# Input Enhancement Techniques: A Critical Summary of the Literature

Thomas Stringer

## Abstract

本論文では、第二言語習得（SLA）研究において、インプット強化法（IET）として知られている教育的介入法に関する文献の現状について客観的に考察する。SLA における IET の効果については、議論の余地がある。まず、2種類の IET であるテキスト強化（TE）およびインプットフラッド（IF）のインプットの役割を検討する。次に、SLA 分野で重要な3つの論文である Hernandez（2011）、Lee & Huang（2008）および Winke（2013）を調査し分析を行う。その後、気付き事項をまとめ、他の研究との関連性について考え、最終的な結論をまとめる。SLA におけるインプットの処理については、まだ理解されていないことが多く、本論文に示す考察からは、TE や IF などの IET に継続的な効果があるかどうかは明確ではない。限られた数の論文が調査対象であることを考慮すると、SLA の他の範疇で IET を適用するには更に研究が必要となるであろう。

### Keywords

SLA, Input Enhancement Techniques, Input Flood, Textual Enhancement

### Dedication

This paper is dedicated to Professor Koji Nakamura. I want to take this opportunity to deeply thank Professor Nakamura for his unfailing kindness, good humour, hard work and support. His enthusiastic passion for his profession serves as a constant example, and I continue to be envious of his apparently boundless energy. I sincerely wish him a very long, happy and fulfilling retirement, and many more visits to the U.K., his second home.

## 1. Introduction

Today a key issue for Second Language Acquisition (SLA) researchers is optimizing input-based implicit pedagogical interventions, so called Input Enhancement Techniques (IETs). The situation is exacerbated by on-going

disagreement as to the exact nature of the processes underlying learner input processing (Lee & Huang, 2008; Schmidt, 1990, 1995; VanPatten, 2002). In this context, the efficacy and relative merits of implicit and explicit interventions remains open for debate (DeKeyser, 1995). Can implicit intervention bring about effective changes in the interlanguage of L2 learners (Alanen, 1995; Leow, 2001; Mackey & Philp, 1998)? The literature on two such IETs: Textual Enhancement (Trahey & White, 1993) or TE, and Input Flood (Sharwood, 1993), IF, is particularly worthy of scrutiny. Coming to prominence in the 1990's and early 2000's, they remain controversial. VanPatten's Processing Instruction (VanPatten, 1996, 2002, 2004), PI, similarly attempts to manipulate input to increase saliency and noticing. However, PI is strongly empirically supported (Wong, 2004) as compared to TE and IF (Alanen, 1995; Lee & Huang, 2008; Leow, 2001, 2008). The efficacy of either technique for learner's noticing the target form (Sharwood Smith, 1993) or its' meaning (Lee, 2007; Simard & Wong, 2001) may be highly variable-dependent (Park, 2005). On the other hand, many studies have found the techniques to have positive benefits (Han, 2008; Trahey & White, 1998; Williams & Evans, 1998). Yet others like Izumi (2002) claim there is no evidence to suggest that either approach promotes acquisition when compared to more explicit methods of instruction. It is clear that there is much scope for reviewing the state of the literature. This critical summary aims to bring some clarity to the discussion through a critical summary of the state of the IET literature. However, it is first prudent to illustrate the background to the debate on input and IETs in SLA.

## 2. Conceptual Overview

### 2.1 The Role of Input

Input, or samples of language that learners are exposed to in a communicative context or setting (Wong, 2005), has been seen as key to successful SLA since Krashen (1985) debuted the Input Hypothesis. In the early 1990's Sharwood Smith (1993) suggested that the role input plays in SLA could be expanded with implicit 'Input Enhancement Techniques' (IETs). The enhancement of input refers to strategies used by educators to underscore some particular target linguistic feature. Theoretically, by making the target forms more easily noticeable to an L2 learner, greater acquisition is promoted. They are described as implicit because the target features are not directly or explicitly addressed.

Since Long (1983, 1991) debuted the idea that L2 grammar instruction needed

radical rethinking in terms of a Focus on Form (FonF), communicative syllabuses based on his ideas have become common (Nassaji and Fotos, 2004). In such syllabuses, implicit, input based pedagogical interventions are used to promote acquisition of target forms during meaning based activities. IETs are one form such interventions can take, and attempt to draw learners' attention unobtrusively to target forms so that acquisition effectively occurs by reshaping the input learners receive (Izumi, 2002). IETs run the gamut from practices such as modulating the speed, stresses or difficulty of language with which one speaks to L2 learners, to the greater use of gestures and other non verbal practices like Textual Enhancement (TE) (Trahey & White, 1993) or Input Flood (IF) (Sharwood, 1993).

Contrary to explicit approaches in which output is the focus of attempts to develop interlanguage, implicit input focussed approaches manipulate what learners are exposed to achieve the same end. Arguably, Schmidt (1993; 1995) is the first place to turn. His Noticing Hypothesis states that before learners can acquire target language that they must notice it. Noticing refers to awareness that some new information is being presented (Ortega, 2009). Although argument continues as to whether this noticing occurs consciously or unconsciously (Ellis, 1997; Krashen 1982; Truscott, 1998) there is general consensus on the importance of promoting noticing in SLA (Simard & Wong, 2001) by increasing saliency. This is where implicit IETs like IF and TE come into play. They focus learner's awareness of target linguistic structures through manipulation of the input to which learners are exposed.

## 2.2 Input Flood and Textual Enhancement.

Briefly stated, IF means saturating examples of language with the desired target form. By increasing the frequency with which learners encounter a form, it is supposed that IF makes it more likely learners will notice and absorb it. Instructors may either select authentic materials or design the materials so as to 'flood' them with the target form. It solely focuses on increasing incidence of the target form (Wagner-Gough & Hatch, 1975). As Gass (1997) notes, learners are supposed to both understand the meaning and acquire the form itself this way. Conversely, Textual Enhancement uses typographical techniques like boldfacing, italicising or changing the colour of text to increase salience and promote noticing. As Nassaji & Fotos (2011) point out, TE involves highlighting one linguistic feature- the

focus of the lesson. Similarly to IF, rule explanation is not given. Let us briefly examine the strengths of both techniques.

**2.2.1 Input Flood.** White (1998) claimed that IF not only enforces noticing whilst activating learners' problem solving skills, but that it promotes greater intake. Intake refers to "that part of the input that the learner notices" (Schmidt, 1990, pp.139). In this context, White is claiming that IF helps learners to notice, acquire and replicate a target form. Some have emphasised caution of IF, emphasising an inversely proportional relationship between form processing and comprehension (VanPatten, 1996), as learners are predisposed to process meaning before form. Yet others like Lee (2007) suggest that IF actually improves comprehension due to it's repetition of the target form, allowing the learner to gain a greater grasp on the meaning.

   Wong (2005) states that as an implicit technique involving no direct rule explanation, learners may simply not understand the relevance of the increased instances of the form without the use of other pedagogical interventions, nor may they be equipped to make the leap from intake to grammatically correct output. That is to say, as a technique, it is too implicit to be useful.

**2.2.2 Textual Enhancement.** TE proponents suggest it increases noticing more than IF, or even more than explicit rule explanation (Alanen, 1995) and that as such it has dramatic benefits (Berent and Kelly, 2008). Sharwood Smith (1993) accords it a key, skills development role due to the highlighting of the target features. He notes that careful selection of highlighting techniques and appropriate source materials can further enhance its efficacy. Izumi (2002), Ellis (1997) and others like Han (2008) support Sharwood's claims that TE has a positive impact on salience and noticing, but dispute its lasting impact on output. Others like Leow (2001, 2007) claim that TE has almost no impact on noticing or on output.

Now we can turn to our critical review of the IET literature. I will summarize two empirical studies and one meta-analysis; Hernandez, 2011, Lee & Huang, 2008, and Winke, 2013. Finally, I intend to present a critical summary of these papers and the implications for future IET research.

## 3. Literature Review

Both TE and IF have been written about more and more in the past two decades (Winke, 2013). This critical summary examines three such studies: Hernandez's 2011 paper comparing IF and Explicit Instruction (EI), Lee & Huang's 2008 meta-analysis of TE studies, and Winke's 2013 comparative study of TE and IF. Hernandez's paper provides direct comparative data for implicit and explicit, techniques. Lee & Huang's paper is broad in its scope of data collection and statistical analysis of TE, acquisition and comprehension. Winke's paper was chosen as a partial reinvestigation of Lee (2007), which directly compared TE and IF. That paper found that TE positively affects form at the expense of comprehension, mirroring VanPatten's (2002) ideas about attentional resources. However, Winke takes the research in a new direction, focusing on noticing. She investigates how the human eye tracks textually enhanced words in IF texts to try to understand whether TE and IF affect noticing. Winke then goes on to examine whether noticing translates into measurable benefits in terms of acquisition, and whether there is a negative correlation between drawing learners' attention to form through IETs and their comprehension. Each paper looks at issues surrounding IF and TE from different angles, and provides an interesting and well-rounded basis for an examination of the literature.

### 3.1. Hernandez, 2011 "*Re-examining the role of explicit instruction and input flood on the acquisition of Spanish discourse markers*."

**3.1.1 Overview.** Todd Hernandez attempted to develop earlier work he had done on IF (Hernandez, 2008) by directly comparing it to Explicit Instruction (EI). Hernandez proposed to compare a group exposed to EI and IF against a group only exposed to IF. By doing so he hoped to ascertain which approach had a greater impact on acquisition. Secondly, he hoped to find out exactly how the groups differed in their communicative output after exposure.

**3.1.2 Methodology**. 91 native English speaking adult college students studying Spanish were tested on their ability to use discourse markers to talk about past events. Hernandez, citing de la Fuente (2009), VanPatten (1985, 2004) and Andersen (1990), notes that discourse markers were selected for several reasons. First, they are frequently overlooked in educational materials. Second, they often go unnoticed by learners because of their low salience. Learners are prone to using

other forms to create meaning, and thus don't notice discourse markers. Third, discourse markers have many different context dependent applications and meanings. Fourth, they can occur in several sentential positions, not all of which are equally noticeable by leaners. These combined make discourse markers difficult for second language learners to acquire. Of 91 participants, 36 were in the El + IF group, 30 to the IF group, and 25 to the control group. An oral pre-test, immediate post-test, and delayed post-test were administered. One teacher taught both groups, over two 50-minute classes in one week. Both groups began with a review of the preterite and imperfect tenses.

The El + IF group was given EI on the use of discourse markers in the past tense. They were also exposed to IF of the target form. As part of their EI the participants reviewed the target forms and were given handouts describing how discourse markers function. Their IF treatment consisted of three texts whose content had been manipulated to include more discourse markers. They were asked to identify discourse markers, and answer comprehension questions. The participants were given the opportunity to practice using discourse markers with three information gap picture description exercises while receiving corrective feedback. Finally, participants were asked to identify all instances of discourse markers in two written exercises.

The IF group was given no explicit explanation of discourse markers, and was only subjected to IF. Participants didn't receive instruction on their function, although they received the same IF. The IF group then completed all the same activities as the EI+IF group, however during the teacher's corrective feedback explicit attention was not drawn to discourse markers.

**3.1.3 Results.** The results of the pre, and posttests revealed that both the EI+IF group and the IF group experienced positive benefits, as well as when both groups' performance was compared to a control group. EI added little qualitatively to IF, and vice versa, although each approach was efficacious in and of itself. Neither approach was clearly superior to the other. Although the EI+IF group outperformed the IF group in classroom communicative exchanges, these gains were not reflected in the posttest. Hernandez notes that these results contradict those of several other studies that demonstrate the effectiveness of EI over that of IF (Alanen, 1995; Hernandez 2008; de la Fuente 2009).

**3.1.4 Analysis.** Hernandez' findings seem to cautiously indicate that with the right supportive exercises and feedback that IF is at least as effective as TE at promoting acquisition. The study design itself is sound in its selection of activities, testing regimen, and group selection parameters, which limit the amount of variables.

A number of important caveats should be noted. There are significant structural factors of the study that might have colored its results. The period of instruction was quite short, and the sample size is small with only around 30 in each group. The age range is also narrow. It would be interesting to see whether these results are replicable across groups of different sizes, ages and abilities. We can't tell from the study how much learner development affected the results. The study included quite a high frequency of exposure to the target form in the IF sections. As per the Frequency Hypothesis (Gass, 1997), the higher amount of exposure to the targeted forms in the IF group might have induced better noticing. Again, we cannot tell whether these results would be replicable with texts of different lengths. Hernandez' limited results don't preclude the possibility that IF is only effective under certain conditions. Lastly, the EI+IF group was also being directed to focus on discourse markers in addition to the preterite and imperfect tenses. This could have decreased their ability to notice the target form.

We should take these factors into consideration, and they should temper attempts to draw bold conclusions. The effectiveness of IF seems highly dependent on variables such as which particular form is being targeted, prior knowledge of the form, the difficulty level or length of the text in which the flood appears and so on. Conversely, there is evidence against the claim that IF draws focus away from meaning. Therefore I think we can say that Hernandez does provide us with some tentatively supportive evidence. IF can be a useful technique in the armory of any educator, to be used in concert with others.

**3.2. Lee & Huang, 2008** "*Visual Input Enhancement and Grammar Learning, A Meta-Analytic Review*"
**3.2.1 Overview.** The authors synthesize 16 separate studies on TE. Their meta-analysis examines whether TE is beneficial to acquisition and damaging to comprehension. They also wanted to measure the effect of TE on noticing. According to their criteria, since 1991 only 16 eligible studies had been published

which investigated the pedagogical impact of IETs, or as they term them VIEs - Visual Enhancement Techniques. Conducting a meta-analysis provides Lee & Huang with a chance to aggregate as large a field of data as possible, and to widen the sphere of inquiry.

**3.2.2. Methodology.** Lee and Huang selected papers with descriptive statistical data from a focus on texts containing either one or two target grammatical forms, differing from study to study. The studies ranged in length from 1 day to 4 weeks, each comprising up to 10 treatment sessions, and were conducted with L2 learners of Spanish, English, Finnish, French and Japanese. Boldfacing, italicization and underlining were used in different combinations across the 16 studies.The meta-analysis looked at data from 1257 participants, with sample sizes ranging from 10 to 256 and a mean sample size of 62.95 people. Lee & Huang found most studies used intermediate level learners, most of whom had no previous exposure to the target form. The readings used in the studies went from a few hundred words to several thousand- allowing for wide variation in the number of instances of the target form.

Across all 16 studies pretests and posttests were used, comprising a total of 22 methods of testing acquisition ranging from sentence completion to picture description. 9 of the 16 studies also involved meaning comprehension testing, and 3 of the 16 studies attempted to measure the impact on noticing. In order to compare the magnitude of the effect between studies, Lee and Huang contrasted the mean scores of the experimental and control groups on the pre and posttests.

**3.2.3 Results.** The meta-analysis showed that when comparing pre and posttest results, TE did have a positive impact on grammar learning, but one that was small enough to be "not statistically trustworthy…negligible" (Lee & Huang, 2008, pp.321). The authors speculate that the wildly differing results produced by the 16 studies causes this. The general trends also suggested a negative impact on participants' meaning processing, as predicted by VanPatten (2002) who suggests that there is an inversely proportional relationship between form and meaning processing. Due to the small sample size, the authors were unable to produce a definitive analysis of the effects of TE on noticing.

**3.2.4 Analysis.** This paper has a lot to recommend it. Firstly, it is almost

unparalleled in scope. There is no other meta-analysis of TE more comprehensive than Lee & Huang's. However, it is clear that such little research has been done on this topic that any conclusions drawn must be stated tentatively. Second, all of the analysis was founded on strict criteria used to choose the studies:  all 16 used a comparison group, came from a set time period (1981-2006), were published in peer-reviewed journals, books or unpublished dissertations, and were large enough to be statistically relevant. Third, Lee & Huang's methods for data analysis were based on a standardizing system that helped them compare common characteristics, allowing accurate statistical analysis. The system broadly focused on learner characteristic and study design. Some examples of the learner characteristics selected were sample size, previous knowledge or length of study and the learning context. Some of the design characteristics selected were target language and form, the magnitude of the processing demands the testing procedures placed on the participants, various different testing procedures used and other factors such as the length of the study. The use of this standardizing system ensured the accuracy of their results as much as was possible and prevented skewing of data.

Naturally there are a few areas in which the analysis is lacking. The 16 studies used in the analysis are few in number and were often incomplete. This should be improved if the analysis were replicated. Some studies were missing key bits of information or did not directly address Lee & Huang's research. As noted by the authors, differences in factors like target structure and sample size are an important moderating variable- no matter how rigorous the standardizing procedures. Ideally, these variables would be controlled were the original studies replicated.

Lee & Huang designed a thorough analysis providing an overview of the data available on TE, acquisition and comprehension. The meta-analysis was unable to shed such light on the impact on noticing. If we are to trust their results, then we must conclude that TE has a slight positive impact on acquisition, and a marginally negative impact on meaning processing. Interestingly, the comparison groups 15 of the 16 studies were exposed to IF. However, as previously noted the orders of magnitude by which TE was more effective than the IF were statistically non significant. For the purposes of this literature review it is useful to conclude that IF and TE are equally as effective as each other at promoting acquisition. That

said, based on the inconclusive data presented here, no definitive claims can be made of the objective effectiveness of either intervention.

### 3.3. Winke, 2013 "*The Effects of Input Enhancement on Grammar Learning and Comprehension*"

**3.3.1 Overview.** Winke's first aim is to address whether TE and IF genuinely increase noticing of target forms in texts modified by IF in order to increase their salience. Secondly, she goes on to investigate the existence of a link between noticing induced by TE, acquisition and comprehension. Her work is based on Lee (2007), in which it was found that textually enhanced, input flooded texts increased acquisition, but had a deleterious effect on comprehension. This ran counter to Izumi (2002) and others (Overstreet, 1998; Wong, 2004) who found TE had little positive effects on acquisition, but supported the findings of VanPatten (2002) on input processing which show that increased attention to form leads to a decrease in comprehension. Winke replicates Lee's study to shift its focus towards attaining useful data on noticing, and secondly to use that data to help draw conclusions on IET, comprehension and acquisition.

To achieve her first aim, Winke uses an eye tracker to quantitatively measure noticing of enhanced target forms. Winke claims that compared to the difficulty of measuring changes in L2 learner's interlanguage, that eye movements is much easier and more reliable a measure of noticing. When learners don't recognize a word or form they spend more time returning to it and rereading it, even if they fail to understand it. Measuring eye movements would therefore help track noticing.

To investigate the second aim, Winke attempts to link her noticing experiments to the results of pre and posttests. If TE truly promotes noticing, then does exposure to enhanced forms induce learners to try to integrate forms into their interlanguage? Winke calls this process Post-Form-Noticing Processing. If this kind of processing does occur, then Winke hopes to discover exactly how this affects comprehension.

**3.3.2 Methodology.** Winke first screened her 80 test participants for reading proficiency prior to eye movement tracking. Of those 80 she derived valid data from 55. They averaged 23 years of age, were all intermediate learners attending

university ESL classes and came from 15 native language backgrounds. Winke used an error correction exercise in her pre test, centered on the English passive tense.

She used an eye movement tracker record their eye movements when reading a textually enhanced and input flooded passage to measure how it drew the participants' attention to the enhanced sections. Winke measured the total time one of their eyes fixed on the forms, the total number of times they looked at the forms, and the time they took to read the form initially and then to reread it. These criteria were used to assess noticing.  The passage selected was a modified authentic text, a news report, artificially input flooded with 17 instances of the passive tense. The text was divided up into sections and formatted to allow the eye tracker to make accurate measurements. Two version of the text were prepared, an unenhanced version and a TE version where the passive forms were underlined and in a red font. Winke calculated the averages of the participants' eye movements over the 17 instances of the target passive forms.

Winke used a free recall posttest task to assess the 55 participants' comprehension of the news report. They were asked to reproduce the story either in English or their native language. Performance on the task was measured by the participants' ability to reproduce discreet idea units identified by Winke. She then conducted a statistical analysis to see whether TE affected noticing.  She compared pre and posttest error correction scores and free recall test scores to assess whether TE had lead to increased grammar acquisition or comprehension.

**3.3.3 Results.** The results showed that, TE was marginally successful in promoting noticing of the passive form. These positive results did not extend to the acquisition of the form nor enhance comprehension. Winke found that the participants fixated on the enhanced passive English forms more than on the same forms in the unenhanced input flooded text.  The same is true of the amount of time participants spent rereading the target forms in the enhanced passage.  The effect was however, not repeated evenly across all 17 instances of enhancement. Those near the start of each page were fixated on and re-read the most, as were instances occurring in the upper left corner of the page. This shows that the gains in noticing IETs like TE bring about have declining returns over longer texts, but are effective in pieces of shorter length. The number of times people read each

form increased mildly in the enhanced passage. However, the amount of time participants spent reading the enhanced forms whilst initially skimming the news report was statistically unaffected. Overall the results show the positive impact of TE as compared to IF on noticing is measurable but marginal.

Although the enhanced group performed slightly better, Winke's analysis found no statistically significant gains in acquisition of the passive form between the groups reading the enhanced and unenhanced texts. Conversely, the unenhanced group fared marginally better at comprehension than the enhanced group, but not by a statistically significant margin. Her analyses found no correlation between the scores on the form acquisition tests and those on the comprehension tests.

**3.3.4 Analysis.** This is well-designed study, from its testing procedures, to its selection of test subjects and its use of technology to gather data. This last feature in particular makes an interesting addition to the IET literature. The use of technology to measure noticing is vastly more accurate than trying to deductively reason from assessments of changes in learner interlanguage. The present study has shown us that it is demonstrable that TE and IF can both be used to promote noticing under the right conditions. This method should be an avenue for further research. As Winke notes, this testing method has flaws. Cost is one, and another is that no matter how accurate its measurements, the results are still a result of features of the test design- the formatting of the text or which eye movements the researchers chose to measure. Nevertheless, inasmuch as any testing method can measure noticing, this study shows the use of eye trackers to be promising.

The conclusions drawn from the study echo those of Lee & Huang (2008). IF and TE were roughly equally as effective as each other at helping the learners acquire a target grammatical form. However, the data don't objectively support either approach. Conversely, Winke's analysis shows no trade off between meaning and form processing, going against the findings of Lee & Huang (2008) and VanPatten's (2002) proposal that TE negatively affects comprehension. Winke posits this could potentially mean the idea that form and meaning processing are concurrently vying for attentional resources is a misconception. However, we cannot ignore the possibility that her data go against the bulk of research on meaning processing because of specific features of the design of this particular experiment. In order to add further support to its findings the study would have to

be replicated, including variables such as text length, treatment length, wider age and ability ranges, different target forms and different pre and post testing procedures.

Winke wisely cautions against reading too much into her results on acquisition and comprehension in terms of their applicability in the classroom. When deciding whether IETs are an effective pedagogical tool, we should consider the fact that the strictly controlled test conditions under which these studies take place don't resemble a real classroom. There is a lack of specific task direction and of exercises designed to support that direction. As Winke puts it, "it is rare that a teacher floods forms or enhances them but never discusses the forms explicitly in his or her lesson." (Winke, 2013, pp.343). So when we consider the effectiveness of IETs we should bear in mind the difference between how SLA researchers treat them and how educators in real classrooms use them. As with the findings of Hernandez (2011) this gives hope for IETs to be of good value as one tool among many which educators can use.

Winke has provided an excellent example of how technology can be used in SLA research on noticing. Her data and methodology should serve as a guide for further research. They further add to the wide-ranging spectrum of data on the relationship between IETs, acquisition and comprehension. Some of it runs counter to what might be expected. It is possible to say therefore, that Winke has helped us understand more about the role of IETs in noticing, acquisition and comprehension.

## 4. Critical Summary

It is now vital to present a brief critical summary of the analyses presented here. By doing so, current thought on Input Enhancement Techniques may be better understood, and future avenues of study identified. Analysis of the results of the three papers suggests:

   i. The field of available empirical research measuring the link between IETs and acquisition, comprehension and noticing is slowly growing but is still very narrow.

   ii. Textually enhanced or flooded forms do indeed appear to promote noticing, especially in comparatively short texts, but don't always succeed at being

processed.

iii.  What positive or negative impact IETs do have on grammar acquisition and comprehension is sometimes statistically hard to measure. At other times the magnitude of their impact seems to be greatly contingent features of test design. As such, it is impossible to give definitive answers about the connection between IETs, acquisition and comprehension.

iv.  The exact way enhanced input is processed, from noticing through to positive interlanguage development, is not truly understood.

v.  Research done on IET under strict test conditions isn't equivalent to how they are deployed in the classroom.


## 5. Conclusion

This critical summary set out to investigate the current state of the literature on two controversial IETs, Textual Enhancement and Input Flood, a key issue facing SLA researchers and educators alike. The aim was to investigate whether any of the studies showed that input enhancement could meaningfully promote noticing, acquisition or comprehension. We discovered that the bulk of available data is unable to establish a definitive positive or negative link between both techniques, acquisition of grammar or comprehension. Although data come out of the Hernandez (2011) and Winke (2013) studies which suggests that IF and TE can have a positive impact, they are barely statistically significant, a result echoed in Lee & Huang (2008). The role of IET in this area seems very much up for debate. Noticing, as Schmidt (1990) described it, does indeed seem to be occurring as a result of enhancement. Winke (2013) makes this case very convincingly. However, this doesn't automatically translate into acquisition of target forms or comprehending the meaning of a target text. The data presented in these three papers can be said to represent a broad ranging overview of the state of research on key areas surrounding IF and TE. They also highlight many avenues for further study and analysis, as it is clear that a great deal is not understood about how learners process input. The more studies there are which build on the data presented here, the better SLA research into the field can filter down into everyday pedagogic practices.

# 6. Future Research

Areas covered in this critical summary require more study. First, if pedagogical tools are to be developed based on IETs, further research into their role in real classrooms is required. Second, if the goal of future studies is to establish a theoretical basis for the use of IETs, then researchers should consider how to eliminate interference from their test design, and better control of variables. Thirdly, it is clear that research on noticing is starting to benefit from the use of technology in its testing approach. It would be interesting to see whether technology can be similarly applied in the future toward measuring the links between IETs, grammar acquisition and comprehension. Fourth, including the studies in Lee & Huang's (2008) meta-analysis, every single study covered in this literature review examined the impact of IETs on reading and writing. Not one looked at speaking or listening, so there is a wide scope for research to be done into whether enhanced input can impact noticing, acquisition and comprehension in these areas.

# 7. References

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

Andersen, R.W. (1990). Models, processes, principles and strategies: Second language acquisition inside and outside the classroom. In VanPatten, B, and Lee, J.F., (Eds.), *Second language acquisition: Foreign language learning* (pp. 45–68). Clevedon: Multilingual Matters. Bardovi-Harlig, K. & Reynolds, D. (1995).

Berent, G. & Kelly, R. (2008). The efficiency of visual input enhancement in teaching deaf learners of L2 English. In Han, Z., (Ed.), *Understanding second language process* (pp. 80-105). UK: MPG Books.

DeKeyser, R.M., 1995. Learning second language grammar rules: An experiment with a miniature linguistic system. *Studies in Second Language Acquisition*, 17-3, 379-410.

De la Fuente, M. (2009). The role of pedagogical tasks and focus on form in acquisition of discourse markers by advanced learners. In Leow, R., Campos, H. & Lardiere, D., (Eds.), *Little words: Their history, phonology, syntax, semantics, pragmatics, and acquisition* (pp. 211–21). Washington, DC: Georgetown University Press.

Ellis, R. (1997). *SLA Research and Language Teaching*. Oxford: Oxford University Press.

Gass, S. (1997). *Input, interaction, and the second language learner*. Mahway, N.J.:Erlbaum.

Han, Z. Park, E.S., & Combs, C. (2009). Textual Enhancement of Input: Issues and Possibilities. *Applied Linguistics*, 29, 597-618.

Hernandez, T., (2001). Re-examining the role of explicit instruction and input flood on the acquisition of Spanish discourse markers. *Language Teaching Research*. 15, 2, 159-182.

Izumi, S., (2002). Output, Input Enhancement and the Noticing Hypothesis. *Studies in Second Language Acquisition*, 24, 541-577.

Krashen, S. (1982). *Principles and practice in second language acquisition*. New York: Pergamon Press.

Lee, S. (2007). Effects of Textual Enhancement and Topic Familiarity on Korean EFL Students' Reading Comprehension and Learning of Passive Form. *Language Learning*, 57, 1, 87-118

Lee, S., & Huang, H. (2008). Visual input enhancement and grammar learning. *Studies in Second Language Acquisition*, 30, 307-331.

Leow, R. P. (2001). Do learners notice enhanced forms while interacting with the L2? An online and offline study of the role of written input enhancement in L2 reading. *Hispania*, 84-3, 496-509.

Leow, R. P., Hsieh, H.C. and Moreno, N. (2008). Attention to Form and Meaning Revisited. *Language Learning*, 58, 665–695.

Long, M. (1983). "Does second language instruction make a difference? A review of the research." *TESOL Quarterly*, 17-3, 359-382

Long, M. (1991). Focus on form: A design feature in language teaching methodology. In De Bot, Kees; Ginsberg, Ralph; Kramsch, Claire. *Foreign language research in cross-cultural perspective*. Amsterdam: John Benjamins. pp. 39–52.

Mackey, A., & Philp, J. (1998). Conversational interaction and second language development: Recasts, responses and red herrings? *Modern Language Journal*, 82, 338- 356.

Nassaji, H. and Fotos, S. (2004). "Current developments in research on the teaching of grammar." *Annual Review of Applied Linguistics*, 24, 126-145.

Ortega, L. (2009). *Understanding second language acquisition*. London: Hodder.

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

Sharwood Smith, M. (1993). Input enhancement in instructed SLA: Theoretical bases. *Studies in Second Language Acquisition*, 15, 165–179.

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

Schmidt, R. (1993). Consciousness, learning and interlanguage pragmatics. *Interlanguage pragmatics*, 21, 42.

Schmidt, R. (1995). Consciousness and foreign language learning: A tutorial on the role of attention and awareness in learning. *Attention and awareness in foreign language learning*, 1-63.

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

Trahey, M., & White, L. (1993). Positive evidence and preemption in the second language classroom. *Studies in Second Language Acquisition*, 5, 181-204.

Truscott, J. (1998). Noticing in second language acquisition: A critical review. *SLA Research*, 14, 103-135.

VanPatten, B. (1985). Communicative value and information processing in second language acquisition. In Larson, P., Judd, E., and Messerschmitt D.S., (Eds.), *On TESOL: A brave new world for TESOL* (89–100). Washington, DC: TESOL.

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

VanPatten, B. (2002). Processing instruction: An update. Language Learning, 52, 755-803.

VanPatten, B. (2004). Input processing in second language acquisition. In B. VanPatten (Ed.), Processing instruction: Theory, research, and commentary (pp. 5–32). Mahwah, NJ: Lawrence Erlbaum.

Wagner-Gough, J. and Hatch, E. (1975). The Importance of Input Data in Second Language

Aquistion Studies. *Language Learning*, 25, 297–308.

Williams, J. & Evans, J. (1998). What kind of focus and on which forms? In Doughty, C., & Williams, J., (Eds.), *Focus on form in classroom second language acquisition* (pp. 139–55). Cambridge: Cambridge University Press.

Winke, P., (2013). The Effects of Input Enhancement on Grammar Learning and Comprehension, A Modified Replication of Lee (2007) with Eye-Movement Data. *Studies in Second Language Acquisition*, 2013, 35, 323–352.

Wong, W., (2004). The nature of processing instruction. in VanPatten B. (Ed.), *Processing instruction: Theory, research, and commentary* (pp. 33-66). Mahwah, NJ: Lawrence Erlbaum.

Wong, W. (2005). *Input enhancement: From theory and research to the classroom*. McGraw-Hill.