The Effects of Input-based and Output-based Instruction on L2 Development

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Abstract

This study investigated the effects of input and output on the development of L2 knowledge. Participants included 129 third-semester Persian learners of English enrolled in 5 intact EFL classrooms functioning as four experimental groups and one control group. Two experimental groups received two types of input-based instruction, which differed from each other in terms of the saliency and the number of tokens of target structures in the input. Participants in another experimental group received instruction that required them to produce meaningful output that contained target structures. The last experimental group that only received explicit instruction about target structures was included in the study to specify the moderator role of explicit instruction, which was also included in the input-based and output-based instruction. The results of grammaticality judgment, multiple choice grammar, and written production tests administered as pre-test, immediate and delayed post-tests suggested that both input-based and output-based instruction can lead to the development of L2 knowledge. Our findings also support the claim that more obtrusive input in which target structures are more salient to learners has more positive effects on L2 development than just exposing learners to more tokens of target structure.

Introduction

Nobody denies the essential role that input plays in L2 acquisition. Meanwhile, it is widely acknowledged that exposure to input alone, though necessary, may not be enough for learners to reach advanced levels of L2 development. In addition to the role of input, output has also been recognized to play a crucial role in the process of L2 acquisition. There are conflicting views regarding the primacy of input or output for L2 acquisition. More specifically, there are studies that suggest that the role of output is secondary to the role of input and output merely facilitates access to an already developed L2 system (e.g., Benati, 2001; VanPatten & Cadierno, 1993; VanPatten &

Wong, 2004). These studies provided evidence that learners who received instruction which excludes any kind of output practice performed as well on comprehension and even production tasks as those who had output-based instruction. One form of output–based instruction is the one practiced in traditional audiolingual classrooms in which target structures were practiced devoid of any communicative context through different types of mechanical drills. VanPatten (1993) criticized such traditional practice-oriented instructions not only because of the use of mechanical drills, but also on the ground that they put "the cart before the horse" by asking learners "to produce when the developing system has not yet had the relevant intake data" (p. 436). The debate over the primary role of input and output in L2 development led researchers to compare the effects of different types of input-based and output-based instruction on L2 development.

Input-based instruction

Ellis (2012) defines input-based instruction as an instruction that "involves the manipulation of the input that learners are exposed to or are required to process" (p. 285). There are different forms of input-based instruction. One form of input-based instruction takes the form of VanPatten's model of input processing and its pedagogical spinoff Processing Instruction (PI) (e.g., Lee & VanPatten, 2003; VanPatten, 1993, 1996, 2002). In this type of instruction learners are pushed to process input by being asked to show that they have understood the meaning of a target feature in input by providing a non-verbal or minimally verbal response such as choosing between two pictures while listening to a sentence that describes one of the pictures (Ellis, 2012). PI is composed of two main stages:

1. Explicit information stage providing an explanation regarding target structure

2. Structured input activities aimed at pushing learners away from inefficient and incorrect processing strategies (VanPatten, 1996, 2004. For a detailed description of PI see Wong, 2004a, 2004b.)

Another way to implement input-based instruction more pertinent to the study is to manipulate the input in some way in order to make some target features more noticeable to learners. This type of input-based instruction usually takes the form of textual enhancement or input enrichment, also addressed in this study. Both techniques can be considered as focus on form instruction because they aim at drawing learners' attention to linguistic targets while they are primarily engaged in meaning comprehension. Long (1991) conceptualized focus on form as a kind of instruction that "overtly draws students' attention to linguistic elements as they arise incidentally in lessons whose overriding focus is on meaning or communication" (pp. 4-5). The interest in focus on form instruction (also known as form-focused instruction) was raised in 1990s as a result of research findings that suggested that exposure to input alone though necessary is not enough and some kind of formal intervention is needed for learners to reach advanced levels of targetlike competence.

Textual enhancement versus input enrichment

As a kind of focus on form instruction, textual enhancement, also known as visual enhancement, is commonly operationalized by underlining, **boldfacing**, *italicizing*, or CAPITALIZING (etc.) target input features under the assumption that learners are more likely to pay attention and as a result acquire those aspects of input that are more noticeable and salient. Input enrichment or input flood, on the other hand, refers to the process of seeding input with extra tokens of the target structure (Trahey, 1996; Trahey & White, 1993). In other words, in enriched input the target feature appears with high frequency but with no textual manipulation. It is believed that the increased tokens of input target forms attract learners' attention (Reinders & Ellis, 2009). Input enrichment also caters to the notion of incidental learning, defined as learning that results from learners being provided L2 input including a target feature. This is done without informing that they will be subsequently tested (Hulstijn, 2003).

A key question in the studies of textual enhancement or input enrichment is whether learners notice target input features. According to Schmidt's (1990) noticing hypothesis, noticing is "the necessary and sufficient condition for the conversion of input into intake" (p. 209). Schmidt (2001) also stated "people learn about the things that they attend to and do not learn much about the things they do not attend to" (p. 30).

A number of empirical studies investigated the effects of textual enhancement on reading comprehension (e.g., Lee, 2007; Loew, et al., 2003; Overstreet, 1998), noticing of target forms (Shook, 1999; Izumi, 2002) and also development of L2 knowledge (Allanen, 1995; Jourdandenais et al., 1995; Lee, 2007; Simard, 2009). While some of these studies provided evidence for the favorable effects of textual enhancement on L2 development (e.g., Lee, 2007; Jourdandenais et al., 1995; Simard, 2009; Shook, 1999), others found no significant effect for textual enhancement (e.g., Allanen; Overstreet, 1998; Loew et al., 2003). Furthermore, several studies reported unfavorable effects of textual enhancement on learners' reading comprehension scores (e.g., Lee, 2007; Loew, et al., 2003; Overstreet, 1998).

In a meta-analytic review of 16 previous textual enhancement studies, Lee and Huang (2008) explored the overall magnitude of textual enhancement on grammar learning. The very small effect size found ($d = -0.26$), compelled the researchers to conclude that L2 learners in their database barely outperformed other learners who were exposed to the same unenhanced input. However, as Lee and Huang (2008) pointed out, the very small effect size found for textual enhancement should be interpreted with care. The authors argue that such a small effect size can be the result of divergent methodological options that previous studies utilized. Thus, they called for more empirical research in future in order to draw more valid and confident conclusions on textual enhancement efficacy.

A number of other studies also investigated the effects of enriched input on L2 development (e.g., Trahey & White, 1993; Loewen, Erlam, & Ellis, 2009; Reinders & Ellis, 2009). The results of these studies are also mixed and inconclusive. For example, while Reinders and Ellis (2009) reported beneficial effects of input enrichment on the intake

and acquisition of English negative adverbs by adult ESL learners of English (exposed to 36 tokens of target form), Loewen et al.'s (2009) study indicated no evidence for the acquisition of English third person –s by adult ESL learners (exposed to 51 tokens of this target form in written input and 23 instances in aural input). Trahey (1996) also found that the effects of input enrichment on the acquisition of L2 English are limited.

One limitation of these textual enhancement and input enrichment studies is that previous research conflated the effects of enhanced and enriched input. In other words, they failed to distinguish the effects of textually enhanced and enriched input. Some prior studies failed to establish two different treatment conditions, each catering to one type of input. As a result, it isn't clear whether any positive effect of textual enhancement is the result of textual manipulation of the input or the recurrence of target forms as input enrichment.

Output-based instruction and L2 development

In contrast to input-oriented approaches to L2 acquisition, there are some researchers who allocate more positive and causal role to output in developing L2 system. These researchers do not deny the essential role of input in L2 acquisition. They do, however, reject the view that input alone is sufficient for language acquisition and gives rise to the development of linguistic system (e.g., Krashen, 1985; Schwartz, 1993, Izumi, 2002; Izumi & Bigelow, 2000; Izumi et al., 1999; Swain, 1995; Swain & Lapkin, 1995; Toth, 2006).

Swain (1985, 1995, 2000, 2005), outlining her output hypothesis, states that output is as essential as input in developing L2 knowledge to high levels of target-like precision. Swain (1985) claims that output "pushed" learners from the "semantic processing" required for comprehending input to the "syntactic processing" needed for encoding meaning (p. 249). Furthermore, Swain (1985) argues that producing the target language may serve as "the trigger that forces the learner to pay attention to the means of expression needed in order to successfully convey his or her own intended meaning" (p. 249). One important function of output, among others, according to Swain (1995, 2005) is helping learners notice the gap between their linguistic resources and the target language system.

The debate over the role of output in L2 acquisition revolves around whether it plays a primary or secondary role. There are empirical studies that shed some light on the issue. Most of these have compared the effects of some type of input practice (often within VanPatten's PI framework) to output-based instruction requiring learners to produce meaningful output. However, the results of these empirical studies are divergent and inconclusive. Most of these studies provided evidence that both input-based and output-based instruction lead to L2 development. Nonetheless, it is possible to classify these studies into three categories, namely studies that:

    a. Indicate input-based and output-based instructions are equally effective in promoting L2 knowledge (e.g., Farley, 2001b; Erlam, Loewen, and Philp, 2009)

b. Provide evidence for the advantage of input-based over output-based instruction (e.g., Benati, 2005; Farley, 2001a; Lee and Benati, 2006)

c. Suggest the superiority of output-based over input-based instruction (e.g., Allen, 2000; Toth, 2006; Morgan-Short and Bowden, 2006)

Erlam et al. (2009) explored the effects of input-based and output-based instruction on the acquisition of implicit and explicit knowledge of English indefinite article 'a'. Output-based instruction was operationalized via a meaning-focused presentation/practice/production (PPP) format. During the presentation stage, the learners were provided with explicit instruction about the target form. During the presentation stage, learners practiced the use of target form in a controlled meaningful context. Finally, during the production stage, learners produced the target forms in a free written task. Input-based instruction was operationalized based on PI model. The results indicated that both instructional groups significantly outperformed the control group that received no instruction and improved their implicit and explicit knowledge of the target form. Similarly, Toth (2006) examined the role of input and output in the acquisition of L2 Spanish morphosyntax by comparing PI (as a form of input-based instruction) to instruction where input and output occurred in a communicative, teacher-led classroom setting. The target grammar item was Spanish anti-causative se. The results indicated that while both groups progressed equally on a grammaticality judgment task, the output group outperformed the input group in a controlled production task.

In contrast, Benati (2001) investigated the effects of PI and output-based grammar instruction on the acquisition of a morphological feature of Italian future tense and indicated that the PI group outperformed the output-based group in an interpretation task while both groups made equal gains in a production task. In a laboratory study, Morgan-Short and Bowden (2006) explored the effects of input-based instruction in the form of PI and meaningful output-based instruction on the interpretation and production of Spanish preverbal direct object pronouns. Participants received treatments in two instructional groups designated as input-based and output-based instruction and were compared with a control group. While input-based instruction group had to interpret the target structure to complete the activities, the participants that received output-based instruction were required to produce direct object pronouns to complete the activities. The results indicated that both groups had measurable gains above the control group from pre-tests to post-tests. The researchers thus concluded, "[N]ot only input-based but also output-based instruction can lead to linguistic development" (p. 31).

Summary and limitations of previous research

As Ellis (2012) noted, the results of previous studies that compared the effects of input-based and output-based instruction with each other are mixed and inconclusive. One limitation of the previous studies is that they operationalized input-based instruction according to VanPatten's PI model and ignored other types of input-based instruction, such as textual enhancement or input enrichment. Furthermore, due to methodological complexities involved in PI, as Morgan-Short and Bowden (2006) argue, it is impossible

to determine whether the positive effects of PI is due to explicit instruction, input alone, or the combination of input and explicit instruction. Another limitation of previous studies of input-based and output-based instruction is that there is divergence in the way output-based instruction was operationalized. For example, some studies that reported a more positive role for output in L2 development, operationalized output within a more communicative and interactional context (e.g., Toth, 2006; Erlam et al., 2009). As Ellis (2012) argues, the ultimate benefits of input-based and production-based instructions depend on the interactions that arise during instruction. Finally, as it was noted before, previous studies of textual enhancement didn't differentiate the effect of enhanced input from enriched input. This conflation, according to Han et al. (2008), is one of the shortcomings of previous textual enhancement studies. To this end, we investigate the effects of input-based instruction in terms of textual enhancement and input enrichment and compare them with the effects of output-based instruction on the development of L2 knowledge. Furthermore, in order to isolate the role of explicit instruction, usually a component of input-based or output-based instruction, we formed another group that was only exposed to explicit instruction as treatment.

Research questions

The research questions guiding this study are:

1. Do input-based and output-based instructions lead to the development of L2 knowledge?

2. If both instructional conditions lead to development, which one is more effective?

3. Are textual enhancement and input enrichment equally effective in developing L2 knowledge? If not, which one is more effective?

Method

Design

This quasi-experimental study followed a pretest-post-test-delayed post-test design, working with intact EFL classes. The independent variable is instructional technique with four levels of enriched input, textually enhanced input, meaningful output, and explicit instruction. The dependent variable is the development of the target structure. The four instructional groups in the study are:

(1) Textual enhancement (TE)
(2) Input enrichment (IE)
(3) Meaningful output (MO)
(4) Explicit instruction (EI)

The treatment groups were compared to the control group. All the experimental and control groups received the treatments according to the following schedule: In the first treatment session, participants in the MO group received the treatments while in the

second and third treatment sessions participants in the TE, IE, EI and control groups received the treatments. The three treatment sessions were held on successive days.

Participants

The initial participant pool for the study consisted of 134 participants enrolled in five third-semester English courses in a major language teaching institution in Iran. The courses were part of a task-based program. Third-semester learners were chosen because the program was scheduled to introduce the target form at the beginning of the fourth semester. Five intact classes made up of the participants for the study were selected. The four intact classes forming the instructional groups were designated as TE, IE, MO, and EI groups while the fifth intact class was designated as the control group. TE and IE groups were tokens of input-based instruction in the study. Participants ranged in age from 19 to 35 and all either held graduate degree or were university student.

Except five learners who opted out of the study, all other participants stated their consent to participate in the study and were highly motivated to improve their English, as reported in anonymous consent forms which they completed prior to the study. The final sample for the study included 129 participants. Besides the researcher, three experienced EFL teachers were invited to the study to act as the research assistants and also learners' interlocutors during data collection sessions. Prior to the study, the researcher met the interlocutors several times and informed them fully about the research objectives and procedures.

Target structures

The target structure for the study is *so* vs. *such* in:

> *So* + adjective + *that* clause, as in:
> These boxes are **so** heavy that we can't lift them.

> *Such* + adjective + noun + *that* clause, as in:
> It was **such** an important exam that we studied all the night.

These target structures were chosen after considering VanPatten's primacy of content words principle (VanPatten, 1996). According to this principle, learners tend to pay more attention to content words at the expense of ignoring function words in order to obtain maximum information from input. More specifically, *so* and *such* in the above sentences have low communicative value and are low in saliency because such sentences are easily understandable even by ignoring the distinction between *so* and *such*. Thus, the above target structures can be considered as appropriate target structures for learners of the study to examine the effects of input-based and output-based instruction.

Operationalizations

Three important techniques operationalized in this study were: textual enhancement, input enrichment, and meaningful output production. Textual enhancement was operationalized by boldfacing target structures in the input. Input enrichment was operationalized by seeding the treatment materials with extra tokens of the target

feature. The number of target forms seeded in input enrichment materials was twice the number of target forms to which participants in the enhancement group were exposed. Finally, meaningful output was operationally defined as a technique which aims to develop learners' knowledge of L2, primarily through asking them to produce meaningful output.

Treatment materials and procedure

Treatment materials for the four instructional groups in the study are as follows:

(a) *TE*: Four short texts containing target forms chosen from commercial EFL textbooks, each containing approximately 250 words plus a short written explicit instruction regarding target structures

The texts were manipulated and reconstructed to fit the purpose of the study. As a result, each text contained 3 examples of each of the structures (3 *so + adj+ that clause* structures and 3 *such + adj + noun + that clause* structures). In order to increase the saliency of the target structures, all target structures throughout the texts were boldfaced and underlined. The following examples reveal how textual enhancement was operationalized in the study:

These boxes are ***so heavy that*** we can't lift them.
It was ***such an important exam that*** we studied all the night.

In order to maintain learners' focus on meaning, each text was followed by two comprehension questions regarding the events in the texts which learners were asked to answer. The texts were presented to learners in two separate sessions held in two successive days (two texts for each day). No strict time limit was set for learners to complete the activities. The written explicit instructions were accompanied by a brief oral explanation by one of the research assistants as well as two written examples for each structure. The participants first listened to the oral instructions, which lasted about five minutes and were asked to read the written instructions for another five minutes before reading the texts.

(b) *IE*: Six texts, each approximately 350 words long

Theses texts were also chosen from lower intermediate level EFL textbooks, but were seeded with the target structures. Each of the target structures appeared four times in each text. Thus, the total number of target structures in IE group materials was twice the number of target structures appeared in TE group materials. No typographical change such as boldfacing or underlining was applied to the IE materials. No explicit instructions were added. Like the TE group materials, each text was followed by two comprehension questions. The texts were presented to learners on two successive days, and as in the TE group, the activities were untimed.

(c) *MO*: The treatment was presented to learners in three stages in one single session

Learners were first divided into two groups of 6 and two groups of 7. Each group sat around a table with the presence of an interlocutor. During the first stage, over a span of ten minutes, each learner was presented with explicit instructions (both written and

oral) regarding the target structures, similar to the instructions presented to the TE group. In the second stage, each learner was provided with a 16-item completion task including 8 'so structures' and 8 'such structures'. Each item consisted of an incomplete sentence preceded by a description of that sentence. Participants were asked first to read each description and fully comprehend it and then complete each sentence using the target structures on a separate answer sheet. When the participants finished, their answer sheets were removed. The following example illustrates an item of the sentence completion task including an incomplete sentence and its description:

Description: My friend and I intended to go to the park. But, the weather was very cold. Therefore, we decided to stay at home.
Incomplete sentence: The day was …

Learners were given 30 minutes to complete the task and allowed to ask for the meaning of any word. During the third stage, the interlocutor read the description randomly and asked participants to raise their hands to complete the accompanying sentence. The process went on until all participants produced two grammatical sentences for each target structure (items could be produced more than once). In the case of a learner's production of an ungrammatical sentence, other participants volunteered to produce the correct one. (Appendix 1 provides the list of completion task items.)

(d) *EI*: The previously mentioned written instructions and four examples presented to the TE and MO groups in the first stage

One of the research assistants provided the participants with a brief oral explanation of the instructions. The same research assistant provided the explicit instructions for the three experimental groups that received explicit instruction.

The participants were asked to study the instructions and the follow-up examples for 15 minutes. The participants performed this activity twice on two consecutive days. Appendix 2 provides the explicit instruction and the accompanying examples presented to EI as well as TE and MO groups.

(e) *Control group*: the materials and the procedure were the same as for the TE group, except that no typographical modifications were made to the texts. In other words, the target structures were not boldfaced nor underlined. Furthermore, no explicit instruction was included in the materials.

Table 1 displays the major characteristics of each treatment condition.

Table 1. Characteristics of the treatment conditions

Treatment	Key Features	Time
MO	Meaningful production of target forms (output) plus explicit instruction	One session
TE	Exposure to textual enhanced 24 tokens of target forms plus explicit instruction	Two sessions
IE	Exposure to enriched input with 48 tokens of target forms with no explicit instruction	Two sessions
EI	Explicit instruction of target forms	Two sessions

Testing instruments and procedure

Three tests were administered on three occasions as pretest, post-test, and delayed post-test: an untimed grammaticality judgment test (UGJT), a written production task (WPT), and a multiple choice grammar test (MCGT). The inclusion of these three testing instruments helped us draw more valid conclusions regarding our results. The learners in all experimental and control groups took the pre-test two days before the first treatment session began, the immediate post-test two days after the last treatment session, and the delayed post-test two weeks after the immediate post-test. On each testing occasion, all three tests were administered with a 15-minute break between them. All tests were paper-and-pencil tests, and no strict time limit was set. A description of the tests follows:

UGJT
This test consisted of 30 sentences, 20 of which examined the correct use of the target structures. The other 10 items were distractors included to desensitize learners to the target structures in the pretest. Of 20 target structures items, 10 were grammatical and 10 were ungrammatical. A correct answer received one point. Learners were asked to show whether the sentences are grammaticality correct or incorrect. Learners' responses were scored as either correct or incorrect.

MCGT
The MCGT consisted of 30 items. Like the UGJT, the MCGT included 20 items targeting the correct use of the target structures and 10 distracters. Learners were asked to

choose the best answer among four options and mark their answer sheet. Correct answers received one point.

WPT

This test, employed to measure learners' productive knowledge of the target forms, consisted of 22 items, 12 of which assessed the production of the target forms plus 10 distracters. The test was divided into four parts. The first two parts consisted of 12 items that equally measured learners' production of the target structures. Each item consisted of a short narrative followed by a prompt. Learners were asked to use the prompts to complete the sentences using target structures. The other two parts, serving as distractors, elicited learners' production of relative clause and WH-question forms. The test began with directions and an example regarding how to answer the items.

Issues of reliability and validity

Test-retest reliability (Pearson r) was calculated only for the control group. For the pre-test and the immediate post-test, the consistency was .76 for the UGJT, .83 for the MCGT, and .79 for the WPT. For the pre-test and delayed post-test the consistency was .82 for the UGJT, .81 for the MCGT, and .77 for the WPT ($p < .05$). In order to examine the validity of the instruments regarding the measurement of the target structures, the testing instruments were piloted with a group of elementary-level EFL learners (n = 34) and a group of advanced-level EFL learners (n = 32) . The elementary-level pilot group was chosen from second semester English learners and the advanced pilot group was chosen from eighth semester English learners. Both pilot groups belonged to the same institute from which the participants were chosen. Table 2 displays the mean scores and standard deviations (SDs) of the pilot groups. Based on the number of items examining the target structures in each instrument, the maximum score was 20 for UGJT and MCGT and 12 for WPT.

Table 2. Mean scores and standard deviations for pilot groups

	Elementary		Advanced	
	M	*SD*	*M*	*SD*
UGJT	8.6	.76	17.25	.66
MCGT	3.4	.62	16.20	.83
WPT	1.6	.85	10.4	.91

As Table 2 indicates, while elementary pilot group not yet receiving instruction regarding the target structures performed poorly, participants in the advanced group obtained high scores for the three tests. The fact that the tests could differentiate properly between elementary and advanced groups can serve as an evidence for the validity of the tests.

Analysis

Raw scores for the UGJT, MCGT, and WPT were obtained for the three testing occasions. Descriptive statistics were estimated for the three testing periods for all groups. Participants' scores in the pre-test were submitted to a one-way ANOVA to see if there were any difference among the groups before the treatments. Mixed between-within subject ANOVAs were performed to explore learning gains over three testing periods with time and treatments as independent variables and learners' scores as dependent variable. Tukey's *post hoc* analysis was performed to see where the differences among the groups lay. An alpha level of .05 was set and SPSS 16 was used to perform the analyses.

Results

Tables 3, 4, and 5 present descriptive statistics for the UGJT, MCGT, and WPT scores over the three testing periods: pre-test, immediate post-test, and delayed-post-test.

Table 3. Group means and standard deviations for the UGJT

		Pretest		Post-test		Delayed Post-test	
	N	M	SD	M	SD	M	SD
Textual enhancement	26	8.88	.71	11.96	.77	11.11	.76
Input enrichment	25	8.44	.65	9.32	.74	8.70	.54
Output	27	8.92	.72	12.18	.73	11.29	.66
Explicit instruction	26	8.84	.73	10.00	.63	9.46	.58
Control	25	8.68	.69	9.10	.74	8.72	.54

Table 4. Group means and standard deviations for the MCGT

		Pretest		Post-test		Delayed Post-test	
	N	M	SD	M	SD	M	SD
Textual enhancement	26	4.50	.58	6.88	.76	6.19	.56
Input enrichment	25	4.68	.55	4.88	.60	4.60	.64
Output	27	4.55	.75	7.81	.73	6.85	.76
Explicit instruction	26	4.23	.65	4.88	.65	4.46	.50
Control	25	4.28	.67	4.52	.71	4.28	.54

Table 5. Group means and standard deviations for the WPT

		Pretest		Post-test		Delayed Post-test	
	N	*M*	*SD*	*M*	*SD*	*M*	*SD*
Textual enhancement	26	2.34	.62	5.50	.64	3.50	.57
Input enrichment	25	2.56	.71	3.60	.55	2.10	.55
Output	27	2.59	.81	6.80	.76	5.56	.50
Explicit instruction	26	2.00	.80	3.68	.68	1.92	.62
Control	25	2.08	.77	2.22	.87	1.61	.62

In the case of the UGJT (Table 3), all experimental and control groups showed a gain from pre-test to post-test; however, the improvements of the TE, MO, and EI groups seem to be more prominent than those of the other groups. Similar patterns are also evident in the delayed post-test. In the case of the MCGT, the gains of the IE and MO groups are more evident than in the other groups in both immediate and delayed post-tests. In the case of the WPT, most significant gains belonged to the MO and TE groups. Figures 1, 2, and 3 represent the mean scores for the three testing periods for the experimental and control groups. The figures confirm the initial impressions: participants in textual enhancement and output groups outperformed other groups in the UGJT, MCGT, and WPT over post- and delayed post-tests.
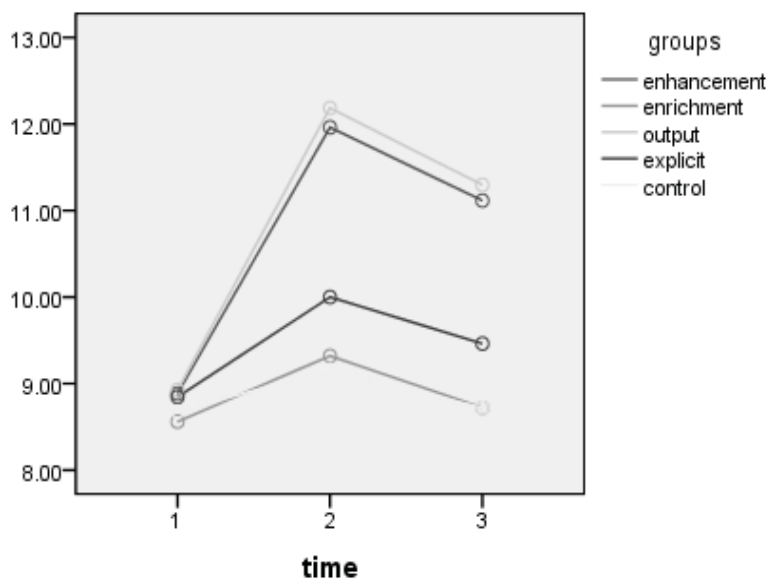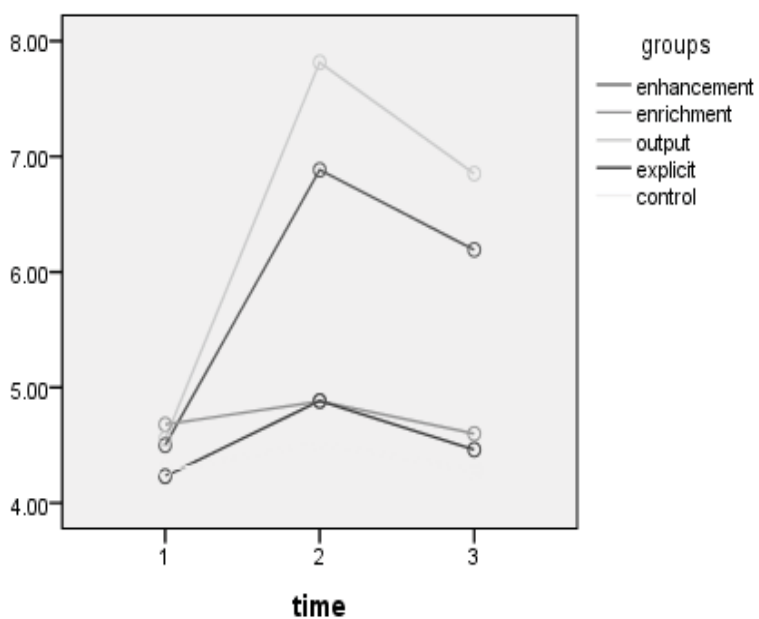
Figure 1. Mean scores for UGJT versus time

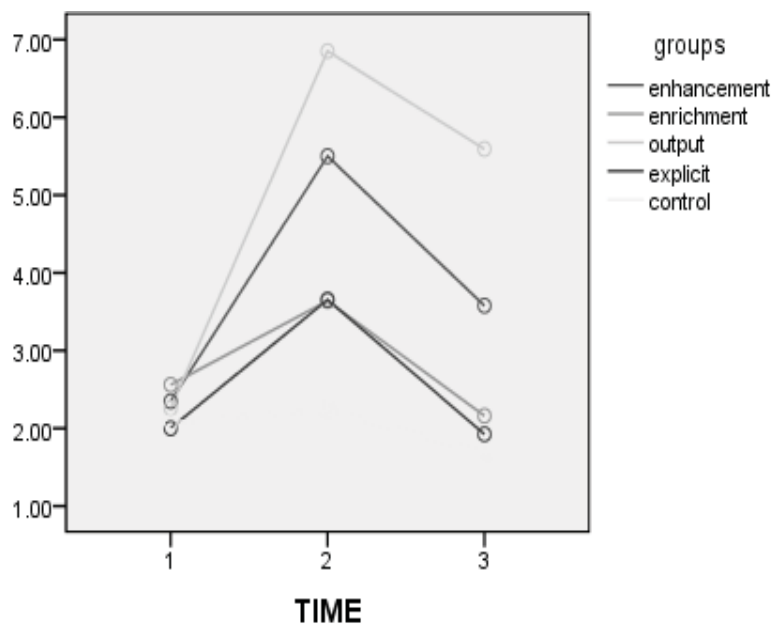**Figure 2. Mean scores for MCGT versus time**

Figure 3. Mean scores for WPT vs. time

In order to establish whether the experimental and control groups differ significantly from each other before the treatments, a one-way ANOVA was performed on the UGJT, MCGT, and WPT scores. No significant difference was found among the groups for the three tests (F_{UGJT} = 2.13, df = 4, p = .081, F_{MCGT} = 2.17, df = 4, p = .076, and F_{WPT} = 2.17, df = 4, p = .075). Furthermore, mixed between – within subjects ANOVAs were performed on UGJT, MCGT, and WPT scores to compare groups' scores over the three testing occasions. These results are displayed in Table 6. As the table indicates, main effects were found for time and treatment conditions (methods) for the three tests. This means that there were significant gains over time and there were statistically significant differences among the groups. The results also indicate interaction effect between time and treatment groups meaning that the experimental and control groups had differential improvements over time. This is what Figures 1 2, and 3 also displayed.

Table 6. Mixed between-within group ANOVA results

	UGJT		MCGT		WPT	
Source	*F*	*sig.*	*F*	*sig.*	*F*	*sig.*
Method (between group)	83.1	.000	103	.000	214	.000
Time (within group)	3.07	.000	1.5	.000	3.23	.000
Method*time	26.04	.000	23.42	.000	38.7	.000

In order to specify further the differences among the groups in the immediate and delayed post-tests, one-way between-group ANOVAs were performed for the UGJT, MCGT, and WPT scores. For the UGJT, significant between-group differences were found in both immediate post-test, $F(4, 124) = 126.74$, $p = .000$ and delayed post-test, $F(4, 124) = 79.64$, $p = .000$. Similar results were obtained for the MCGT scores in immediate post-test, $F(4, 124) = 197.54$, $p = .000$ and delayed post-test, $F(4, 24) = 155.32$, $p = .000$. Finally, for the WPT, significant difference was observed among the groups in the immediate post-test, $F(4, 24) = 159$, and also in the delayed post-test, $F(4, 24) = 210$, $p = .000$. Tukey's *post hoc* comparisons were used to isolate where the significant differences lay among the groups.

Regarding the UGJT, *post hoc* comparisons of both immediate and delayed post-tests indicated no statistically significant difference between the MO and TE groups while both groups outperformed the other groups. On the other hand, no statistically significant difference was observed between the IE and control groups.

Post hoc analysis of MCGT also indicated no statistically significant difference between EI, IE and control groups while the MO group outperformed all other groups including the TE group in both immediate and delayed post-tests. The TE group also outperformed the EI, IE, and control groups in both immediate and delayed post-tests.

Regarding the WPT, MO group significantly outperformed all other groups in both immediate and delayed post-tests. Furthermore, the TE group outperformed the IE, EI, and control groups in both immediate and delayed post-tests. The IE group also outperformed the control group in both immediate and delayed post-tests.

To summarize, the above analyses indicated that the MO and TE groups significantly outperformed other groups in all tests while the MO group outperformed the TE group. Furthermore, among the different treatment conditions, IE was the least effective instructional treatment to develop learners' knowledge of target forms. These findings are summarized in Table 7.

Table 7. Summary of findings

UGJT	MO = TE
	MO, TE > IE, EI, control
MCGT	MO > TE, IE, EI, control
	TE > IE, EI, control
WPT	MO > TE, IE, EI, control
	TE > IE, EI, control

Discussion

This study investigated the effects of input-based instruction in terms of textually-enhanced and enriched input and output-based instruction on the development of L2 knowledge. The first research question asked was: Do input-based and output-based instruction lead to the development of L2 knowledge? The results indicated that learners who received enhanced input along with those who received output-based instruction significantly outperformed other groups in the three testing instruments. Thus, the answer to the first research question is affirmative. Figures 1 and 2 confirm that both TE and MO groups improved significantly from the pre-tests to immediate post-tests, although there were some losses from the immediate post-tests to the delayed post-tests. Overall, despite both group's losses from post-tests to delayed tests, both TE and MO groups evidenced significant gains from pre-tests to delayed post-tests, and, therefore, both instructional conditions led to improved performance.

The second research question was: If both instructional conditions lead to improved performance, which one is more effective? The results of one-way ANOVA performed on immediate and delayed UGJT revealed no significant difference between the TE and MO groups. The MCGT and WPT scores, however, revealed a statistically significant gain for MO group over TE group for both immediate and delayed post-tests. In other words, textual enhancement and meaningful output had similar effects on participants' performance in the UGJT. The results of one-way ANOVA on MCGT and WPT immediate and delayed post-test scores on the other hand indicated the superiority of output over textual enhancement as displayed by Table 7. Given that the MO group outperformed the TE group in the MCGT and WPT but neither outperformed each another in the UGJT suggests the superiority of output practice over textual enhancement in promoting learners' knowledge of the target structures in this study.

The third research question was: Are textual enhancement and input enrichment equally effective in developing L2 knowledge? If no, which one is more effective? The results of ANOVA analyses presented above revealed that the IE group did not perform better than the control group in immediate and delayed post-tests while all other groups outperformed both. Although the IE group outperformed the control group in the WPT, the TE group outperformed both. Thus, it can be concluded that textual enhancement was more effective than input enrichment.

It is important to discuss these findings in relation to some theoretical support and empirical studies. Our findings for Research Question 1 suggest that both input-based (in the form of textual enhancement) and output-based instructions lead to the development of L2 knowledge. Regarding the effectiveness of input-based instruction, it is important to recall that only textual enhancement technique as a representative of input-based instruction led to L2 development and the other input-based instruction technique, namely input enrichment was among the least effective instructional techniques.

The positive effects of textual enhancement observed in this study can be attributed to the role of attention and noticing in L2 acquisition. According to Gass and Macky (2000),

attention mediates between input and intake. According to Schmidt's (1990) noticing hypothesis, attention controls access to awareness and is responsible for noticing, which is "the necessary and sufficient condition for the conversion of input into intake"(p. 209). It can be argued that the more salient and noticeable the input, the more likely it will be noticed and subsequently acquired. With regards to the answer to our third research question pointing to the advantage of output-based over input-based instruction, there are two positions about the role of output in L2 acquisition. One view states that input directly leads to acquisition but output might only affect acquisition indirectly or contribute to accessing a developing system. The other view states that both input and output can directly affect acquisition. Our results support the view that instruction dominated by output practice can lead to development even more efficiently than an input-based instruction.

Some researchers who endorse the first position may attribute the observed gains found for any output-based instruction to the incidental input that participants receive during the treatment. Such incidental input can't account for the effectiveness of output-based instruction in the study given that the number of target structure tokens to which learners in the MO group were exposed was fewer than the number of target structure tokens exposed to participants in the IE group. In other words, the total number of target structure tokens to which participants in the MO group were exposed was 36 (16 completion items being exposed to learners twice during the second and the third stages + 4 examples following explicit instruction), while this value for the IE group was 48. Thus, if input were the only causative factor, we would expect the enrichment group to outperform other groups, contrary to the results of our study.

Still, another possibility that could partially account for the effectiveness of output-based instruction here is the provision of feedback by an interlocutor after each learner's production, a component absent from other experimental conditions. However, it should be noted that any genuine communication entails feedback, and without feedback it was impossible to ensure participants' correct provision of the target structure.

Which mechanisms of output practice made it effective for teaching the target structures in the study? The benefits of output-based instruction observed in the study can be discussed with regards to Swain's output hypothesis. The current version of output hypothesis (Swain, 1995, 1998, 2005) assumes four major roles for output in facilitating L2 development: the noticing function, metalinguistic function, fluency function, and hypothesis-testing function. First, output provides opportunities for fluent and speedy use of language. This is called the *fluency* function of output. The second function of output is the *hypothesis testing* function. Output can help learners assess the comprehensibility and well-formedness of their utterances against feedback or reactions they receive from their interlocutors. Third, the *noticing* function of output provides opportunities for learners "to notice a gap between what they intend to say and what they can say leading them to recognize what they don't know or know only partially" (Swain, 1995, pp. 125-126). The fourth function of output is its *metalinguistic function*

by which it is claimed that "as learners reflect upon their own target language use, their output serves a metalinguistic function, enabling them to control and internalize linguistic knowledge" (Swain, 1995, p. 126).

Regarding the metalinguistic function, Swain (1995) claims that producing output might "stimulate learners to move from the semantic, open-ended, non-deterministic, strategic processing prevalent in comprehension to the complete grammatical processing needed for accurate production" (p. 128). In other words, the lack of automatized and procedural means of communication pushes learners to fall back into any declarative and metalinguistic information at their disposal. This will in turn provide a means for proceduralizing the newly developed L2 system.

The inclusion of the EI group in the study enabled us to isolate the effects of explicit instruction in the absence of other treatments. The results of the study revealed that both TE and MO groups outperformed the EI group in UGJT, MCGT, and WPT. Such results imply that textual enhancement and output-based practice that incorporates explicit instruction is more effective than explicit instruction *per se* and the effectiveness of input or output practice observed in the study is, totally or in part, independent of the explicit instruction presented to the participants. It should be noted that previous studies of textual enhancement that didn't present learners with explicit instruction regarding target forms obtained mixed results. Future research can shed more light on this issue by comparing the effects of textual enhancement with and without explicit instruction.

Conclusion

The results of this study suggest that both input and output can give rise to the development of L2 knowledge. However, our results suggest that output-based instruction can be more effective than input-based instruction. With regards to input-based instruction, the results indicated that exposure to input alone is not enough to promote the development of L2 knowledge and some form of intervention (such as textual enhancement or explicit instruction) is needed to make input more salient to learners. Our findings are thus compatible with Norris and Ortega's (2000) general finding that more obtrusive and explicit instruction is more effective than unobtrusive and implicit instruction. However, it was also found that explicit instruction *per se* confers no significant advantage to L2 learners and should be integrated into input or output activities. With regards to output-based instruction it should be noted that because producing output as a variable cannot be completely isolated from other variables such as interlocutor's feedback and input, we can't confidently claim that output in and of itself lead to L2 development. The best we can say is that instruction that capitalizes on meaningful output practice is as effective as or even more effective than input-based instruction.

About the Author

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Appendix 1. Treatment materials for the MO group

Part A.

Directions: read each of the following descriptions (marked 1 to 7) and try to fully comprehend them. After each description, complete the following
sentence as in the example:

1. I bought a book yesterday. It was a very interesting book. Therefore, I decided to read it all night.

The book was …..

The book was so interesting that I decided to read it all night.

2. Last night, we decided to go to cinema. The night was very cold. I decided to wear two coats.

The night was….

3. I had an exam yesterday. Because, it was difficult, I only answered 3 questions.

The exam was…

4. I went shopping with my dad. The shoes were very cheap. Therefore, I decided to buy three pairs.

The shoes were….

5. My mother baked a cake for my birthday. Because it was so delicious, I decided to eat three pieces.

The cake….

6. Because I stayed up late last night, I was tired at work today. Therefore, I decided to go home early. I was….

7. When I saw my score in the exam, I felt very angry and couldn't control myself.

I felt…

8. The car was very expensive. We couldn't afford to buy it. The car was ….

Part B.

Directions: read each of the following descriptions (marked 1 to 7) and try to fully comprehend them. After each description, complete the following
sentence as in the example:

1. The movie was so good. We decided to watch it 5 times.

It was …..

It was such a good movie that we decided to watch it 5 times.

2. Because the book was so interesting, I read it 4 times. It was …..

3. Because I had a very difficult exam, I decided to study all the night. It was ….

4. We went to a restaurant last night. But the food was horrible and we couldn't eat any of it. It was…

5. John is a very hard working student. He always gets the top score in our class. John is…

6. Marry was a very fluent girl. I thought that she is an American. Marry was…

7. Because the exam was very easy, I answered all the questions.

It was….

8. I couldn't afford to by the dress because it was very expensive. It was…

Appendix 2

Treatment materials for EI group

So can be followed by "an adjective" and "that" to show extremes that lead to certain results. In this structure "that" can be optional.

So + adj + (that) sentence

The music is so loud (that) I can't sleep.

The meal was so good (that) we decided to go to the same restaurant.

Such can be followed by "an adjective", "a noun" and "that" to show extremes that lead to certain results. In this structure "that" can be optional.

Such + adj + noun + (that) sentence

It was such a beautiful movie that we watched it several times.

Tom has such a big house that I get lost in my way to bathroom.