The Effects of Form-Focused Instruction on Implicit and Explicit Grammar Knowledge and Comprehension

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Abstract:

This study investigates the impact of three types of focus-on-form instruction (FFI) on learners' reading comprehension and their development of the English past unreal conditional. The study also investigates whether the learners' grammar development is implicit or explicit in nature. Fifty-one intermediate-level ESL learners were distributed into three groups. Each group read passages with different levels of explicitness of the grammar form: in the first input flood (IF) group, a baseline or control group, nothing was added to the text. For the second, textual enhancement (TE) group, the forms were enlarged and in bold. For the third rule presentation (RP) group, metalanguage describing the past unreal conditional was added to the flooded and enhanced forms. After reading, the participants' form noticing was measured through a self-circling test; their reading comprehension was measured through a free-recall test. Timed and untimed grammaticality-judgment tests (GJTs) were used to measure form learning. One week later, a second (delayed) GJT test was administered to measure sustained form learning.

When compared with the IF group, the RP group showed significantly higher results on the GJTs and significantly lower results on comprehension. The timed GJTs and noticing scores showed a significant inverse correlation with comprehension. These results lead to three suggestions. First, more explicitness leads to better development of implicit grammar knowledge. Second, less explicitness leads to more focus on meaning and concomitantly higher comprehension scores. Third, the effectiveness of FFI should be re-considered in light of this potential inverse (VanPatten, 1990) or trade-off (Barcroft, 2002) relationship between form and meaning.

Keywords: comprehension, explicit knowledge, form-focused instruction, grammar, implicit knowledge

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Numerous studies have demonstrated that various types of Form-Focused Instruction (FFI) with an intention to draw learners' attention to a specific morpho-syntactic feature has been effective in facilitating learners' subsequent processing of the target structure, leading to better intake (Alanen, 1995; Norris & Ortega, 2001). The tentative conclusion from these studies has been that the more explicit the FFI, the better learners process the grammar structure, resulting in better development of the target. However, what kind of grammar knowledge learners obtain from FFI has not been fully investigated. Moreover, how different levels of explicitness in FFI influences comprehension has not been studied thoroughly (Doughty, 1991; Lee, 2007; Leow, Egi, Nuevo, & Tsai, 2003; Wong, 2003). This study investigates these issues.

Literature Review

FFI and Form

FFI is a cover term to depict "any pedagogical effort to draw the learners' attention to form, either implicitly or explicitly" (Spada, 1997, p. 73). Various types of FFI have been arranged along a continuum of extreme implicitness to extreme explicitness. Among many others, Input Flood (IF), Textual Enhancement (TE), and Rule Presentation (RP) are three major types of FFI. The three have been investigated regarding grammar knowledge and noticing, i.e., focal attention for making input into intake (VanPatten, 1996).

Input Flood (IF) is one of the most implicit methods of FFI (Doughty & Williams, 1998). In IF, the salience of the target structure is produced by frequency, an important factor for processing and for the acquisition of L2s (Ellis, 1994; Hulstijn, 1995). Studies show that IF can be facilitative for the development of target structures, but not as effective for intake when compared with TE and RP; its effectiveness for intake is less than desirable. Trahey and White (1993) utilized IF for English adverb placement over a two-week period and found that IF was effective for acceptance and use of the grammatical English SAV order, but not for rejecting ungrammatical SVAO order. However, IF was less effective for noticing and intake than TE (Shook, 1994) and RP (Alanen, 1995). When the target feature is non-salient like English third-person *–s*, incidental IF was not effective for gain of either implicit or explicit knowledge (Loewen, Erlam, & Ellis, 2009). It is difficult to say how the results in those studies would hold if implicit and explicit knowledge were measured separately as results of FFI.

TE is a type of FFI that attracts learners' attention to form in written input by changing the properties of the text, such as using font change, italics, bold face, capital letters, color coding, and underlining (Sharwood Smith, 1993). Numerous studies on the effectiveness of TE on form learning have been conducted (Alanen, 1995; Doughty, 1991; Izumi, 2002; Jourdenais, Ota, Stauffer, Boyson, & Doughty, 1995; Lee, 2007; Leow, 1997, 2001; Leow et al., 2003; Overstreet, 1998; Shook, 1994, 1999; White, 1998; Winke, 2013; Wong, 2003). On the side of positive effects, TE has been proven effective for noticing (Alanen, 1995; Izumi, 2003; Jourdenais et al., 1995), recognition (Shook, 1994, 1999), recall (Alanen, 1995), production (Shook, 1994; 1999), and learning of target features (Lee, 2007). Contrastively, studies have also suggested that TE was *not* effective for intake (Leow, 1997), recognition (Overstreet, 1998), production (Overstreet, 1998), or acquisition (Izumi, 2003; Wong, 2003) of several morpho-syntactic features.

In light of these studies' findings, one can say that there have been no conclusions as to the effectiveness of TE on processing morpho-syntactic information. However, the studies suggest that TE does not *always* facilitate the learning process of target structures due to many potential variables, such as the features of target structures (Ellis, 1994; Shook, 1994), learners' prior knowledge about the target structure (Ellis, 1994; VanPatten, 1990), or learners' proficiency (VanPatten, Williams, & Rott, 2004). Or it could be that there are not always measurable learning gains associated with enhancement: the enhancement may "jumpstart a possible learning path" (Winke, 2013, p. 324), but the implicit nature of enhancement may not always be enough to spur measurable form-learning gains.

The third type of FFI, RP, is the most explicit (Doughty & Williams, 1998). This is a technique that provides learners with a metalinguistic description of the target forms (Doughty &

Williams, 1998). Overall, the effects of RP have been proven positive for noticing and target grammar acquisition (Norris & Ortega, 2001) and more influential than TE regarding the use of the target structure (Alanen, 1995). It was also suggested that without RP, TE might not be effective for development of grammar structures (Alanen, 1995; White, 1998; Winke, 2013). However, RP did not necessarily have an advantage for grammar learning compared to TE for middle proficiency learners with some knowledge of English relative clauses after ten sessions of instruction (Doughty, 1991).

FFI and Implicit and Explicit Grammar Knowledge

Previous studies have mainly focused on the relationship between FFI and grammar knowledge. Generally speaking, studies have found that RP results in greater accuracy in tests measuring explicit knowledge. Ellis maintained (2005a) RP is less likely to lead to improved accuracy in spontaneous oral language use, which measures implicit knowledge of the target structure(s). On the contrary, explicit FFI often makes it possible to master an L2 by providing opportunities for development of implicit knowledge (Hulstijn, 2002). The effectiveness of RP on implicit grammar knowledge requires more investigation.

It is arguably suggested that explicit learning results primarily in explicit knowledge and implicit learning results primarily in implicit knowledge (Ellis, 2009; Dörnyei, 2009; Hulstijn, 2002). Even though the suggestion concerning implicit learning and knowledge has been controversial due to what constitutes implicit knowledge and how to operationalize it (Dörnyei, 2009), three major studies attempted to investigate the effectiveness of RP on implicit and explicit knowledge. The researchers argued that RP facilitated the learning process and development of implicit and explicit knowledge in Experanto (an artificial language, de Graff, 1997), and in French (Housen, Pierrad, & Daele, 2005; Sheen, 2005). It is believed that the two types of grammar knowledge are two disparate structures neurobiologically (Dörnyei, 2009; Ullman, 2004), theoretically (Hulstijn, 2005), and psychologically (Ellis, 2009), but the relationship between the two types of knowledge and implicit and explicit FFI warrants more investigation.

Relationship between Form and Meaning

VanPatten (1996) claims that as one of the principles of L2 input processing, the Meaning Primacy Principle postulates "learners process meaning-bearing input for meaning before they process input for form" (p. 14). In ideal input processing for L1, form-meaning mapping at the semantic level and at the morpho-syntactic level should be well balanced and occur freely (VanPatten, 1996; VanPatten et al., 2004). However, due to limited linguistic knowledge and skills, L2 learners, especially beginners (VanPatten, 1990), consume much of their limited cognitive resources for comprehension. Therefore, meaning and form compete for attentional resources (e.g., noticing) in L2 processing.

Many studies have been conducted concerning the Meaning Primacy Principle, yielding some important findings. Only a limited amount of input can be attended to simultaneously for beginners (VanPatten, 1990) or at a given time as an operationalization for a time constraint (Greenslade, Bouden, & Sanz, 1999; Wong, 2001). However, when there are remaining attentional resources due to simplicity of the passages (Wong, 2003), short text length (Leow, 1997), or familiarity of the content (Lee, 2007; Overstreet, 1998), the learners may make form-meaning mappings using morpho-syntactic forms of high communicative value first. Advanced

learners, who have a considerable amount of stable prior knowledge about the target, can make form-meaning connections and develop intake of forms of little communicative value. Therefore, theoretically the more remaining attentional resources learners have, the better they can attend to forms with little communicative value (VanPatten, 1996).

Barcroft (2002) described more graphically the competitive relationship between semantic and structural processing using a processing-resource allocation (TOPRA) model. As depicted in Figure 1, this model also presumes that L2 learners have limited processing resources represented by the unmoving bold outer lines. The middle line is flexible depending on the degrees of elaboration or explicitness of instruction. Therefore semantic processing and form processing have a trade-off relationship with each other, supporting VanPatten's (1996) claim about competition between meaning and form.

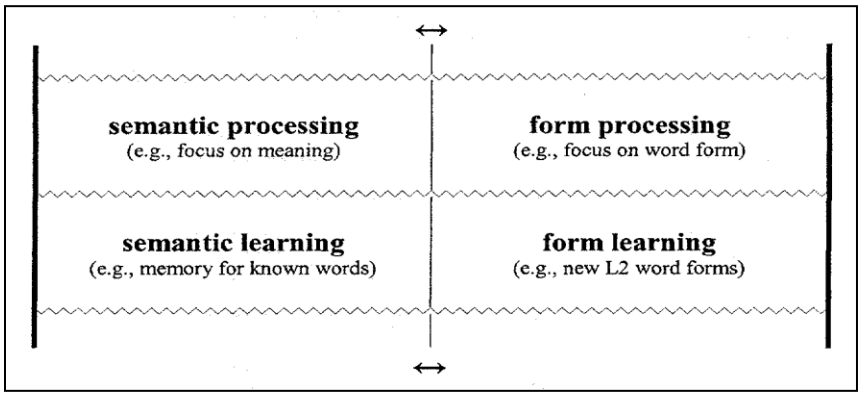

Figure 1. TOPRA model for the relationship between semantic processing, form processing, semantic learning, and form learning (Reproduction of Barcroft, 2002, p. 325).

A relevant question is whether the competitive or trade-off relationship between form and meaning is still valid even when learners have ample time to focus on form and meaning sequentially. Another question might be whether this either-form-or-meaning relationship changes if FFI with different explicitness is provided.

Relationship between FFI, Form, and Meaning

Studies have demonstrated that learners cannot pay focal attention to meaning and form due to their limited capacity (Greenslade et al., 1999; Leow et al., 2003; VanPatten, 1990; Wong, 2001). The logical question might be under what conditions learners' attention can be directed toward form in the input with less loss of meaning. Accordingly, the major concern of previous studies has been how explicitness in FFI changes the Meaning Primacy Principle (VanPatten, 1996), resulting in balanced focus on form and meaning.

Concerning the connection between FFI and the competitive relationship between form and meaning, a few studies demonstrated that TE does not influence comprehension (Leow, 1997, 2001; Leow et al., 2003; Shook, 1999; Wong, 2003). On the other hand, two major studies found that FFI has negative effects for comprehension (Lee, 2007; Overstreet, 1998) and two studies suggested positive effects (Doughty, 1991; Overstreet, 2002). In her unique study of RP, TE, and comprehension, Doughty (1991) suggested that RP influenced comprehension negatively, whereas TE influenced comprehension positively for 20 middle proficiency learners with some prior knowledge about English relative clauses. Based on relevant studies, Doughty

cautiously suggested that overall TE does not influence comprehension negatively, but TE can detract learners' attention from comprehension, depending on the learners' prior knowledge about the target structure and its communicative values (Ellis, 1994; Han, Park, & Combs, 2008).

The Present Study

Research has shown that an increase in the level of explicitness of FFI influences L2 learners' grammar knowledge positively and the more explicit FFI is, the greater the rate of form acquisition. However, the effects of different levels of explicitness on implicit and explicit grammar knowledge and comprehension have not been confirmed. At this juncture, a study that relates the effectiveness of instructional intervention with three different levels of explicitness on implicit and explicit grammar knowledge and comprehension is required. To that end, the present study aims to answer the following research questions:

RQ1. Do variations of FFI with different levels of explicitness influence ESL learners' implicit and explicit grammar knowledge?

RQ2. Do variations of FFI with different levels of explicitness influence ESL learners' comprehension and noticing?

RQ3. Are the two types of grammar knowledge, comprehension, and noticing related? If so, which might be the best predictor(s) of the two types of grammar knowledge?

Methodology

Participants

The participants were 51 intermediate-level adult ESL learners. They were recruited from an English learning institute at a large university in the Midwestern United States. Their L1s were Chinese (42), Korean (4), Spanish (2), Kazakhstani (2), and Arabic (1). Their average age was 21.02 years and their average age of onset for learning English was 10.53 years. On average, they had learned English for 10.49 years and had studied in the U.S. for one year.

Target Structure

For the purpose of operationalizing a learning situation where processing demands are amply taxing for the learners, the past unreal conditional was chosen as the target structure (see Appendix for example). The unreal conditional was found to be a relatively difficult rule for learners among the 17 English structures in terms of mean scores featured in Ellis (2006). Moreover, it has been defined as a complex grammar structure due to its features: 1) this structure has two clauses with verbs in different tenses, and 2) this rule requires extra attentional demands due to its higher degrees of abstraction compared with simple fact-based sentences (de Graff, 1997; Rosa & O'Neill, 1999).

Instruments

A total of 32 items for a written GJT were delivered using E-Prime. Sixteen items were distracters. Among the sixteen items for the target rule, eight items were ungrammatical and eight items were grammatical. The items were adapted and modified from *Grammar in Use* (Murphy & Smalzer, 2000). In a pilot study, five native speakers of English participated to judge the grammaticality of the 32 items and to record the time they used to judge each item. The time for each item was averaged and 120% of the mean time was allotted for each item (Ellis, 2005b).

The reading materials consisted of two parts, Readings 1 and 2, adapted and modified from *Grammar in Context* (Elbaum, 2005). Readings 1 and 2 were given to the IF group and TE group. The only difference was that for the TE group, the target structure was graphically enhanced using bolding in a slightly larger font. The RP group first received metalinguistic information about the target structure and out-of-context examples, and then read Reading 1. For the total reading administered to the IF and TE groups, the word count was 685 and the token count was 29. For the total reading for the RP group, the word count was 698 and the token count was 29.

Among many ways of measuring noticing (e.g., underlining, offline questionnaire, eye-tracking, think-alouds, stimulated recall), a self-recording method of noticing was used where learners circled words that drew their attention during Reading 1. Free-recall tests were paper-based and the participants were required to recall everything they could in English. After the delayed post-test, the participants answered a retrospective questionnaire.

Procedures

On Day 1, participants took timed and untimed GJTs using computers (Table 1). After the tests, the participants were divided into three groups randomly: IF, TE, and RP. Each participant took the paper-based treatment about the target structure for 20 minutes. The IF group read Readings 1 and 2 where IF was used. The TE group did the same reading as the IF group except that their reading had textual enhancement. The RP group received explicit rule presentation about the target grammar topic and read Reading 1 (see Appendix). In this way, the explicitness degrees were designed to increase from the IF group (IF only), the TE group (IF and TE), to the RP group (IF, TE, and RP). After the treatment, each participant took the self-noticing test and free-recall test on Reading 1. After the two tests, they took the same GJTs. The items in the GJTs were presented randomly.

Table 1
The Procedures of the Study

Day 1	Pretest	Timed and untimed GJTs		
	Treatment	Input Flood group	Textual Enhancement group	Rule Presentation group
		Reading 1 (without TE) Reading 2 (without TE)	*Reading 1* (with TE) Reading 2 (with TE)	Rule Presentation *Reading 1* (with TE)
	Noticing/ comprehension	Self-circling test for noticing, Free- recall test on *Reading 1*		
	Immediate posttest	Timed and untimed GJTs		
After one week				
Day 2	Delayed posttest	Timed and untimed GJTs		
	Questionnaire	Retrospective questionnaire		

One week later, on Day 2 for the delayed post-test, each participant took the same timed and untimed GJTs. After that, they filled out the retrospective questionnaire.

Data Analyses

Coding. For GJTs, the number of correct answers to each stimulus was tabulated. The perfect score was 16. For noticing levels, the number of the visually enhanced words that the participants drew circles around was tabulated. The full score of this test was 79, which is the number of words used for the target structure in Reading 1. For the free-recall test intended to measure comprehension, Carrell's (1985) definition of idea unit was used for scoring. In the scoring each idea was composed of a main or subordinate clause. Every infinitival construction, gerundive, nominalized verb phrase, and conjunct was also considered an idea unit (Carrell, 1985). The total number of idea units was 47. Inter-rater reliability between two raters' codings was measured using the Intraclass Correlation Coefficient (ICC). The average was .976.

Statistical Analyses. For RQ1, concerning the relationship between instruction and two types of grammar knowledge, mixed-design repeated measures ANOVAs were conducted separately for each type of knowledge. The dependent variables were the scores of the timed and untimed GJTs of the pretest, immediate posttest, and delayed posttest. The independent variable was type of instruction. For RQ2, regarding the relationships among three types of instruction, comprehension and noticing, two ANOVAs were employed using the free-recall and noticing test scores as dependent variables. The independent variable was instruction type. For RQ3, concerning the relationships between the noticing levels, two types of grammar knowledge, and comprehension, Pearson correlation coefficients were employed to obtain basic ideas about the relationships. Two multiple regressions were used for further investigation of the associations between the two types of grammar knowledge, comprehension, and noticing. The outcome variables were the two types of knowledge. For implicit knowledge, the predictors were explicit knowledge gain, comprehension, and noticing. For explicit knowledge, the predictors were implicit knowledge gain, comprehension, and noticing.

Results

A descriptive summary of the GJTs of the three groups for the unreal past conditional is shown in Table 2. As a preliminary process, the pre-timed and pre-untimed GJT scores of the three groups were compared with one-way ANOVAs. Pre-timed and pre-untimed GJT scores of the three groups were not statistically different from one another before treatment, $F(2, 48)=2.44$, $p=.10$ and $F(2, 48)=2.86$, $p=.07$, respectively.

Table 2
GJT Descriptive Statistics

		Input Flood n=17			Textual Enhancement n=17			Rule Presentation n=17		
Test	Time	Mean	SD	Gain	Mean	SD	Gain	Mean	SD	Gain
Timed GJT	Pre	7.35	1.41		6.88	1.54		6.41	2.21	
	Immediate Post	6.06	1.98	-1.29	7.24	1.15	0.36	7.47	1.59	1.06
	Delayed	6.94	2.11	0.88	6.59	1.54	-0.65	7.23	1.56	-0.24
Untimed GJT	Pre	7.59	0.94		9.06	1.95		8.76	2.39	
	Immediate Post	8.29	0.92	0.71	10.18	2.32	1.12	10.18	2.79	1.42
	Delayed	9.00	1.41	0.71	9.65	2.50	-0.53	8.88	2.39	-1.3

Two mixed design repeated measures ANOVAs were conducted to compare the influence of explicitness of instruction on timed GJT and untimed GJT. As Table 3 shows, there was no main effect for time, $F(2, 96)=.013$, $p=.987$, $r=.01$, which means there was not a change in the timed GJT scores over the three time periods when averaged across the group factor. There was not a main effect for instruction either, $F(2, 48)= .172$, $p=.842$, $r =.06$. This means that the three groups' means of the timed GJT scores were not statistically different when averaged across the time factor.

Regarding interaction effects, for the timed GJTs, there was a significant interaction between time and instruction, $F(4, 96)=3.667$, $p=.008$, $r=.19$. That means the changes in the timed GJT scores across three time periods are different for the three groups. The test of within-subjects contrasts proved that there was a significant difference of the timed GJT scores between the pre-test period and the immediate post-test period, $F(2, 48)=7.707$, $p=.001$, $r=.37$, but not between the post-test period and the delayed post-test period, $F(2, 48) =2.235$, $p=.118$, $r=.21$ or between the pre-test period and the delayed post-test period, $F(2, 48) =2.060$, $p=.139$, $r=.20$.

Table 3

Results of Mixed Design ANOVA for Timed GJTs

Variable	Df	*F*	*p*	*r*
Between subjects				
Instruction	2	.172	.842	.06
Within subjects				
Time	2	.013	.987	.01
Time X instruction	4	3.667	.008	.19

To further investigate the interaction effect, a one-way ANOVA on the gain between pre- and immediate post-test periods was conducted. This confirmed a significant effect of instruction in gain of timed GJT between pre- and immediate post-test periods. The IF group ($M=-1.29$, $SE=.48$) was significantly different from the TE group ($M=.35$, $SE=.51$), $p=.009$, $r=.30$, and the RP group ($M=1.18$, $SE=.25$), $p<.001$, $r=.79$. However, the TE and RP groups were not different regarding gains on the timed GJTs, $p=.181$, $r=.11$. These patterns are illustrated in Figure 2.

Concerning the untimed GJTs (Table 4), there was not a significant interaction effect between time and instruction, $F(4, 96)=1.791$, $p=.137$, $r=.19$. There was a significant main effect of time, $F(2, 96)=6.148$, $p=.003$, $r=.34$, which means that there is a significant change in the untimed GJT scores over the three time periods when averaged across the group factor. Pair-wise comparisons revealed that there was a significant difference in the untimed GJT scores between pre-test and immediate post-test time periods, $F(2, 48)=12.895$, $p=.001$, $r=.46$ There was also a significant difference of the scores between pre-test and delayed post-test time periods, $F(2, 48)=4.419$, $p=.041$, $r=.29$. There was a borderline significant main effect of instruction, $F(2, 48)=3.113$, $p= .054$, with a small effect size, $r=.25$ (Field, 2009). That means that when averaged across the time factor, the three groups' mean scores were close to a significant difference.

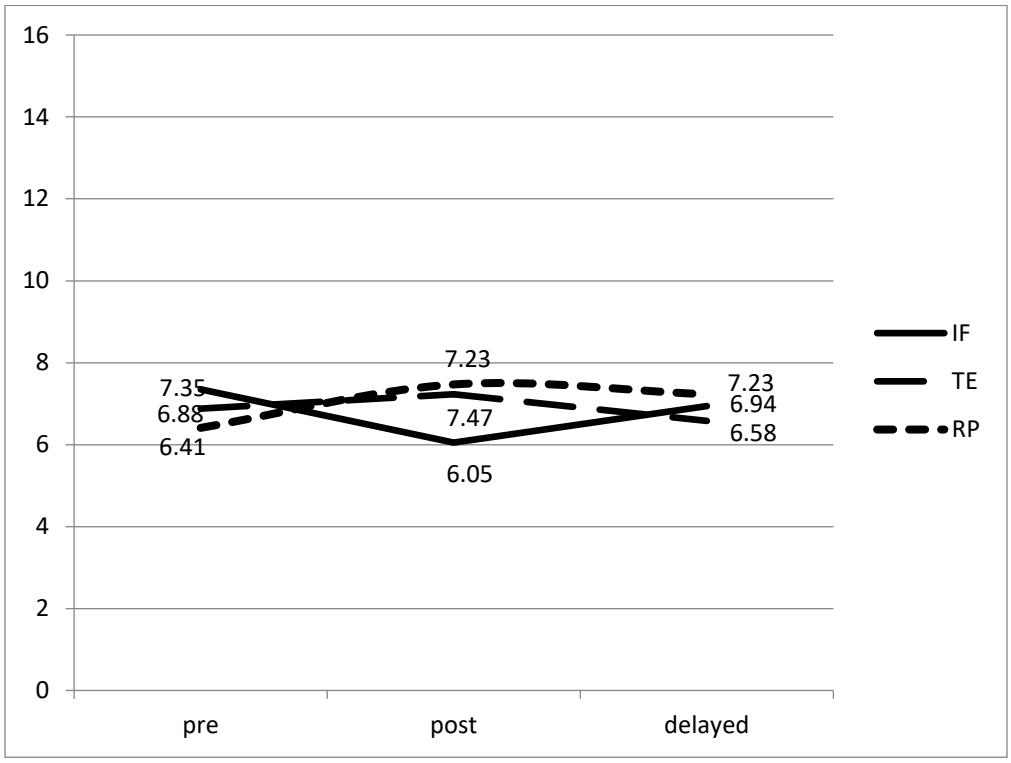

Figure 2. Profile plot for Timed GJT scores for three groups across three Time periods.

Table 4

Results of Mixed Design ANOVA for Untimed GJTs

Variable	df	*F*	*p*	*r*
Between-subjects				
Instruction	2	3.113	.054	.25
Within Subjects				
Time	2	6.148	.003	.34
Time X Instruction	4	1.791	.178	.19

As Figure 3 shows, the TE and RP groups showed an increase in untimed GJT scores between pre-test and immediate post-test periods, which is similar to the case of the timed GJT scores. The two groups' untimed GJT scores decreased between the immediate post-test and delayed post-test periods, which was also shown for the timed GJT plot. It is noteworthy that the RP group's increase and decrease of the scores were steeper than those of the TE group. The IF group's change in the scores indicated a remarkable difference from that of the timed GJT scores. The IF group showed a steady increase of the scores across the three time periods.

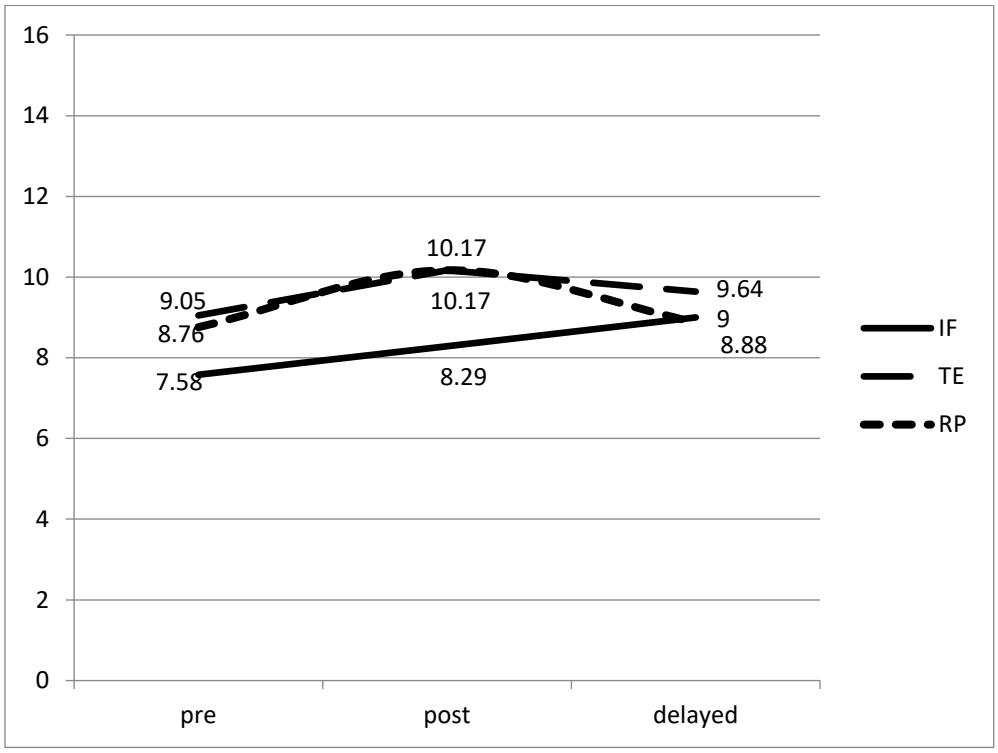

Figure 3. Profile plot for Untimed GJT scores for three groups across three time periods.

For Research Question 2, which asked about the comprehension test scores and the noticing levels of the three types of instruction, two one-way ANOVAs were conducted. Table 5 summarizes the descriptive statistics of the free-recall test and noticing levels.

Table 5

Descriptive Statistics for Free-Recall Test and Noticing

	Input Flood n=17		Textual Enhancement n=17		Rule Presentation n=17	
Test	Mean	SD	Mean	SD	Mean	SD
Free-recall	11.62	4.78	9.18	3.82	4.53	3.33
Noticing	5.59	6.45	26.76	24.52	29.88	21.48

Regarding the free-recall test, the IF group showed the highest mean score and the RP group demonstrated the lowest mean score. The TE group's mean score registered in the middle of the two groups. In terms of the noticing levels, the RP group demonstrated the highest mean score and the IF group showed the lowest mean score.

Table 6 demonstrates the results of two one-way ANOVAs. With regard to the free-recall test scores, there was a significant difference between the three instruction groups, $F(2,48)=13.60$, $p<.001$, whose effective size is large, $r=.60$ (Field, 2009). A post-hoc test, with Bonferroni adjustment, showed that the RP group ($M=4.53$, $SE=.80$) was significantly different from the IF group ($M=11.62$, $SE=1.16$), $p<.001$, $r=.86$ and TE group ($M=9.18$, $SE=.93$), $p=.002$, $r=.71$. In terms of noticing, a significant difference was found between three groups, $F(2,48)=13.60$, $p<.001$, whose effect size is threshold for a large effect, $r=.50$ (Field, 2009). Another Bonferroni-adjusted test revealed that the IF group ($M=5.59$, $SE=1.56$) was significantly

different from the TE group (*M*=26.76, *SE*=.5.95), *p*=.002, *r*=.67 and the RP group (*M*=29.88, *SE*=5.21), *p*=.001, *r*=.76.

Table 6
Results of ANOVAs for Free-Recall Test and Noticing

Sources	Dependent variable	df	*F*	*p*	*r*
Instruction	Free-recall test	2	13.60	.000***	.60
	Noticing level	2	8.07	.001**	.50

Note. *** p<.001, **p<.01

Concerning Research Question 3 about the relationship between gain scores of timed GJT, and untimed GJT, indication of level of noticing, and the free-recall test, Table 7 summarizes the results of the Pearson correlation coefficients without consideration of type of instruction.

Table 7
Correlations between Gains of GJTs, Noticing, and Free-recall Test

	Gain of timed GJT	Gain of untimed GJT	Noticing	Free-recall test
Gain of timed GJT	-	.241	.068	-.337*
Gain of untimed GJT		-	.108	-.017
Noticing			-	-.371*

Note. * Correlation is significant at the 0.05 level (2-tailed).

From the point of free-recall test, there were two significant negative correlations between the free-recall test scores and the two variables, gain of timed GJT scores and noticing. The free-recall test scores were negatively correlated with the gain of timed GJT with a medium sized association, *r*=-.34, *n*=51, *p*=.016. There was also a medium sized negative correlation between the free-recall test scores and noticing levels, $r = -.37$, $n = 51$, $p = .007$. Gain of untimed GJT was slightly negatively correlated with the scores of the free-recall test, but that was not statistically significant.

For further investigation on the combined association between the two types of grammar knowledge, free-recall test and noticing, two simultaneous multiple regressions were conducted. The results of the multiple regression with gain of implicit knowledge as the dependent variable are in Table 8.

Table 8

Results of Multiple Regressions for Variables Predicting Implicit Grammar Knowledge

Variable	β	SE β	Standardized β	*p*
Free-recall	-.150	.058	-.368	.013
Gain of untimed GJT	.233	.127	.245	.072
Noticing	-.009	.013	-.095	.513

The three variables in the model for implicit grammar knowledge explained 18% of the total variance in gain of implicit knowledge, $F(3, 47)=3.36$, $p=.027$. The free-recall test scores made a significantly negative contribution to the prediction of the gain of implicit knowledge (standardized beta= -.368, $p=.013$). Neither gain of untimed GJT (standardized beta= .245, $p=.072$) nor noticing (standardized beta= -.095, $p=.513$) significantly contributed to the gain of implicit knowledge. In sum, comprehension is the best predictor of implicit grammar knowledge gains, but in an inverse relationship.

Table 9 demonstrates the results of the multiple regression with the gain of explicit grammar knowledge as the outcome variable and with free-recall test scores, gain of explicit grammar knowledge, and noticing as the predictors.

Table 9
Results of Multiple Regressions for Variables Predicting Explicit Grammar Knowledge

Variable	β	SE β	Standardized β	*p*
Free-recall	.054	.069	.126	.435
Gain of timed GJT	.289	.157	.274	.072
Noticing	.013	.015	.136	.373

The three variables in this model explained 8% of the total variance in gain of explicit grammar knowledge, $F(3, 47)=1.34$, $p=.273$. The model itself was not significant; furthermore, the free-recall test scores did not make a significant contribution to the prediction of the gain of explicit knowledge (standardized beta= -.126, $p=.435$). Neither gain of timed GJT (standardized beta= .274, $p=.072$) nor noticing (standardized beta= .136, $p=.373$) significantly contributed to the gain of explicit grammar knowledge.

Discussion

The first research question was about the relationship between explicitness in FFI and the development of the two types of grammar knowledge of the past unreal conditional. Overall, more explicitness in FFI facilitates development of the grammar structure, as has been found in previous work (Alanen, 1995; de Graff, 1997; Housen et al., 2005; Jourdenais et al., 1995; Norris & Ortega, 2001; Lee, 2007; White, 1998). However, the results require more elaboration in terms of the relationship between degrees of explicitness and two types of grammar knowledge.

Concerning implicit grammar knowledge, there was a significant difference between the three groups on the immediate post-test. The RP group showed significantly better results than the IF group. This could be evidence that more explicitness leads to higher scores in timed GJTs and less explicitness leads to lower scores. This finding seems to support the idea that more explicitness facilitates the development of the target structure regarding implicit grammar knowledge as evidenced by better scores in timed GJTs (de Graff, 1997) and unplanned speech (Housen et al., 2005; Sheen, 2005). The current study also suggests that explicit instruction not only promotes explicit grammar knowledge, but also implicit knowledge. Researchers have suggested that knowledge learned through implicit learning becomes implicit knowledge and that knowledge gained through explicit learning becomes explicit knowledge (Dörnyei, 2009; Hulstijn, 2002). The results negate this claim. In this study, explicit learning facilitates implicit knowledge. IF is the most implicit and RP is the least implicit. Therefore, the IF group should demonstrate the highest score of implicit knowledge, whereas the RP group should demonstrate the lowest. As Figure 2 illustrates, the RP group's performance showed the best gain of implicit

knowledge and the IF group showed the worst gain between the pre and immediate post-test periods. These results could suggest that learning with high explicitness operationalized by RP can facilitate gain of implicit knowledge without implicit learning as a direct mediator (de Graff, 1997; Dörnyei, 2009; Housen et al., 2005; Hulstijn, 2002; Sheen, 2005).

Concerning explicit grammar knowledge, the results did not indicate a statistical difference between the IF, TE and RP groups, which means that more explicitness does not necessarily lead to higher untimed GJT scores. In other words, given enough time to answer the items in untimed GJT, all groups could arguably benefit from this exposure. The reason why the more explicit instruction in RP did not influence the learners' developing process in terms of explicit grammar knowledge might be explained in two ways. Firstly, there was no difference in noticing levels between the RP and TE groups, which might have resulted from the target structure's communicative value and perceptual saliency, as discussed by prior research in this area (Doughty, 1991; Ellis, 1994; Greenslade et al., 1999; Lee, 2007; Leow et al., 2003; Robinson, 1996; Shook, 1994, 1999; VanPatten, 1990; Wong, 2003). Language learners seem to pay attention to form, depending on the nature of the target grammar structure. The unreal past conditional is a meaning-bearing form with semantic value for the purpose of understanding the context. Moreover, the structure consists of two clauses with some formulated words, which makes the structure perceptually salient. These two features of the target structure might have drawn the two groups' focal attention to a similar degree and their noticing might have resulted in similar developing process of the target. However, frequency effect of IF, i.e., repetition without TE, was not as effective as TE or RP. Secondly, TE in this study might have been more saturated with the target form, drawing more attention on the form than TE in other previous studies. According to Lee and Huang (2008), the average reading length for one session in the studies is 377 words and 12 tokens per form. In this study, more words and tokens were utilized in TE—685 words and 29 tokens. This increase in words and tokens might have added the frequency effect for the TE learners, resulting in similar grammar development for the TE and RP groups. Based on these two reasons, with due caution, it can be suggested that when the target structure is complex and the learners have some prior knowledge about the feature, during a short period, RP might not necessarily be effective (Doughty, 1991). In other words, TE (Lee, 2007) and IF (Trahey & White, 1993) might be good enough to draw learners' attention and lead development of the target structure.

The second research question was about the relationship between explicitness of FFI, comprehension, and noticing. This study demonstrated that overall, more explicitness in instruction led to higher indications of noticing (Alanen, 1995; Jourdenais et al., 1995; Leow, 1997, 2000; Robinson, 1996; Shook, 1994) and to better implicit knowledge in the immediate post-test (de Graff, 1997; Housen et al., 2005; Sheen, 2005), but concomitantly lower comprehension (Doughty, 1991; Izumi, 2003; Lee, 2007; Overstreet, 1998; Wong, 2003). The RP group demonstrated the highest noticing, but their comprehension was negatively influenced. On the contrary, the IF group showed the lowest noticing and highest comprehension, while the TE group's comprehension was as good as the IF group's. This result is in line with studies that reported no negative effects (Leow, 1997, 2001; Leow et al., 2003; Winke, 2013; Wong, 2003) or even a positive effect (Doughty, 1991; Overstreet, 2002) of TE on comprehension.

FFI surely changes L2 learners' input processing. The Meaning Primacy Principle (VanPatten, 1996) is valid when there is not an intervention of FFI (VanPatten, 1990; Greenslade et al. 1999; Wong, 2001; Leow et al., 2008). However, when explicitness of instruction is a

factor, this principle does not always apply. In this study, when RP in a Focus on Forms (FonFS) context is used first and followed by TE, comprehension suffers. In other words, it appears the explicitness of RP in an out-of-context setting was strong enough to override the Meaning Primacy Principle and kept the learners' attention from going back to the primary meaning processing. On the other hand, the IF group also demonstrated a short-term inflexibility of input processing in the immediate post-test for implicit grammar knowledge. Twenty minutes could be long enough to focus on meaning and form freely. However, due to the low explicitness of IF, the group most likely could not utilize their remaining cognitive resources for form processing as well as the other two groups, resulting in the low implicit grammar knowledge in the immediate post-test. In sum, the IF group most likely did not turn their attention from meaning to form freely (Lee, 2007; Leow, 1997; Wong, 2003), nor the RP group from form to meaning. These cognitive inflexibilities emphasize the significance of effective FFI in input processing regarding form and meaning. The remaining issue for researchers is to investigate the proper degrees of explicitness of FFI for a balance between form and meaning using various grammar structures regarding communicative value, complexity, saliency, and learners' prior knowledge about the target structure.

RQ3 concerns the relationship between two types of grammar knowledge, comprehension, and noticing without taking instruction type into account. The overall results support previous studies that suggest that meaning and form are two competitive (Greenslade et al., 1999; VanPatten, 1990; VanPatten et al., 2004; Wong, 2001) and disparate constructs (Lee, 2007). The results also support that when the target structure is cognitively taxing, meaning and form are in a trade-off relationship (Barcroft, 2002). However, this result is not in agreement with Leow et al.'s (2008) work, which held that form processing does not influence comprehension negatively. This discrepancy might be attributed to the different complexities of the target forms. Leow et al. investigated form processing using Spanish morphological targets: *la*, *lo*, and *-n*. Processing these simpler forms may have caused the participants to process the information less deeply (Leow et al., 2008), failing to clearly demonstrate the competitive relationship of processing form and meaning. As Barcroft (2002) pointed out, the trade-off relationship between form and meaning can be found when the processing demands are highly taxing, as in this study's.

Concerning the competitive relationship between meaning and form, this study revealed a dichotomy between comprehension and implicit knowledge, but not for explicit knowledge (see Tables 7 and 8). This result could be explained by the nature of knowledge that learners tap into for comprehension. Knowledge for processing lexical items is inherently explicit due to its meaning-related attributes (Dörnyei, 2009; Paradis, 2009; VanPatten et al., 2004). That may mean that comprehension processing that requires form-meaning mapping for meaning-bearing words taps into explicit knowledge and explicit memory of the learners. Therefore, it can cautiously be suggested that because comprehension leads to focus on lexical meaning and form-meaning mapping processing taps into explicit knowledge by nature, the explicit grammar knowledge in this study is not necessarily negatively related to comprehension. In this case, implicit grammar knowledge may be arguably distinct from explicit grammar knowledge (from the perspective of a competitive relationship between form and meaning).

Implicit knowledge is claimed to be the default and more prevalent construct over explicit knowledge in L1 and L2 learning (Dörnyei, 2009; Hulstijn, 1995; Paradis, 2004; Ullman, 2004) and is not as susceptible as explicit knowledge to individual differences (Krashen, 1985;

Reber, 1993), time pressure (Ellis, 2005b), or the lapse of time (Allen & Reber, 1980). Ellis (1994) also emphasized the importance of implicit knowledge by saying, "Ultimately success in L2 learning depends on implicit knowledge" (p. 98). Even though explicit knowledge is important for adult learners, the implicit learning process and knowledge turn and integrate explicit knowledge into the subsequent input processing (Ellis, 1994). This means that tapping into implicit knowledge is default in L2 processing (Dörnyei, 2009; Ellis, 2009; Paradis, 2004) and implicit knowledge is more pervasive and crucial in language learning and use, whereas explicit learning is secondary or peripheral (Bialystok, 1978; Ellis, 2009; Krashen, 1985; Reber, 1993). As the results in this study demonstrate, only pervasive and prevailing implicit knowledge seems to compete with comprehension for learners' attention, resulting in a trade-off relationship between these two factors. It may mean that the inverse relationship between form and meaning could be narrowed into implicit grammar knowledge and comprehension. Definitely, more investigation is required on this issue.

Four conclusions can be drawn. First, more explicitness in FFI facilitates the development of a complex English structure in terms of implicit grammar knowledge. However, the effect did not last till delayed post-testing one week later, indicating short-term effects of higher explicitness. Second, RP out of context, followed by TE, might redirect input processing by having learners focus on form rather than meaning due to its high explicitness. This high explicitness also results in a detrimental effect on comprehension. In comparison, IF facilitates the development of the target structure in the lowest degree, but comprehension in the highest degree. Third, for the English past unreal conditional form that bears communicative value and salience, TE appears more effective than RP in that TE is not at a disadvantage in terms of syntactic development and at the same time has a significant advantage concerning comprehension. Fourth, implicit grammar knowledge and explicit grammar knowledge are two disparate constructs, as argued by Dörnyei (2009), Ellis (2009), Hulstijn (2005), and Ullman, (2004). In addition, implicit grammar knowledge and comprehension seem to be disparate and competitive for cognitive resources.

This study has two major pedagogical implications. First, teachers should bear in mind the trade-off effects when they engage in FonFS, FonF, and FonM. Due to the mid-range of explicitness, TE with IF embedded seems to be the most beneficial in terms of the balance between comprehension and grammar learning among the three types of instruction on the English unreal conditional for intermediate-level learners. Another pedagogical point is that even though studies have proven that FFI such as RP is effective for learning form (Norris & Ortega, 2001), this study also demonstrates that learners with RP cannot direct their attention from form to meaning freely. Therefore, when teachers want to use RP as preemptive and planned FonF (Ellis, Basturkmen, & Loewen, 2002), they will have to decide how to direct learners' attention naturally from form to meaning. As Jourdenais et al. (1995, p. 184) put it, "striking a balance between emphasizing accurate production of L2 forms and promoting meaningful communication in real context has been a recent concern in the field of second language teaching and acquisition." Regarding this concern, this study suggests potential benefits and pitfalls of three types of FFI—IF, TE, and RP.

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Appendix

Read the following passages carefully until the limited time is up (20')
After time is up, you will take tests based on your reading.

The Past Unreal Condition
** If I had been stronger (If Subordinate Clause), I would have become an athlete (Main Clause).
If + subject + HAD + Past Participle, subject + WOULD HAVE + Past Participle
Past Participle: taken, gotten, gone, eaten...

1. The unreal condition in the PAST can describe a situation that is NOT REAL. Use the Past Perfect (had + PP) in the IF clause and WOULD HAVE + Past Participle in the main clause.
- If you had been alive 100 years ago, you would have made about $200 a year. (You were not alive 100 years ago)
- If you had lived 100 years ago, you probably wouldn't have graduated from high school.
- If I had known you were in the hospital, I would have gone to see you.

2. COULD or MIGHT can be used in the main clause instead of WOULD.
- If you had gotten an infection, you could have died. (You didn't get an infection)
- If you'd given birth to a baby, it might have died young.
- If John hadn't lent me the money, I couldn't have bought the car.

3. If POSSIBILITY should be used in the IF clause, use HAD BEEN ABLE TO for the Past Perfect of COULD
- If my great-grandparents had been able to come to the U.S. 100 years ago, our lives would have been easier. (My great-grandparents could not come to the U.S.)
- If you'd been able to become a doctor 100 years ago, you wouldn't have been rich.

4. We often wish for things that were not real or true. Use a Past Perfect tense verb (had + past participle) to wish for something in the PAST.
- Reality: I didn't know my grandfathers when I was young.
- Wish: I wish I had known them when I was young.

- Reality: My aunt didn't have kids when she was young.
- Wish: She wishes she'd had kids when she was young.

If the real situation uses COULD, use COULD HAVE + Past Participle after WISH.
- Reality: My favorite dog died years ago. I couldn't clone my dog.
- Wish: I wish I could have cloned her.