

# A review of the effect of textual enhancement on L2 learners' grammar acquisition: An analysis of topic familiarity and TE types

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## Abstract

The relationship between textual enhancement and L2 learners' grammar acquisition has been widely explored by researchers, while mixed results were provided by various empirical research. This review aims to examine whether textual enhancement has a positive impact on the grammar acquisition of second language learners. Furthermore, the possible concurring moderating factors of topic familiarity and textual enhancement type are discussed in terms of their impact on form acquisition. The review concludes by acknowledging the challenges in definitively establishing the positive impact of textual enhancement on form acquisition, emphasizing the need for rigorous empirical research and critical evaluation of outcomes to enhance the integration of grammar instruction into meaning-based approaches.

**Keywords** textual enhancement, grammar acquisition, topic familiarity, textual enhancement type, second language acquisition

## 1. Introduction

The perceived importance of L2 instructions and input enhancement was not put forward at the very beginning. Opposing Krashen's (1985) argument that deliberate formal grammar instructions were unnecessary, empirical studies have shown that sole exposure to the input is not sufficient for successful form acquisition (Schmidt, 1983; Swain, 1985) and the occurrence of successful SLA has to involve learners' attention to certain linguistic forms (Doughty, 2001; Robinson, 1995; Schmidt, 2001). Following Sharwood Smith's (1993) proposal of using the input enhancement approach as a way to attract learners' attention to the targeted forms and Schmidt's (1995) noticing hypothesis, the input enhancement approach was introduced as a way of focus on form, aiming to capture learners' focus on the specific forms being targeted. Among the various techniques, textual enhancement was widely used in empirical studies to examine the effectiveness of the enhancement techniques on grammar acquisition because it is a less obtrusive technique to implicitly draw learners' attention to the target forms (Lee, 2021). Textual enhancement aims to make certain parts of the input texts (written or oral) more salient and thereby to facilitate form-meaning connections (Benati, 2021). Typographical cues such as italicizing, underlining, embolding and coloring are commonly used in the related studies.

Many empirical studies have shown inconsistent results as to the influences of textual enhancement on grammar acquisition due to methodological idiosyncrasies

(Han et al., 2008). Some of them support the hypothesis that textual enhancement has positive effects on form acquisition (Doughty, 1991; Shook, 1994; Lee, 2007; Al-Shammari & Sahiouni, 2023). Some provide evidence of the moderate effect of the enhancements on noticing but not on acquisition (Winke, 2013). Nonetheless, some other studies showed no effects on form acquisition (Overstreet, 1998; Leow, 2001; Izumi, 2002; Wong, 2003). The divergence can be attributed to many variables, such as research designs and other moderating factors (Lee and Huang, 2008; Benati, 2021). A moderating variable, also known as a moderator, is any factor that has the potential to influence the dependent variables (Dodge et al., 2006, as cited in Wu, 2022).

In a meta-analytic review by Lee and Huang (2008), 16 primary studies were studied for investigating the relationship between visual input enhancement (VIE) and grammar learning. Lee and Huang (2008) categorized the variables in the selected studies into four parts: publication characteristics, learner differences, research design and treatment intensity. In order to find out the magnitude of VIE's impact on grammar acquisition, Cohen's *d* values (Cohen, 1988) were calculated by comparing the mean scores of the experimental group and the comparison groups on immediate posttest assessments. After analyzing the data, the authors found that the experimental group with VIE treatment outperformed the comparison groups by 0.22 standard deviation units ( $d = 0.22$ ), which indicated a small-size effect in accordance with Cohen's (1988) suggestions that *d* values around 0.20 should be considered as small effects. However, Lee and Huang (2008) also pointed out that the result need to be

considered cautiously because the comparison groups were also provided with other interventions, which means those groups were not true control groups. Additionally, Lee and Huang (2008) also found a negative effect of VIE on learners' meaning processing. The idea provided in this meta-analysis review is that learners may have difficulty simultaneously focusing on both form and meaning, which lead to the consideration that topic familiarity may facilitate the effect of textual enhancement on learners' grammar acquisition since it may help free some cognitive resources from meaning processing thus making the form acquisition more salient (Lee, 2007). Benati (2021) later pointed out that input enhancement might facilitate learners' notice for grammatical forms and mentioned that many studies on textual enhancement have involved some other variables (e.g., explicit instruction, other input enhancement types such as input flood), which resonates with Lee and Huang's (2008) conclusion that the small-size effect of VIE on grammar acquisition has to be considered cautiously since the comparison groups are not real control groups. Benati (2021) further investigated the offline and online effects of textual enhancement and also provided mixed results. When comparing the enhancement with explicit instruction, Doughty (1991) found a positive effect of salient visual clues on the form acquisition, while an online study by Cintrón-Valentín and Ellis (2015) reported no differences between the typographical enhancement group and the control group with explicit treatment. When comparing textual enhancement with other input enhancement types, offline studies unsurprisingly offered mixed results. Some provided positive results (Shook, 1994; Rassaei, 2015; Wong, 2002; Izumi, 2002; Simard, 2009; LaBrozzi, 2014), while some others offered less favorable effects (Overstreet, 1998; Leow et al., 2003; Boers et al., 2017; Meguro, 2017). Simard's (2009) and LaBrozzi's (2014) research stand out by investigating the different impacts of certain typographical cues, which leads to the consideration of regarding textual enhancement type as a possible moderating factor in this review. As for online effects, most studies demonstrated a positive influence (Simard and Foucambert, 2013; Issa et al. 2015; Alsadoon, 2015; Lee and Révész, 2020). Winke (2013) provided a different result by showing that enhancement facilitated learners' noticing but not necessarily the acquisition of the target forms. This result calls for further exploration of the relationship between noticing and the acquisition of the target forms. With the lack of further investigation into the possible moderating factors of topic familiarity and textual enhancement type, this review aims to fill the gap and analyze the effects of these two elements in detail.

Based on the mixed results in previous literature, it is difficult to firmly state whether textual enhancement has a positive effect on the form acquisition of L2 learners due to divergent research designs (e.g., measures of enhancement, control groups, textual enhancement types, and intensity of treatment) and salient learner differences (e.g., prior knowledge of target forms, topic familiarity, age, L2 proficiency, etc.). In accordance with the rationale stated before, this review will examine the roles topic familiarity and enhancement types play in examining the effect of textual enhancement on learning the target forms.

To identify the effectiveness of the two factors, this review will examine empirical studies focusing on the relationship between textual enhancement and grammar learning with specific consideration of the possible influence of the two aforementioned variables.

## 2. Possible moderating factors

### 2.1. Topic Familiarity

The efficacy of textual enhancement cannot be identified without measuring the influence on comprehension, as the proposal of typographical enhancement is premised on the learners' acquisition of meaning (Han et al., 2008). However, many studies have neglected the need to measure comprehension, thus it is unclear as for whether textual enhancement may have a negative effect on meaning acquisition. Also, as a concurring factor in empirical studies, topic familiarity did not arouse much of SLA researchers' attention. Therefore, the related empirical studies are limited (Overstreet, 1998; Lesser, 2004, 2007; Lee, 2007; Combs, 2008) and inconclusive results are provided. However, it is reasonable to consider topic familiarity as a potential moderating factor for the following reasons.

By involving culturally familiar topics, researchers would be able to better detect the imbalance for meaning and form processing, thus being able to investigate whether input with familiar topics can positively influence the impact of textual enhancement on both meaning and form acquisition. Different from native speakers, L2 learners need to attend to both meaning and form when reading an enhanced text (Lee, 2007). Lee and Huang (2008) pointed out that a slight negative impact of VIE on meaning processing was shown in the meta-analysis review, which indicated a possible competition between learners' meaning and form processing. As many studies have shown that textual enhancement successfully drew learners' attention to form (Simard and Foucambert, 2013; Issa et al., 2015; Lee and Révész, 2020), it is plausible to consider whether the enhanced texts with familiar topics would facilitate the impact of textual enhancement on form acquisition based on the hypothesis that cognitive resources freed from meaning processing would be used for form acquisition.

Lee (2007) investigated the effects of textual enhancement and topic familiarity on learners' acquisition of both the target grammatical form of passive voice and the comprehension of meaning. Textual enhancement was utilized in this research because of its positive effects on drawing attention to form and the less obtrusiveness characteristic of this focus-on-form technique (Doughty, 1991; White, 1998). Culturally familiar topics were also employed to test the hypothesis that attentional resources freed from reading comprehension could be available for form acquisition. Four teachers and 259 high-school students who had been studying English as a foreign language for nearly four years participated in this experimental study. Students were randomly allocated to four treatment groups based on the two manipulated variables: textual enhancement and topic familiarity, i.e., +E/ +F, +E/ -F, -E/ +F, -E/ -F. To ensure the

comparability of these groups, in the first session, a reading proficiency test was administered to check the reading ability of these students, and a form correction task was provided to test whether there was a preexisting difference of grammatical knowledge among groups. In the following two sessions, students were exposed to two treatments reading the same articles (with textual enhancement or baseline version) individually and discussing with their classmates. However, in the last session, participants read articles with different familiarity and experienced enhanced or baseline version of the texts and then took the two post-tests.

The results of correction task demonstrated a positive effect of textual enhancement on students' target form acquisition and negligible impact of topic familiarity. Furthermore, scores from pretest and post-test showed a statistically significant difference among +E groups, and no measurable differences among -E groups, which justified the beneficial effects of textual enhancement on the grammar acquisition. In terms of free-recall task, +F groups performed better than -F groups, and students exposed to baseline version scored better than those exposed to enhanced version texts. The scores of the recall task supported the hypothesis that topic familiarity affected comprehension positively, whereas textual enhancement could have detrimental effects on meaning acquisition. Moreover, in order to investigate whether attentional resources freed up from meaning comprehension could be available for form acquisition, the scores of correction and recall tasks were compared. However, those scores indicated no significant correlations among +E groups, which contradicted the author's previous hypothesis.

Lee's research has its significance in the following aspects. First, the choosing of tasks to measure form and meaning acquisition is in accordance with the ample theoretical rationales and the author's critical analysis of previous empirical studies, thus increasing the reliability of the specific research. Among various tasks to test acquisition of forms, form correction task was chosen because of the avoidance of random guessing from the learners (Wong, 2003). Compared with other measures for comprehension, a free-recall task was claimed to be the best test for examining the learners' capability to recall information (Overstreet, 2002) and checking the comprehension without involving the bias developed from prepared test questions. Second, the rigorous design is noteworthy and can offer valuable experiences to other researchers. For instance, preliminary differences were eliminated by the author through two pretests for both form and comprehension. In spite of these advantages, there are some limitations in this study. The author mentioned other confounding factors which may have intervened in the research on textual enhancement, such as treatment conditions and measure of attention. Even though Lee has mentioned the relatively short period of exposure time for target enhancement, the total time for enhancement exposure in this study is 60 minutes, which is not significantly longer than other previous studies. And another limitation of this study is the lack of follow-up study to investigate the retainment of grammatical acquisition outcomes in this study. Furthermore,

regardless of the aim to test the hypothesis that textual enhancement can attract learners' attention to form and that attentional resources released from comprehension could be reallocated to form acquisition, the attention was not measured in this study, compared with Izumi's (2002) work, which demonstrated the positive effects of enhancement on noticing but not on acquisition.

Winke (2013) partially replicated Lee's (2007) research with the aim to investigate two research questions: a) whether learners' visual attention can be drawn to targeted forms; b) what are the effects of textual enhancement on form and meaning comprehension. Two modifications were made in this study. First, the learners' proficiency was measured through an outside method since the author thought that previous studies on input enhancement lack independent measurements. Second, an eye-tracking technique was recruited to measure noticing objectively and the data was analyzed to examine whether textual enhancement draws the attentional resources to target forms. Eighty college students with intermediate-level English capability volunteered in the study, while due to the failure of camera lens calibration, only 55 students' data were collected and analyzed in this study. The group of participants has various L1 backgrounds, but a majority of them speak Mandarin Chinese as L1. In terms of the materials chosen in this research, pretests and post-tests were based on those developed by Lee (2007). An authentic text rather than inauthentic one was chosen and modified. A free-recall task was employed for assessing the reading comprehension. Volunteers finished the tasks one at a time and a monocular rather than binocular eye-tracking method was utilized due to the more accurate results. After finishing reading the text, the volunteer would move to take the free-recall task and post-test.

Eye-tracking data was analyzed to test whether enhancement affects noticing and makes the forms more salient for learners (research question a). The results indicated that the textual enhancement drew participants' attention to target forms in some ways (rereading the forms and visiting the enhanced passive forms more frequently), while enhancement did not increase initial processing, at least immediately. Therefore, the results in this study implied that textual enhancement triggered noticing, while the amount of noticing could not promise immediate form acquisition. To test the effects of enhancement on form acquisition and meaning comprehension (research question b), the gains scores (difference between pre and post form correction task scores) and comprehension test scores were analyzed through independent-samples t-tests. Winke (2013) concluded that in the context of this study, no significant difference of both gain scores and comprehension test scores was found among unenhanced and enhanced groups, in spite of the slightly different performance, thus indicating no trade-off effect of typographical enhancement on meaning processing.

Since Winke's (2013) study is a partial replication of Lee's (2007) research, it is difficult to compare the effects of textual enhancement and topic familiarity. First, topic familiarity was not investigated as an independent variable in Winke's study because the researcher gave no

description of whether the subjects were familiar with the topic of the reading material. Besides, the subjects were also different in the number, L1 background, age and L2 language proficiency, so learner difference could also influence the effect of enhancement on meaning and form processing. Nonetheless, Winke's study did provide some insights for further exploration on the relationship between noticing and form acquisition and on whether there is a correlation between meaning and form processing of L2 learners.

Apart from the aforementioned two studies, some other research also provided varied effects of topic familiarity and input enhancement on learners' comprehension and form acquisition. Overstreet (1998) examined the concurrent effects of topic familiarity and input enhancement and found a positive influence of input with familiar topics on meaning acquisition and no effect of enhancement on the learning of form. However, it was somewhat overreaching to conclude that input enhancement can draw learners' attention away from meaning since other variables may interfere with the results. Combs (2008) also examined the influence of topic familiarity and textual enhancement on learners' form acquisition and found no significant impact of these two variables by measuring the pre-test and post-test scores, with further pointing out the potential concurrent factors of learner readiness, treatment frequency and enhancement type.

According to the analyses above, it can be inferred that topic familiarity might have a positive effect on L2 learners' reading comprehension, but not necessarily the acquisition of targeted forms.

## 2.2. Textual enhancement type

Limited research has been conducted as for the impact of textual enhancement types on grammar acquisition in second language acquisition field, with many previous studies focusing on the influence on L1 test performance, retention, and comprehension (LaBrozzi, 2014).

With a closer investigation of previous research, Simard (2009) implied that the inconsistent results could be attributed to the format (number and types) of enhancement cues in the tasks. To answer the research question of whether the enhancement format has a differential influence on intake, Simard utilized an experimental split-plot design with between-group comparisons to measure the learners' intake of English plural markers. One hundred eighty-eight subjects who were French-speaking secondary students in Quebec participated in the research, and were divided into eight groups (one control group and seven experimental groups). The subjects were sequentially presented with a text and a familiar reading task. After comparing the scores of multiple-choice recognition tests and the information transfer task, Simard found that a specific type and a combination of cues (capital letters, a combination of three types) promoted better scores among subjects. Besides, the number of typographical cues matters according to the result of the study, which indicated a possible saturation effect with multiple typographical cues provided. However, there are some limitations in the study, which call for

cautious consideration of the research outcomes. Better measurement instruments can be used to test learners' noticing since textual enhancement may be insufficient for immediate occurrence of acquisition (Sharwood Smith, 1993). Besides, both the multiple-choice and information transfer task cannot prevent learners from randomly guessing the correct answer or correct order, thus failing to precisely investigate the L2 learners' form and meaning acquisition.

LaBrozzi (2014) intended to examine the effects of six different types of textual enhancement (underlined, italicized, bolded, capitalized, increased in font size, and change in font) on form recognition and meaning acquisition, so as to shed some light on explaining the mixed results from previous research. As a partially replication of Simard's (2009) research, this work has some modifications. Firstly, the six types were used individually and thus were not mixed to test the integrate influence. Moreover, only part the word (target morpheme) rather than the entire one was enhanced. Secondly, the participants were college students, compared with Simard's (2009) study in which the learners involved were 11 to 12 years old. Lastly, the influences on reading comprehension were also considered in this study. After the pretest of the translation task, 125 college students who were native English speakers and were learning Spanish as a second language participated in the current research and they were divided into seven groups: one control group and six enhanced groups. The chosen target form was the Spanish preterit tense of verb ending with "-er". The choice was based on the rationale that this form lacked salience and the changes happened within the verb, which rendered the form recognition even more difficult. Translation task and multiple-choice task were designed to measure learners' form recognition and meaning acquisition respectively.

The result revealed that the influence of textual enhancement on form recognition varied among types. But LaBrozzi (2014) explained that future studies were needed to testify the claim that the saliency in the increased font size text compelled the learners to draw on their previous knowledge to finish the translation task. On the other hand, to measure the influence of enhancement types on meaning comprehension, the scores of the multiple-choice comprehension questions which were used to check the general comprehension of the text showed no significant difference among groups, which was explained by the researcher that learners were able to concentrate on meaning and were not distracted by typographical cues. The author concluded that the enhancement type of increased font size contributed to better performance in the translation task in this specific study and utilizing individual enhancement technique failed to draw learners' attention from meaning comprehension.

LaBrozzi's work (2014) is valuable in that it tests the effects of an individual enhancement technique, rather than a combination of various techniques, on both form and meaning acquisition of adult L2 learners. Nonetheless, some limitations exist in this study. First, the number of participants was small, and a larger group of learners in this experiment may lead to outcomes which would demonstrate significant difference among groups. Second,

the multiple-choice task might involve some degree of random guessing from learners, thereby making the outcomes less reliable. Moreover, there was an overlap of form recognition test and meaning comprehension investigation within both the translation and multiple-choice tasks, which may contribute to inaccurate measurement for noticing and acquisition. For further explanation, in the translation task, successful learners had to understand both the tense and meaning, while in the other task, learners were given 20 items related to acquiring the present and preterit tense. Although the scores were collected separately (marked as general, present, and preterit), the outcomes of the two tasks may not illustrate directly pertinent influences of textual enhancement on both form acquisition and meaning comprehension. Lastly, contrary to Overstreet's (1998) suggestion that textual enhancement should address only one grammatical form, two linguistic forms (present and preterit) were involved in this experiment, while not enough rationale was provided by the author.

The aforementioned two studies indicate the different impacts of various textual enhancement types. However, it is relatively difficult to find out which one or which combination of the enhancement types can better facilitate learners' form acquisition because of other interfering variables and a lack of discussion on the benefits of varied textual enhancement types (Lee, 2021).

### 3. Conclusion

This review paper intends to answer two research questions: a) Does textual enhancement have a positive effect on L2 learners' grammar acquisition? b) How do the two possible moderating factors (topic familiarity and textual enhancement types) influence the learning outcome?

Although the psycholinguistic mechanisms as to the relationship between attention and L2 acquisition are still open to debate, there is a consensus among researchers that focal attention of targeted items is necessary for successful L2 processing. In VanPatten's input processing theory (1996, 2002), the feature of limited attentional resources was pointed out and the prediction that those resources would be directed primarily at meaning before form was given. Based on this rationale, the aforementioned four empirical studies were analyzed in detail because they all consider the effects of textual enhancement on form and meaning comprehension, with specific consideration on the two possible moderating factors: topic familiarity and textual enhancement types. Besides, participants of these research all had previous knowledge of the targeted forms but failed to acquire them based on the pretest for selection. The reason for choosing learners with prior knowledge is in line with outcomes of previous research, which showed that textual enhancement technique was ineffective without the basis of previous understanding (Leow et al., 2003; Wong, 2003; Lee, 2007).

Nonetheless, this review is not sufficient to generalize a clear answer to the two research questions, based on the theories and current empirical studies. As mentioned

before, the effects of textual enhancement alone can hardly be correctly detected and assessing form acquisition through tasks is not equal to measuring the impacts of input enhancement, since there are a considerable number of covarying factors such as research design, age, measurement differences, L1, and L2 proficiency, etc. Moreover, due to the limited studies to compare, the impact of topic familiarity and enhancement types on grammar acquisition cannot be ascertained, which calls for further investigation with more rigorous design and control of covarying factors. Therefore, it is impossible to match all of them to prepare comparable conditions for researchers. Furthermore, even if the positive effects of textual enhancement on triggering noticing are justified, the influences of input enhancement on the actual form acquisition are ambiguous.

In spite of the ambiguity of effects, the current study is valuable in the fact that the importance to investigate the impact of textual enhancement on both form and meaning acquisition is put forward, which calls for future research on more detailed online measurements to test the effect of input enhancement on noticing as well as the relationship between noticing and the actual grammar acquisition. Besides, this review argues that the two possible moderating factors are underestimated due to the difficulty of research design and a lack of previous empirical studies. Furthermore, this paper tends to offer valuable insights for further analysis and discussion on both measuring the influences of textual enhancement and utilizing this technique in the classroom settings. It is expected that the actual teaching experiences will provide important feedback to researchers to better investigate the effects of this specific input enhancement technique in the field of second language acquisition.

Textual enhancement, as a pedagogical intervention, is a technique employed to highlight specific aspects of written input, aiming to assist learners in recognizing the target form and ultimately establishing meaningful connections between form and meaning. Given the implicit and abstract nature of language, it is reasonable to contemplate the utilization of input enhancement instead of explicit instruction as a viable method for integrating a form-focused element into a broader communicative approach to language teaching (Benati, 2021). Based on the inconsistent results of previous empirical studies and the conclusion of this review paper, EFL teachers are encouraged to integrate this technique in classroom settings by carefully considering the concurring factors (e.g. topic familiarity, enhancement types, L2 proficiency, learning style, age, etc.), choosing the enhancement type or the combination of the typographical types wisely, and adjusting to the changing needs of learners flexibly.

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### Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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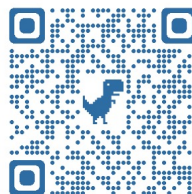
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