: • 50-99.9% of letters correct • 75-99.9% of letters present • 100% letters correct but other letters added Entire word is written; this includes: • 100% letters correct • 100% letters correct with accent added or omitted

Instructions: (1) "Correct" refers to any letter written and placed in its correct position within a word; "present" refers to any letter written but not placed in its correct position. (2) Determine percentages by dividing letters correct and letters present by the number of letters in the target word. If more letters are written than are in the target word, divide by the larger number. (3) If the same target word is written more than once, score it only once in the space where it should be written or, if it is not written in the correct space, score it in the first space where it is written based upon the target word for that space.

Appendix D

Enhanced Version of List in Experiment 2:

lupa = magnifying glass chiringa = kite clavo = nail *sacudidor* = feather duster tenazas = pliers aletas = flippers imán = magnet regadera = sprinkler clavija = plug *embudo* = funnel pinza = clothespin pala = shovel estantería = shelf rastrillo = rake serrote = saw candado = lock taladro = drill gancho = hook cabestrillo = sling *balde* = bucket destornillador = screw-driver resbaladilla = slide borla = tassel asa = handle

References

Barcroft, J. (2000). *The effects of sentence writing as semantic elaboration on the allocation of processing resources and second language lexical acquisition.* Doctoral Dissertation, University of Illinois at Urbana-Champaign, Urbana, IL.

Barcroft, J. (2002). Semantic and structural elaboration in L2 lexical acquisition. *Language Learning, 52, 2,* 323-363.

Chun, D. M., & Plass, J. L. (1996). Effects of multimedia annotations on vocabulary acquisition. *Modern Language Journal, 80,* 183-198.

Dulay, H. C., & Burt, M. K. (1974). Natural sequences in child second language acquisition. *Language Learning, 24,* 37-53.

Eysenck, M. W. (1979). Depth, elaboration, and distinctiveness. In L. S. Cermak and F. I. M. Craik (Eds.), *Levels of processing in human memory.* Hillsdale, NJ: Lawrence Erlbaum.

Going, M., & Read, J. D. (1974). Effects of uniqueness, sex of subject, and sex of photograph on facial recognition. *Perceptual and Motor Skills, 39,* 109-110.

Hulstijn, J. H., Hollander, M., & Greidanus, T. (1996). Incidental vocabulary learning by advanced foreign language students: The influence of marginal glosses, dictionary use, and recurrence of unknown words.

Modern Language Journal, 80, 327-339

Jourdenais, R., Ota, M., Stauffer, S., Boyson, B., & Doughty, C. (1995). Does textual enhancement promote noticing?: A think aloud protocol analysis. In R. W. Schmidt (Ed.), *Attention and awareness in foreign language learning* (Technical Report #9, pp. 183-216). Honolulu, HI: University of Hawai'i, Second Language Teaching and Curriculum Center.

Leow, R. (1997)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. (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.

Overstreet, M. (1998). Text enhancement and content familiarity: The focus of learner attention. *Spanish Applied Linguistics, 2,* 229-258.

Pienemann, M. (1999). *Language processing and second language development: Processability theory.* Amsterdam: John Benjamins.

Sharwood Smith, M. (1991). Speaking to many minds. *Second Language Research, 7,* 118-132.

Sharwood Smith, M. (1994). Input enhancement and 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. (2001). *Effet de la mise en évidence textuelle sur l'acquisition de différente marques du pluriel en anglais langue seconde auprès de jeunes francophones de première secondaire.* Doctoral dissertation, Université Laval, Québec.

Watanabe, Y. (1997). Input, intake, and retention: Effects of increased processing on incidental learning of foreign language vocabulary. *Studies in Second Language Acquisition, 19,* 287-307.

Wong, W. (2000). *The effects of textual enhancement and simplified input on comprehension and the acquisition of non-meaningful grammatical form*. Unpublished Doctoral Dissertation, University of Illinois at Urbana-Champaign, Urbana, IL.

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