



THE ROLE OF TEXTUAL ENHANCEMENT IN L2 GRAMMAR ACQUISITION: A REVIEW OF MODERATING FACTORS AND EMPIRICAL FINDINGS

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Abstract

A substantial body of research has investigated the relationship between textual enhancement and L2 grammar acquisition, yet the findings remain inconclusive. This review seeks to assess whether textual enhancement can effectively facilitate grammar learning among L2 learners. Additionally, it explores potential moderating factors, such as topic familiarity, the characteristics of the target linguistic structures, and the specific type of textual enhancement used in the acquisition process. The review ultimately highlights the difficulties in confirming a consistent positive effect of textual enhancement on grammar learning and underscores the need for more thorough empirical research, as well as an in-depth examination of current findings, to improve the incorporation of grammar instruction into meaning-centered teaching approaches.

Keywords

Textual Enhancement, Input Enhancement, Typographical Cues, Topic Familiarity, Language Structure Complexity, L2 Grammar Acquisition

1. Introduction

According to VanPatten (2002), learners require input as an essential factor for their L2 development. However, merely providing input in the target language might not be enough for learning to occur (Swain, 1985; Doughty & Williams, 1998), as learners may either fail to notice the input or struggle to process it effectively, hindering their L2 development. A substantial body of research has shown that L2 learners do not necessarily acquire everything they are exposed to (Sharwood Smith, 1993). A key factor determining whether input becomes intake is the level of attention given to it (Robinson et al., 2012; Schmidt, 1990, 2012).

Textual enhancement (TE) is employed to increase the saliency of input in written or spoken texts, aiming to help learners notice key grammatical features and ultimately improve their acquisition (Sharwood Smith, 1993; Schmidt, 1995; Nassaji & Fotos, 2011). TE works by making certain elements of input—whether written or spoken—more salient, thereby promoting form-meaning associations (Benati, 2021). This form-focused approach has since been widely applied, with TE emerging as a popular technique in empirical studies due to its minimally invasive nature, subtly directing learners' attention towards target structures (Lee, 2021). Commonly employed methods in such research include typographical modifications like italics, underlining, bold text, and colour.

Numerous empirical studies have yielded mixed results regarding the efficacy of TE on L2 grammar acquisition (for reviews, see Han et al., 2008). TE has been shown to capture L2 learners' attention (White, 1998; Winke, 2013) and facilitate the noticing of target forms (Izumi, 2002; Jourdenais et al., 1995; Leeman et al., 1995; Simard et al., 2013). Eye-tracking studies also revealed that learners fixated significantly longer on enhanced elements (Winke, 2013). As a result, enhancing target forms contributed to their acquisition (Doughty, 1991; Lee, 2007; Al-Shammari & Sahiouni, 2023), subsequent production (Alanen, 1995; Jourdenais et al., 1995), and the generalization of L2 rules (Robinson, 1997). On the contrary, some studies have not shown input enhancement (IE) to be effective in improving L2 learners' noticing (Leow, 2001; Leow et al., 2003), or acquisition of L2 grammatical forms (Overstreet, 1998; Izumi, 2002; Wong, 2003). These divergent findings are likely due to various factors, including differences in study design and the presence of moderating variables (Benati, 2021). A

moderating variable, or moderator, is any element that may influence the relationship between the independent and dependent variables, potentially affecting the outcome (Wu, 2022).

Regarding the influence of moderating variables, Lee and Huang's (2008) meta-analysis produced significant findings. The study systematically synthesized 16 empirical studies and calculated aggregate effect sizes. Findings revealed that learners who received texts with enhanced target grammatical features showed only marginal improvement compared to those reading unenhanced texts with the same forms ($d = 0.22$). A slight negative effect on learners' meaning processing was also observed ($d = -0.26$), suggesting a potential tension between form and meaning. This led to the hypothesis that familiar topics could enhance the effects of TE on grammar acquisition by reducing the cognitive load required for processing meaning, thereby allowing greater focus on form (Lee, 2007). Benati (2021) supported this perspective, suggesting that IE can aid learners in noticing grammatical structures. Nevertheless, he highlighted that many studies on TE include other variables, such as focus-on-forms (FonFs) or alternative IE strategies. This complexity reinforces Lee and Huang's (2008) caution that the modest impact of VIE on L2 grammar learning should be cautiously considered, especially due to the absence of true control groups in these studies.

Offline studies on the efficacy of TE on L2 grammar acquisition yielded mixed results. Some research supports the positive impact of TE, while others present a more complex or even negligible relationship. LaBrozzi (2014) and Simard (2009) found positive effects of TE, with LaBrozzi demonstrating improved recognition of Spanish tenses through font size increases, and Simard noting that various typographical cues led to improved intake of grammatical forms. Notably, Simard (2009) and LaBrozzi (2014) examined how different typographical cues affect learning outcomes, suggesting that the type of TE could be a moderating factor in the efficacy of TE. Wong (2002) similarly highlighted the effectiveness of TE in facilitating learners' processing of written forms without detracting from overall comprehension, particularly in written modalities. Rassaei's (2015) study further supported the efficacy of TE, showing that enhancing the saliency of input was more effective than simply increasing the frequency of target forms (input enrichment) in developing English article usage among Persian EFL learners. Comparing enhancement techniques with explicit instruction in the acquisition of L2 grammar, Doughty (1991) and Shook (1994) found that VIE positively impacted form acquisition when comparing enhancement techniques to explicit instruction.

In contrast, several studies presented less favourable results regarding the efficacy of TE (Overstreet, 1998; Leow et al., 2003; Boers et al., 2017; Meguro, 2017). Overstreet (1998) found that TE led to negative effects on comprehension, as learners were distracted from processing meaning. Leow et al. (2003) similarly observed that TE did not significantly enhance intake or comprehension, suggesting that TE alone may not be sufficient to promote grammar learning. Boers et al. (2017) and Meguro (2017) echoed these findings, with Meguro specifically reporting that TE had limited effects on promoting the acquisition of complex grammatical structures in Japanese learners of English. Overall, the research suggests that while TE can be beneficial, particularly in written modalities, its efficacy appears to vary depending on factors such as the complexity of the grammatical structure, the modality (written vs. aural), and learner processing limitations.

Some studies employed eye-tracking to evaluate how TE affects learner attention (Lee & Révész, 2020; Alsadoon & Heift, 2015; Simard et al., 2013). Lee and Révész (2020) conducted a study utilising eye-tracking to examine how learners notice enhanced input in written input. The study focused on learners' fixation durations and the number of fixations on target forms that had been typographically enhanced. Their findings indicated that learners tend to focus more on the enhanced elements, suggesting that TE directs attention to linguistic forms. However, the study also revealed that enhanced forms did not necessarily lead to better comprehension or acquisition, highlighting that attention alone may not be sufficient for learning to occur. Alsadoon and Heift (2015) also yielded same findings, showing that learners indeed spent more time focusing on enhanced forms. Simard et al.'s findings (2013) emphasized the complexity of learner engagement with enhanced text, as learners tended to notice the enhancements, but this did not consistently translate into improved grammatical accuracy or long-term retention. Simard's study, like the others, highlighted the importance of considering both the attention and cognitive processing demands when employing TE as a pedagogical tool.

A major similarity across these studies is the consistent finding that TE does succeed in drawing learners' visual attention to target linguistic forms. However, despite this increase in noticing, most studies noted that simply directing attention through enhancement does not necessarily lead to better acquisition of the grammatical structures (Winke, 2013). This points to a need for further research into the relationship between noticing and the successful acquisition of grammatical forms. Given the limited research examining the moderating roles of topic familiarity, nature of the target linguistic structures, and the specific types of TE, this review seeks to address this gap by providing an in-depth analysis of how these three factors influence the effectiveness of TE on grammar acquisition.

Given the inconsistent findings from previous studies, drawing a definitive conclusion about the impact of TE on L2 learners' form acquisition remains difficult. This uncertainty stems from variations in research design (e.g., different enhancement methods, control group compositions, types of TE, and treatment intensity) as well as significant differences among learners in terms of L2 proficiency, age of onset, and the exposure to the target

language outside the classrooms. Building on this premise, the current review aims to investigate how topic familiarity, nature of the target linguistic structures, and the type of enhancement influence the effectiveness of TE in acquiring target forms. In particular, the review will evaluate empirical studies that examine to what extent TE has an impact on L2 grammar acquisition and grammar acquisition, with an emphasis on the potential moderating roles of these three critical factors.

2. Possible Factors on the Efficacy of Textual Enhancement on L2 Grammar Acquisition

2.1. Topic Familiarity

The effectiveness of TE cannot be thoroughly evaluated without considering its influence on comprehension, as typographical enhancements assume that learners will acquire both meaning and grammatical structures (Han et al., 2008). However, many studies have neglected to measure comprehension, leaving the possibility that TE might adversely impact acquisition of meaning unclear. Additionally, topic familiarity—a potentially key element—has received limited attention from SLA researchers. As a result, empirical studies addressing this factor are relatively rare (Overstreet, 1998; Lesser, 2007; Lee, 2007; Combs, 2008), and the findings have been inconsistent. Nevertheless, considering topic familiarity as a possible moderating variable is justified for several reasons.

Incorporating culturally familiar topics in research could help expose the imbalance between how learners process meaning and form, offering researchers a pathway to explore whether familiar content increases TE's influence on acquiring both aspects. Unlike native speakers, L2 learners are required to split their attention between form and meaning when interacting with enhanced texts (Lee, 2007). As noted by Lee and Huang (2008) in their meta-analysis, VIE was found to slightly disrupt the processing of meaning, pointing to a potential conflict in how learners focus on both form and meaning. While a significant body of research has demonstrated TE's effectiveness in drawing attention to form (Issa et al., 2015; Lee & Révész, 2020), the question remains whether integrating familiar topics into enhanced texts might support better form acquisition. This hypothesis suggests that freeing up cognitive effort from meaning processing could allow learners to direct those resources toward acquiring form more effectively.

Lee (2007) conducted a quasi-experimental study to investigate the effects of TE and topic familiarity on Korean EFL students' ability to acquire the English passive voice and comprehend reading materials. The study was motivated by concerns regarding how to integrate grammar instruction within meaning-focused reading lessons, an issue stemming from earlier criticisms of form-oriented approaches. The study involved 259 high school students and explored how manipulating TE and topic familiarity impacted the learning of form and comprehension of meaning. Participants were divided into four groups: those with enhanced and familiar texts, enhanced and unfamiliar texts, baseline and familiar texts, and baseline and unfamiliar texts. They underwent three treatment sessions with reading materials that either contained enhanced grammatical forms or remained in baseline format. To ensure the groups were comparable, a reading proficiency test was conducted in the first session to assess the students' reading abilities, along with a form correction task to determine if there were any preexisting differences in grammatical knowledge between the groups. During the next two sessions, the students engaged in two treatments by reading the same articles, either in the baseline version or with TE, followed by group discussions with their peers. The study utilized form correction tasks to assess grammar acquisition and free-recall tasks to evaluate comprehension. The results revealed that TE significantly improved students' ability to acquire the target form, as shown in their form correction scores. Regarding the free-recall task, the groups that were exposed to texts with topic familiarity outperformed those who were not, and students who read the baseline version achieved higher scores than those who read the enhanced texts. These recall task results supported the hypothesis that topic familiarity positively influenced comprehension, while TE might have had a negative impact on meaning acquisition. Moreover, no significant correlation was found between form correction and comprehension scores among the groups exposed to enhanced texts, suggesting that form acquisition and meaning comprehension may operate independently.

Lee's (2007) research holds significance in several key areas. Firstly, the selection of tasks to measure both form acquisition and comprehension is grounded in robust theoretical and empirical frameworks, thereby enhancing the reliability of the study. The use of the form correction task is particularly noteworthy, as it minimizes the potential for random guessing by learners, a concern raised in prior studies (Wong, 2003). Additionally, the decision to utilize a free-recall task for measuring comprehension aligns with best practices in assessing learners' ability to recall information, as it mitigates potential biases from pre-formulated test questions (Overstreet, 2002). Secondly, the study's methodological rigor is commendable. Lee ensured that preliminary differences between groups were controlled through the administration of pretests for both form and meaning, thus strengthening the internal validity of the research.

Despite these strengths, the study had some limitations. One notable limitation was the relatively short duration of exposure to the enhanced target forms. Although Lee acknowledged the brevity of the exposure, the total time of 60 minutes was comparable to previous studies and may not have been sufficient to produce long-lasting effects. Furthermore, the study lacks a follow-up component to assess the retention of grammatical knowledge over time, which limits our understanding of the durability of the observed gains in form acquisition. Another limitation was

the absence of direct measures of attention. While the study hypothesized that TE would draw learners' attention to form and that attentional resources freed from comprehension could be redirected towards form acquisition, the study did not measure attention directly. This contrasts with Izumi's (2002) work, which demonstrated the positive effects of enhancement on noticing, even though it did not necessarily lead to acquisition. These limitations suggest that further research, particularly studies incorporating longer exposure periods and direct measures of attention, would be beneficial in confirming and extending Lee's findings.

Winke (2013) conducted a partial replication of Lee's (2007) study to address two key research questions: a) whether learners' visual attention could be drawn to targeted forms through TE, and b) what the effects of TE are on form acquisition and meaning comprehension. Winke made two important modifications to the original study. First, she introduced an external proficiency measure (the Dialang reading test) to ensure independent evaluation of learners' proficiency, addressing a gap identified in previous IE studies. Second, Winke employed eye-tracking technology to measure noticing more objectively, allowing for a direct assessment of whether enhancement successfully draws learners' attention to the target forms. The participants (n=55) had diverse L1 backgrounds, though the majority spoke Mandarin Chinese as their first language. As for the materials, Winke replicated the pre- and post-tests from Lee (2007) that focused on passive form correction. However, instead of using an inauthentic text, she selected a modified authentic news article, which contained numerous passive constructions, to assess the effects of enhancement. A free-recall task was used to evaluate reading comprehension. Participants completed the tasks individually, with monocular eye-tracking employed to track their visual attention, as it provided more precise measurements compared to binocular methods. After reading the texts, participants completed the free-recall task and the post-test.

The eye-tracking data was examined to address the first research question, which investigated whether TE influences noticing. Findings indicated that TE, to some extent, attracted learners' attention to the target structures, as reflected by longer rereading durations and more frequent revisits to the highlighted passive forms. Nevertheless, it did not significantly affect the initial processing of the forms, implying that although TE prompted noticing, it did not immediately translate into form acquisition. For the second research question, concerning the impact of TE on both form acquisition and comprehension, Winke analysed the gain scores and comprehension test scores between groups receiving enhanced versus unenhanced texts, using independent-samples t-tests. The results showed no statistically significant differences between the two groups, suggesting that TE neither enhanced nor hindered performance in terms of form acquisition and meaning processing. Participants exposed to enhanced texts did not perform significantly differently from those reading unenhanced texts on either form acquisition or comprehension tasks.

Winke's research had some limitations, particularly in its exclusion of topic familiarity as a variable. Unlike Lee, Winke did not explore whether participants were familiar with the content of the reading materials, leaving it unclear whether familiarity influenced the results. Additionally, the differences in the participants' numbers, L1 backgrounds, ages, and proficiency levels make it challenging to compare the two studies directly. Despite these limitations, Winke's study offers valuable insights into the relationship between noticing and form acquisition and raises important questions about the interaction between meaning and form processing in L2 learners. Her findings showed that while TE can promote noticing, it may not be sufficient on its own to lead to immediate acquisition, highlighting the need for further research in this area.

In addition to the two studies previously discussed, other research has shown that topic familiarity and IE can have different impacts on learners' understanding and form acquisition. Overstreet (1998) examined how TE and content familiarity influenced the acquisition of the Spanish preterit and imperfect tenses. The study involved 50 third-semester Spanish learners who had prior knowledge of the target grammatical forms. Two texts were selected for the treatment: the well-known story "Little Red Riding Hood" and an unfamiliar one, "Carta a Dios." In the enhanced condition, the preterit and imperfect forms were visually highlighted. Interestingly, learners in the unenhanced group outperformed the enhanced group in comprehension, and the TE did not seem to facilitate the acquisition of the grammatical forms. Based on this outcome, the researcher speculated that the enhancement may have shifted learners' attention away from meaning. However, given the participants' previous exposure to the forms and the short duration of the treatment, this interpretation might be slightly overstated.

To sum up, the analyses suggest that while topic familiarity can improve L2 learners' reading comprehension, it does not necessarily aid in the acquisition of specific linguistic forms.

2.2. *Nature of Target Linguistic Structures*

Della Putta (2016) investigated the impact of TE on the acquisition of two non-parallel grammatical features—Pre-possessive Determiner Article (PPDA) and Differential Object Marking (PA)—by Spanish-speaking learners of Italian (SSLI). These structures differ in terms of their learning challenges due to the typological relationship between Spanish and Italian. The study also examined the relative difficulty in learning (PPDA) and unlearning (PA) structures and the effects of TE on learners' accuracy and reaction times (RTs). The study involved 68 SSLI divided into two groups. Group A received texts enhanced for PA, while Group B received texts enhanced for PPDA. Both groups were tested using timed grammaticality judgment tests (GJT) before, shortly after, and two

months post-treatment. The goal was to assess accuracy and RTs as indicators of learning and processing difficulty. The study highlighted the differential challenge of learning PPDA versus unlearning PA. While learning PPDA was easier for SSLI, unlearning PA—due to the strong L1 transfer—proved significantly harder. The participants struggled to reject the L1-based PA structure, reflecting the deeper cognitive demands of inhibiting well-entrenched L1 rules. In terms of the efficacy of TE on L2 grammar acquisition, despite the theoretical potential of TE to increase learner attention to target forms, the study found no significant effects of TE on accuracy in GJTs for either structure. This was a critical finding, suggesting that TE alone might not be sufficient to induce restructuring of interlanguage representations in this context. TE did impact RTs, with treated groups showing longer RTs in most conditions, indicating more cognitive effort in processing enhanced structures. However, this increased attentional allocation did not necessarily translate to higher accuracy, highlighting a potential gap between noticing and learning. The study confirmed that unlearning L1 rules (PA) is more cognitively demanding than learning new L2 rules (PPDA). The participants showed greater difficulty in rejecting PA structures, which aligns with findings from previous research that inhibiting L1 interference requires more explicit instruction than TE can provide.

Jahan and Kormos (2015) conducted an experimental study to explore the impact of TE on EFL learners' noticing and grammatical awareness of the expression of future plans and intentions. Specifically, the study targeted two modal auxiliaries: *will* and *be going to*, which are often used to express future intentions in English. The study sought to examine how TE affected learners' metalinguistic awareness and grammatical development regarding these forms. The participants were 97 tertiary-level students in Bangladesh with a pre-test, immediate post-test, and delayed post-test design, conducted over five weeks.

Participants were divided into three groups: (1) a textually enhanced input group, (2) non-enhanced input group (input flood), and (3) a control group. The TE group was exposed to written texts where the target forms were made salient through boldface, increasing the perceptual salience of the modal auxiliaries. The non-enhanced group encountered the same texts without any enhancement, while the control group did not receive any form of input. The study used two carefully designed reading texts that included equal numbers of occurrences of the target forms. The texts were adapted to the learners' proficiency levels, and the target forms were incorporated into various communicative situations. Learners were tested using multiple-choice comprehension task, noticing questions, and metalinguistic awareness tasks. In addition, they completed grammar production and recognition tasks in the pre-test, post-test, and delayed post-test to assess how well they could use the target forms. As for the relationship between TE and noticing, the study found that TE positively influenced learners' noticing of the targeted future tense forms. A significant percentage of learners in the TE group reported noticing the forms in the enhanced texts, which was notably higher than in the non-enhanced group. However, despite the visual enhancement, a substantial portion of the TE group (21.6%) did not notice the forms at all, indicating that while TE can direct learners' attention to specific forms, it does not guarantee universal effectiveness across all learners.

The study also found that TE led to statistically significant gains in learners' metalinguistic awareness of “*be going to*”, but not “*will*.” Learners in the TE group were better able to articulate the use of “*be going to*” for future intentions made prior to the moment of speaking. However, they struggled with “*will*,” despite having higher pre-existing knowledge of this form, as indicated by the pre-test. These results highlight the challenges of expanding learners' understanding of the complex form-function mappings associated with modals in English. While “*be going to*” was more successfully learned, learners often misunderstood the volitional and pragmatic elements of “*will*”. The results suggest that TE was not sufficient to fully overcome learners' challenges in grasping the complexities of future tense modal usage. The learners' L1 expresses future tense through a single future morpheme, which contrasts sharply with English, where multiple forms are used depending on the context and intended meaning. This significant cross-linguistic difference likely contributed to the difficulties in acquiring the nuances of “*will*” and “*be going to*.”

In terms of grammatical development, the study found that TE positively affected learners' grammatical development, particularly with the use of “*will*.” Learners in the TE group demonstrated improved performance in both production and recognition tasks for “*will*” in the immediate and delayed post-tests. In contrast, although learners showed increased metalinguistic awareness of “*be going to*”, their performance in production and recognition tasks did not improve to the same extent. The study noted that this discrepancy might be attributed to the learners' low pre-existing knowledge of “*be going to*,” which may have prevented them from fully benefiting from the implicit focus on form provided by TE. The results align with previous findings in the literature that show that TE is often less effective when learners have low prior knowledge of the targeted forms. Learners who had some prior knowledge of “*will*” were able to improve their use of this form, while learners with less familiarity with “*be going to*” struggled to apply it accurately in the tasks. The study by Jahan and Kormos (2015) contributes important insights into the efficacy of TE in promoting grammatical awareness and development in EFL learners. While TE was found to be effective in enhancing learners' noticing and use of “*will*” for expressing future intentions, its impact on “*be going to*” was less clear. The results highlight the importance of learners' prior knowledge and the complexity of the target structure in determining the success of TE. Learners with higher pre-existing knowledge of “*will*” benefited more from TE, while those with lower familiarity with “*be going to*” struggled to apply the form accurately, despite increased awareness.

Meguro (2017) investigated the effects of TE on grammar learning (specifically, tag questions) and reading comprehension among Japanese senior high school students. The study focuses on three different types of tag questions: auxiliary (AUX), do-support (DO), and modal (MODAL) tag questions. The primary aim was to determine whether TE would lead to improved acquisition of these grammatical structures and whether different types of tag questions would differentially affect learning outcomes. The study used a pretest–posttest design with three treatment sessions. Participants included 69 Japanese high school students who were divided into three experimental groups ($n = 52$) and a control group ($n = 17$). The experimental groups received passages containing one of the target forms visually enhanced through bolding and an increase in font size. The control group received unenhanced passages. The participants were assessed using a multiple-choice grammar task to test their knowledge of tag questions. The study employed a three-week interval between the sessions to gauge both immediate and slightly delayed effects.

The results revealed mixed outcomes regarding the impact of TE on grammar learning. One of the enhanced groups, showed significant improvement in the acquisition of do-support and modal tag questions. This group received the enhanced input in a sequence of easy to hard (MODAL > AUX > DO), and this sequencing seemed to facilitate better generalization and learning of the rules. However, Groups 1 and 2, which received enhanced input in randomized sequences, did not show significant gains. These findings suggest that sequencing of input may play a critical role in the effectiveness of TE, particularly when learning more complex grammatical structures like do-support tag questions. The control group, which received unenhanced input, showed learning gains comparable to those of the experimental groups, suggesting that repeated exposure was also beneficial for acquiring tag questions.

The study demonstrated that TE could enhance the learning of certain grammatical structures (such as modal and do-support tag questions), but the effectiveness of TE depends heavily on how the input is sequenced and on the complexity of the target structure. The sequencing of input seems to be a key factor in whether TE will successfully lead to L2 development. The study suggests that arranging input in an easy-to-hard sequence may promote better generalization of L2 rules, particularly for more complex grammatical items like do-support tag questions. Additionally, the study highlights the potential limitations of TE for more syntactically complex structures. While TE can direct learners' attention to form, it may not be enough to foster deeper processing unless the input is carefully structured to support rule generalization. This finding aligns with the notion that noticing alone, which TE facilitates, may not be sufficient for full acquisition without additional cognitive processing.

Differ from the aforementioned studies, Lee and Révész (2020) investigated how different forms of captioning, both textually enhanced and unenhanced, impacted L2 learners' grammatical development, focusing on the English present perfect versus past simple forms in the context of news reporting. This study addressed gaps in previous research on multimodal input-based tasks and the role of TE in promoting the acquisition of grammatical features. The researchers used eye-tracking methodology to explore how attention allocated to captioned input could influence the learning of the target grammatical constructions. The study adopted a pretest–posttest–delayed posttest experimental design with 72 Korean university students, all of whom were advanced learners of English. The participants were divided into three groups: (1) no captions, (2) unenhanced captions, and (3) enhanced captions. The enhanced captions group saw the target forms highlighted in a different colour to increase perceptual salience. The participants watched a series of news clips and completed a variety of tasks, including oral and written production tests and fill-in-the-blank tests, to assess their development in the target grammatical structures. Their eye movements were tracked throughout the treatment phase to measure their attentional focus.

The study revealed the use of enhanced captions significantly promoted learners' development in the use of present perfect as measured by both immediate and delayed post-tests across all assessment tasks. The enhanced captions group demonstrated significant improvement in their use of present perfect, outperforming both the unenhanced and no captions groups. The unenhanced captions group also made language gains, particularly on the written production task, but the no captions group showed minimal development. In contrast, no significant improvements were observed in any group's performance with the past simple, which may be due to a ceiling effect—participants already had high proficiency in past simple, so there was little room for improvement.

Eye-tracking data showed that learners in the enhanced captions group spent significantly more time focusing on the target forms (present perfect) compared to the unenhanced captions group. The enhanced captions group also exhibited more second-pass reading and revisits to the target forms, indicating a deeper level of processing. This suggests that TE was effective in drawing learners' attention to the target constructions and encouraging a more detailed analysis of these grammatical features. The results suggest that TE in captions can be a powerful tool for promoting L2 learners' grammatical development, especially for structures that are more challenging. The study supports the idea that increasing the salience of target forms helps direct learners' attention toward those forms, which can lead to greater learning outcomes. The use of eye-tracking methodology provided valuable insights into the attentional processes underlying L2 learning and demonstrated the importance of attention in the acquisition of grammatical knowledge. However, the lack of significant improvement in past simple suggested that the effectiveness of TE may depend on the learner's prior knowledge and the complexity of the target structure. Since the participants were already proficient in past simple, the TE did not provide much

additional benefit, as their performance was already close to ceiling levels. Additionally, the study highlighted the potential limitations of implicit learning techniques like TE. While TE successfully captured learners' attention, it may be insufficient for promoting deeper understanding or automatization of grammatical knowledge without additional explicit instruction.

The relationship between TE and the nature of the target linguistic structures varies depending on the complexity of the structures involved. Across the studies by Della Putta (2016), Jahan & Kormos (2015), Lee & Révész (2020), and Meguro (2017), a consistent finding emerges: TE tends to be more effective for the acquisition of simpler, easy-to-learn structures compared to more complex, rule-governed structures. For example, in Della Putta's (2016) study, the relatively simpler Pre-possessive Determiner Article (PPDA) was more easily acquired than the more complex Differential Object Marking (PA), with TE having limited success in facilitating the unlearning of entrenched L1 patterns like PA. Similarly, Jahan and Kormos (2015) found that learners improved more in their use of the simple future tense form "will" than in their understanding and use of the more complex "be going to." Lee and Révész (2020) demonstrated that TE was particularly effective for the acquisition of the present perfect, which is complex but rule-governed, but had less impact on the simpler past simple, where learners had already reached a ceiling effect. However, in Lee and Révész's (2020) study, high proficiency level of the participants (C1 or above) and their prior exposure to the target form might have contributed to their ability to acquire this relatively complex structure despite its challenges. This suggests that while TE can be effective for complex structures, its success may be mediated by the learners' proficiency level and prior familiarity with the forms, indicating that TE alone may not account for the observed gains. Meguro's (2017) study further supports these findings, showing that TE was more beneficial for simpler modal tag questions but struggled to facilitate learning of the more complex do-support tag questions, which require additional syntactic processing. Across these studies, it is evident that while TE can enhance the salience of target forms, its effectiveness is moderated by the inherent complexity of the linguistic structures, with simpler structures generally benefiting more from enhanced input than more complex, rule-laden ones. This suggests that TE alone may be insufficient for the acquisition of more challenging linguistic forms, which may require additional explicit instructional support to promote deeper processing and long-term acquisition.

2.3. *The Impact of Typographical Cues*

There has been limited research on the impact of different types of TE on L2 grammar acquisition, as much of the earlier work has focused on its effects on L1 test performance, retention, and comprehension (LaBrozzi, 2014).

Simard (2009) investigated the differential effects of various TE formats on the intake of plural markers in English among French-speaking secondary students. The study's primary objective is to examine whether the number and type of typographical cues (e.g., bold, italics, capital letters, underlining, colour) have a differential impact on learners' intake of English plural markers. This is one of the few studies that directly compares different TE formats, providing insights into how various typographical cues influence the processing and acquisition of specific grammatical structures. The study employed a split-plot experimental design with eight groups (seven experimental groups and one control group). A total of 188 French-speaking secondary students were exposed to various TE conditions involving different typographical cues. The target grammatical structures were four plural markers in English: -ves, -ies, -ches, and -oes. Each experimental group received the same text but with different typographical enhancements, such as bold, italics, capital letters, colour, underlining, or combinations of multiple cues (e.g., three or five cues used together). The control group received the same text without any enhancements. Learners were assessed on their intake of these plural markers using a multiple-choice recognition task and an information transfer task.

The study found significant differences in the effectiveness of different TE formats. Capital letters and a combination of three cues (bold, capital, and underlined) led to the highest intake scores, significantly outperforming other groups, including the control group. This suggests that certain typographical cues, particularly capital letters and combinations of cues, are more effective at drawing learners' attention to grammatical forms. However, the use of five cues seemed to have a saturating effect, reducing the effectiveness of TE. This indicates that while a combination of cues can be beneficial, too many cues may inhibit learners' ability to process the target forms effectively. The study also highlights the differential effects of single vs. multiple cues. Single cues (such as bold or italics) did not produce significantly better results than the control group, suggesting that a single typographical cue may not be sufficient to enhance intake effectively. In contrast, the 3-cue combination produced significantly better results than both single-cue and 5-cue groups, suggesting that a moderate level of cueing is optimal for drawing attention without overwhelming the learner. However, the study acknowledged certain limitations, such as the lack of oral protocols to measure learners' on-the-spot attention and noticing. Moreover, both the multiple-choice and information transfer tasks are unable to fully prevent learners from guessing the correct answer or sequence, making it difficult to accurately assess L2 learners' acquisition of form and meaning.

LaBrozzi (2014) investigated the effects of different types of (TE) on L2 learners' form recognition and TE reading comprehension, focusing on the Spanish preterit and present tenses. The study examined the impact of six TE types—underlining, italics, bold, capital letters, font size increase, and font change—on learners' ability to recognize grammatical forms without hindering their reading comprehension. The study involved 125 adult

learners divided into seven experimental groups and one control group. Each group received a text with one type of TE applied to Spanish verbs. The control group received no enhancement. Participants completed translation tasks and a multiple-choice comprehension test before and after reading the enhanced texts to assess form recognition and comprehension.

The results indicated that font size increase was the most effective type of TE in facilitating form recognition. Participants in the font size increase group significantly outperformed both the control group and the capital letters group on post-test translation tasks. This finding suggests that increasing the font size may have made the enhanced morphemes more salient, drawing the learners' attention to the specific morphological changes in the verb forms. Interestingly, capital letters, which were expected to be highly salient, did not produce significant learning gains, indicating that certain enhancement types may not always lead to better form recognition. The study also revealed that other types of TE, such as underlining, italics, and boldface, did not yield significant differences in form recognition compared to the control group. This finding aligns with previous studies that show that more subtle forms of enhancement may go unnoticed by learners when they are reading for meaning. Font changes, while perceptually salient, did not appear to have a noticeable effect on form recognition, likely because the changes were too subtle to attract consistent attention from the learners.

Additionally, LaBrozzi's findings reinforce the idea that TE does not inherently interfere with reading comprehension, supporting its use in instructional texts where both form and meaning must be processed simultaneously. This is particularly relevant for language teachers designing materials that seek to balance focus on form with comprehension of meaning. The study also sheds light on the moderating effect of prior knowledge, suggesting that TE may be more effective when learners already have some familiarity with the target forms, allowing them to use their existing knowledge as a foundation for recognizing and internalizing enhanced forms.

LaBrozzi's (2014) study made an important contribution to the literature on TE, offering new insights into the effectiveness of various enhancement types. By isolating individual enhancement techniques, the study provided clear evidence that font size increases can significantly improve learners' ability to recognize grammatical forms without hindering their comprehension of the text. However, this study is not without its limitations. First, the multiple-choice task may have allowed for some degree of random guessing by learners, which could reduce the reliability of the results. Second, there was an overlap between form recognition and meaning comprehension assessments in both the translation and multiple-choice tasks, potentially leading to inaccurate measurements of noticing and acquisition. To clarify, in the translation task, learners needed to grasp both tense and meaning to succeed, while the other task presented 20 items focused on the acquisition of the present and preterit tenses. Although the scores were recorded separately, the results of these tasks may not accurately reflect the specific effects of TE on form acquisition and meaning comprehension.

The studies by Simard (2009) and LaBrozzi (2014) highlighted the differential effects of typographical cues on L2 grammar acquisition. Simard (2009) found that capital letters and combinations of multiple cues (e.g., bold, underlined, capitalized) led to better form recognition of English plural markers, with evidence of a saturation effect when too many cues were used simultaneously. In contrast, LaBrozzi (2014) showed that font size increase was the most effective cue for improving form recognition of Spanish verb tenses, outperforming other enhancements, which had little impact. Both studies revealed that while typographical cues could facilitate noticing, their effectiveness varied depending on the cue type and how learners engage with them, with simplicity and salience often proving more effective than more complex or subtle cues.

3. Conclusion

This review paper aims to address two key research questions: (1) Is TE effective in promoting L2 learners' grammar acquisition? (2) How do the learning outcomes vary depending on three possible moderating factors (topic familiarity, nature of target linguistic structures, and the specific types of TE used)?

As for the first research question, this review showed that TE is effective in drawing learners' attention to grammatical forms but does not consistently lead to grammar acquisition across different contexts. Moreover, the number of empirical studies on the effectiveness of TE is not sufficient enough to give a clear answer to the first research question. It is challenging to identify the specific influence of TE by itself, as evaluating form acquisition through tasks is not equal to assessing the effects of IE. This is due to the numerous covarying factors, including variations in research methodologies, participants' age, differences in outcome measures, and proficiency levels in participants' both L1 and L2.

As for the role of topic familiarity in TE on the acquisition of L2 grammar, the findings from Lee (2007) and Winke (2013) suggested that while topic familiarity has a mediating role in improving comprehension, its impact on grammar acquisition, particularly in combination with TE, remains less certain. Lee's study showed that familiar topics can ease cognitive load, allowing learners to better comprehend reading material, but this benefit does not extend to grammar acquisition, where topic familiarity alone seems insufficient. On the other hand, Winke (2013) presented a more complex interaction between TE and topic familiarity, suggesting that when combined, these factors might create a more conducive environment for learners to notice grammatical forms

without compromising comprehension, though the effects are inconsistent and not always statistically significant. The differing results of these studies highlight the nuanced relationship between TE, topic familiarity, and grammar acquisition. TE seems to facilitate learners' attention to form, yet this focus on form often detracts from overall comprehension, especially when the topic is unfamiliar. Meanwhile, familiar topics may help learners engage more deeply with content, but they do not always help with noticing or learning grammatical forms unless paired with TE. This indicates that the effectiveness of TE on L2 grammar acquisition may not rely solely on the nature of the enhancement or the familiarity of the topic but on how these factors interact to balance form-focused instruction with meaning comprehension.

Given the limited number of empirical studies and the mixed outcomes, it remains difficult to draw definitive conclusions about the role of topic familiarity in enhancing grammar acquisition through TE. More research is needed to explore how different types of familiar topics and varied TE techniques might interact in different learning contexts to optimize both form learning and meaning comprehension. The existing studies suggest that while topic familiarity can support comprehension, its benefits for grammar acquisition are contingent on a range of additional factors, including the type of TE used and the complexity of the target structures.

As for the mediating role of the nature of target linguistic forms, the empirical studies investigating the efficacy of TE on the acquisition of L2 grammatical forms differing in terms of complexity and saliency suggest that the effectiveness of TE depends heavily on the nature of the target linguistic structure. Simpler or less embedded structures, such as modal tag questions in Meguro (2007), are more likely to benefit from TE. This may be because such structures are easier to notice and process due to their relatively straightforward syntactic requirements. In contrast, more complex structures that require multiple layers of syntactic or morphological manipulation, were not as easily acquired through TE alone. This underscores a potential limitation of TE, particularly when the target L2 form involves deeper cognitive processing or intricate rule application. Additionally, Della Putta (2016) provided further insight by showing that TE may not provide sufficient cognitive support for the difficulty in restructuring or inhibiting the use of L1 transfer. This highlights that TE, while useful for drawing attention to salient forms, may need to be supplemented with more explicit forms of instruction, particularly when learners are expected to overcome L1 interference or when the target form requires unlearning or reconfiguring prior knowledge.

Simard (2009) and LaBrozzi (2014) investigated the effects of multiple typographical cues in promoting L2 grammar acquisition. Both studies revealed that TE can effectively draw learners' attention to L2 forms, particularly when visually salient cues such as bolding or capitalization are used. However, the extent to which TE is beneficial depends on the learner population and the number of TE used. While bolding and capitalization are effective across different learner groups, excessive use of TE (multiple cues used simultaneously) can create cognitive overload, preventing learners from effectively processing the enhanced forms.

Despite the inconclusive findings, this review underscores the necessity of exploring the effects of TE on both grammar acquisition and comprehension, advocating for more refined research methodologies that incorporate detailed, online measurements of noticing and its connection to L2 grammar acquisition. Furthermore, this review highlights that the role of key moderating factors, such as topic familiarity and the complexity of target linguistic structures, has been underexplored due to inherent challenges in research design and the limited number of empirical studies addressing these variables. This paper seeks to contribute to the ongoing discourse by providing insights into both the measurement of TE effects and the practical application of this technique in language classrooms. It is anticipated that continued integration of teaching practices will offer valuable feedback to inform future research, ultimately enhancing our understanding of the impact of TE in second language acquisition.

Based on the findings reviewed in this paper, the pedagogical implications of TE suggest that while TE can effectively draw learners' attention to target forms, its efficacy is influenced by several moderating factors. Educators should consider utilizing TE as a complementary tool in form-focused instruction, especially for simpler, more accessible grammatical structures where TE has shown to be most effective. Teachers may need to carefully select the type and intensity of TE cues. Furthermore, integrating familiar topics with TE may enhance learners' ability to balance attention between meaning and form, ultimately improving their overall acquisition of grammatical structures. The findings also imply that while TE can facilitate noticing, it may not be sufficient on its own for more complex structures, which may require additional explicit instruction or sequencing of input to promote deeper learning. These insights encourage educators to tailor the use of TE to their learners' proficiency levels and the specific linguistic goals of their lessons, ensuring a balanced approach to grammar instruction that supports both form recognition and meaning comprehension.

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