The relative effects of processing instruction and meaning-based output instruction on L2 acquisition of the English subjunctive

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Abstract
This study investigates the impacts of an input-based instruction (processing instruction, PI) and an output-based instruction (meaning-based output instruction, MOI) on the acquisition of the English present subjunctive form by Turkish EFL learners. There were three groups of participants involved in the study: (N=64). PI (n=19), MOI (n=23), and Control (n=22). The PI treatment consisted of structured input (SI) activities that involved sentence-level interpretation and production tasks whereas the MOI treatment involved structured output (SO) activities that required the participants to produce the subjunctive form to convey meaning. The improved performance of both instructional groups was equal at the interpretation level; however, at the production level the MOI group performed significantly better than the PI group.

Keywords: *input processing, processing instruction, meaning-based output instruction, the English subjunctive, Turkish EFL learners*

The role of input in second language acquisition (SLA) has received a great deal of attention and input has played a central role in many second language (L2) instructional interventions. For example, a number of studies find that Processing Instruction (PI) has positive effects on learners' processing mechanisms for acquiring grammatical forms when compared to traditional grammar instruction methods such as mechanical drill-based practice involving little or no communicative value (VanPatten & Cadierno, 1993; Cheng, 1995; VanPatten & Wong, 2004). Other studies have analyzed the effects of pushed output in instructed SLA (Farley, 2000; Benati 2001; Morgan-Short & Bowden, 2006). Pushed output can be defined as the attempts made by learners to produce L2 forms in real language situations which require learners' active participation. However, comparative research on the

differential effects of processing instruction and meaning-based output instruction (MOI) is limited.

The present study investigates the differential effects of PI versus MOI in a Turkish English as a foreign language (EFL) setting; specifically, whether or not PI and/or MOI have beneficial effects on learners' developing system with regard to their comprehension and production of the English present subjunctive form. It is the first study to examine the relative effects of PI and MOI instructional interventions in the context of Turkish EFL. The study is particularly designed to be conducted in a different EFL context since much of the research comparing the effects of PI and MOI has been done in contexts where Spanish is taught as a foreign language. Therefore, the results of previous research heavily rely on participant pools consisting of learners of Spanish L2 who speak English L1. The motivation to conduct the study in Turkey came from the idea that how learners who come from a different L1 background (in this case, Turkish) in a different EFL setting would do with different L2 learning interventions such PI and MOI. Therefore, this study is thought to contribute to the understanding of the beneficial effects of PI and MOI with a different group of learners.

Background and previous research

VanPatten (1993, 1996, 2002, 2004a) proposed a model of *input processing* (IP) to account for how learners derive intake from input in a second language with no reference to the SLA environment, be it instructed or non-instructed. Therefore, the term SLA is used in a broader sense referring to any context, be it English as a second language (ESL) or EFL, in which learners are exposed to a second language other than the first language. VanPatten categorizes IP as the initial stage of SLA that involves the transition process from input to intake. This subsequent form-meaning connection process is followed by the incorporation or accommodation of language data into the developing system depending on the nature and effects of the language data. The final stage involves the availability of language data for the learner as output, which is called access.

VanPatten's IP model is made up of a set of principles and subprinciples. Principle 1 and its related subprinciples suggest that learners attempt to understand the message conveyed in the input before they process the input for the linguistic forms it involves. Therefore, learners rely on lexical items to get meaning from the input more than they do so with non-meaningful grammatical forms. To elaborate on the first principle of VanPatten's model, VanPatten's (1985 and elsewhere) construct of *communicative value* needs to be introduced. It refers to the meaning that a form contributes to overall meaning in a stream of input and is based on two-features: +/- *inherent semantic value* and +/- *redundancy* (Wong, 2005). A form that has an *inherent semantic value* is a form that has some kind of meaning built into the form. *Redundancy* refers to whether the information carried in the form is also expressed elsewhere in a sentence or utterance. For example, in English the –*ing* form has [+inherent semantic value] and [- redundancy] and the complementizer *that* has [-semantic value] and [-redundancy]. The degree to which a form gets processed by learners and is made available in the intake for acquisition is dependent upon the degree to which that form has communicative value.

Principle 2, which is also known as *The First Noun Principle*, and its subprinciples deal with how processing input is affected by word order. Some languages like Spanish do not

follow a strict subject-verb-object (SVO) word order and learners may immediately rely on the initial linguistic item in the sentence or utterance and assign the role of subject or agent to it. By doing so, improper intake is sent to the developing system. When the word order seems to be compatible with that of learners' native language, they may rely on other cues such as lexical semantics (P2a), event probabilities (P2b), and context (P2c).

Processing instruction

Processing instruction (PI) is a type of explicit and focus-on-form input enhancement developed and revised by VanPatten (1993, 1996, 2002, 2004a) under the principles of input processing. The primary aim of PI is to help learners alter less-than-optimal processing strategies so that grammatical intake is richer than it would be in traditional instruction in which mechanical drills are employed and form-meaning connections are not encouraged. A prominent feature of PI is that learners never produce the target form in question during instructional procedures. PI has three basic components:

1. Learners are given information about how the target form or the structure works, focusing on one form at a time.
2. Learners are informed about a particular input processing strategy that might lead them to not notice and/or process the input incorrectly.
3. Learners are given structured input activities (SI) – activities in which the input has been manipulated to push learners to rely on the target form in order to get meaning and/or to privilege the target structure in the input so learners have a better chance of attending to it (Lee & VanPatten, 2003).

SI activities are prepared in a way that helps learners notice and subsequently process grammatical forms that might otherwise go unnoticed. SI activities never require learners to produce output; rather, they provide learners with chunks of language that involve the target grammatical form in question so that they can hear or see input. According to Lee & VanPatten (2003), the basic guidelines for creating SI activities are:

1. Present one thing at a time.
2. Keep meaning in focus at all times.
3. Move from sentences to connected discourse.
4. Use both oral and written input.
5. Learners must do something with the input.
6. Keep the learner's processing strategies in mind.

Two types of SI activities are used in PI: *referential* and *affective. Referential activities* require learners to pay attention to grammatical form in order to get meaning. These have a right or wrong answer so the instructor can check whether or not the learner has actually made the proper form-meaning connection. *Affective activities*, on the other hand, do not have right or wrong answers. Instead, they require learners to express an opinion, belief, or some other affective response as they are engaged in processing information about the real world.

Output in SLA

Output has generally been considered to be the most easily observable and accountable way of assessing linguistic knowledge. This view was rooted in the early language teaching methods in which presentation-practice was central in the form of repetition and mechanical drills involving little or no communicative value. This traditional approach was challenged by

Swain's (1985) introduction of the concept *comprehensible output*. It refers to 'the need for a learner to be pushed toward the delivery of a message that is not only conveyed, but that is conveyed precisely, coherently, and appropriately' (p. 249). Swain also suggests that production may force the learner to move form semantic processing to syntactic processing. VanPatten (2002) also states that output might act as a tool to draw learners' attention to something in the input and play a role in the development of fluency and accuracy.

Gass & Selinker (2001) outline four possible benefits of output that may provide learners with important language learning functions: (a) receiving crucial feedback for the verification of hypotheses in the conversation; (b) testing hypotheses about the structures and meanings of the target language; (c) developing automaticity in interlanguage production; and (d) forcing a shift from more meaning-based processing of the second language to a more syntactic mode. All in all, these functions may work all together when learners are given opportunities where they can incorporate new forms into their production in meaningful and communicative linguistic settings as opposed to traditional types of output practice which merely focus on the mechanical production of new forms in context-free and non-meaningful settings.

Structured output (SO) is defined by Lee & VanPatten (2003) as a special type of form-focused activity that is communicative in nature. Unlike traditional approaches to form-focused output practice which involved a transition from mechanical to meaningful, and to communicative, SO activities consist of two main characteristics: 1) They involve the exchange of previously unknown information and 2) they require learners to access a form or a structure with the intent to express meaning. The formation of structured output activities bears resemblance with the guidelines of developing structured input activities; however, the former refers to production while the latter to input. The guidelines for generating SO activities are:
1. Present one thing at a time,
2. Keep meaning in focus,
3. Move from sentences to connected discourse,
4. Use both written and oral output

(Lee & VanPatten, 2003)

The conclusions about output do not outweigh the role of input in SLA nor do they make input less prominent. According to VanPatten (2004b), presence or absence of a linguistic form in one's performance in the L2 in question does not indicate that the form has been acquired or not. He, therefore, concludes that output is not the direct path to acquisition, nor is acquisition dependent on output. In parallel with this, DeKeyser and Sokalski (1996) state that relative effects that could yield to effective or poor results on the acquisition of linguistic forms could be specific to the complexity of language structures used in experimental studies and the way research on input-output interface has been designed. Their study with 82 first-year Spanish L2 students revealed that the relative effectiveness of production and comprehension practice depends on the morphosyntactic complexity of the structure in question along with the delay between treatments and testing. In other words, one linguistic form might require comprehension practice (input exposure) for better acquisition whereas another form needs production practice (output practice) to be better acquired.

Previous studies on processing instruction and meaning-based output instruction

One line of research involves comparing processing instruction to traditional instruction (TI). Studies comparing the efficacy of these two instructional types in Spanish, French, and Italian have found that PI learners perform equal to or better than TI on a range of tasks including interpretation, comprehension and production. In their seminal study, VanPatten and Cadierno (1993) attempted to compare PI with traditional instruction to change the learners' reliance upon the first-noun strategy when processing input containing the target forms under investigation. They concluded that the PI group did significantly better than the TI group in comprehension tasks and performed just as well as the TI group on production tasks. Cadierno (1995) focused on the acquisition of the Spanish preterit tense, again comparing PI to TI. Participants who received processing instruction performed better than the other two groups on both comprehension and production tests, although the processing instruction group never produced the target form during the treatment.

Cheng (1995) compared acquisition of the Spanish copular verbs *ser* and *estar*, finding that the PI group that improved on the interpretation task, while both PI and TI groups showed almost equal improvement on the production and composition tasks. Using Italian future tense, Benati (2001) found that the PI group improved significantly relative to the TI group for the interpretation task and that PI and TI groups improved equally for the production task. Allen (2000) compared the effects of PI versus TI on the French causative, which involves the first noun strategy. She found that PI was as effective as TI enabling learners to interpret the French causative and that traditional instruction is more effective in enabling learners to produce the French causative. VanPatten and Wong (2004) replicated Allen's study and found different results from her study but similar results to the original VanPatten and Cadierno study (1993). They looked at the effects of PI versus TI focusing on the acquisition of learners' ability to improve and interpret the French causative. On the interpretation task PI group was superior to TI group, which was superior to the control group. On the production task, there was no significant difference between PI and TI groups. Both groups were superior to the control group. The gains did not hold over time.

Another line of PI research involves the comparison of PI to output-based instruction types. In a study by Farley (2001) 29 participants enrolled in a fourth-semester Spanish course were assigned to one of two treatments: PI and MOI. The MOI activities were all meaning-based and required learners to use both meaning and form at some level during production. The MOI group received the same explicit information as the PI group, but instead of structured input activities, they received activities that were designed so that the subjunctive forms were produced in utterance-initial position. The results indicated that processing instruction had an overall greater effect than meaning-based output instruction on how learners interpreted and produced the Spanish subjunctive of doubt. The output-oriented treatment and processing instruction were equally effective in a task involving production of subjunctive forms, but PI resulted in a greater effect than MOI on the interpretation task.

Farley (2004) presented a study that compared PI to a more meaning-based instruction that does not have any mechanical component. The investigation was based on a sentence level interpretation and sentence level written production measures. The participants consisted of 129 university students from ten different sections of a fourth-semester Spanish grammar review course. The target form in question was the Spanish subjunctive of doubt. The students

were randomly assigned to two treatment groups: processing instruction and meaning-based output instruction. Both PI and MOI had a positive effect on the participants' interpretation of the Spanish subjunctive of doubt, and the effects of both PI and MOI were retained over time. The results of the production data indicated both PI and MOI brought about improved performance on sentence-level tasks involving the production of the Spanish subjunctive of doubt. These effects were also durable two weeks after instruction.

In a parallel classroom experiment Benati (2005) investigated the effects of PI, TI, and MOI on the acquisition of the English past simple tense. There were three groups of participants. The first group received processing instruction; the second group was exposed to traditional instruction; the third group received meaning-based output instruction. One interpretation and one production measure were used in a pre-test and post-test design (immediate effect only). The results indicated that in both schools the processing instruction group performed better than the traditional instruction and meaning-based output instruction groups in the interpretation task and the three groups made equal gains in the production task.

Morgan-Short & Bowden (2006) investigated the effects of meaningful input- and output-based practice on the acquisition of word order and object pronouns in Spanish. First-semester Spanish students ($n = 45$) were assigned to processing instruction, meaningful output-based instruction, or control groups. Experimental groups received the same input in instruction but received meaningful practice that was input or output based. All assessment and treatment was done individually as the participants worked on computers. Both experimental groups showed significant gains on immediate and delayed interpretation and production tasks. Repeated-measures analyses of variance showed that overall, for interpretation, both experimental groups outperformed the control group. For production, only the meaningful output-based group outperformed the control group. These results suggest that not only input-based but also output-based instruction can lead to linguistic development.

In line with the aforementioned studies comparing the effects of PI and MOI, Keating and Farley (2008) examined whether MOI yields similar gains as PI due to incidental exposure to structured input. They compared the effects of PI, MOI, and another meaningful output-based instruction called meaning-based drills instruction (MDI) on the acquisition of Spanish direct object pronouns. They assigned beginning learners of Spanish (N = 87) to one of three groups: PI, MOI, or MDI. The assessment utilized a pretest-posttest design including sentence-level interpretation and production tests. The post-tests were administered right after, a week later, and a month after the treatments. On the interpretation task, PI was found to be superior to MDI, but not to MOI. On the production task, both MOI and MDI groups were superior to the PI group. VanPatten et al. (2008) partially replicates Keating and Farley (2008) by comparing three groups - PI, MOI, and Control - on two measures using a pretest/posttest/delayed posttest design. Their results do not replicate Keating and Farley's instead resemble more those of original research on PI and traditional instruction (e.g., VanPatten & Cadierno, 1993) and they discuss their findings in relation to the nature of MOI.

Research questions
This study compares the relative effects of PI and MOI on Turkish EFL learners' ability to comprehend and produce the English present subjunctive form. The research questions are the following:

Focusing on the English present subjunctive:

> *RQ1.* Does PI and/or MOI bring about significantly beneficial effects and improved performance on sentence-level interpretation tasks?
>
> *RQ2.* Does PI and/or MOI bring about significantly beneficial effects and improved performance on sentence-level production tasks?
>
> *RQ3.* If both PI and MOI bring about improved performance, is there a significant difference between the effect of PI and MOI on sentence level interpretation and/or production tasks?

Method and procedure

Participants

Sixty-four participants in three intermediate level English classes were randomly assigned to three groups: Processing Instruction (PI) (n=19), Meaning-based Output Instruction (MOI) (n=23) and Control (C) (n=22). The groups consisted of students enrolled in the upper-intermediate level English preparatory program of a university in Ankara, Turkey. Only sixty-four participants from a pool of approximately 90 students were included in the study. All participants were native speakers of Turkish that had not been exposed to any formal instruction on the target structure prior to the experiments. To be included in the data anlaysis, participants were required to be present during all phases of the experiment. Any participant who was absent in any part of the treatment was excluded from the study. In addition, participants demonstrating prior knowledge of the target on either of the two pretests (as demonstrated by a score higher than 70%) were also excluded. Participants normally received a communicative, task-based type of instruction. Explicit grammar instruction was regularly given with no mention of the processing problems; thus, learners applied only to their own processing strategies when confronted with new grammatical forms.

Target form and processing problems

The target form for this study was the present form of the English present subjunctive mood. The subjunctive is used to denote and emphasize urgency and importance. It is used after certain expressions like the following:

> (1) It is *imperative* that he *study*.
> (2) It is *essential* that we *be* there on time.
> (3) It is *required* that new policies *be* implemented to cure the effects of the economic crisis.

As seen from the above examples, the present subjunctive form in English is only noticeable in the 3rd person singular, the verb 'to be', and the passive constructions. It is formed in a subordinate clause tied to a main clause that includes lexical complements in the form of adjectives (essential, important, advisable etc.), verbs (recommend, demand, request etc.), and nouns (requirement, advice, obligation etc.)

There are two processing problems learners of English L2 might face with this grammatical form. One of them has to do with VanPatten's (2004a) *Lexical Preference Principle* which states that learners rely on lexical items more to get meaning from the input than they do on grammatical forms. Since the lexical items in the main clause that denote

importance or urgency (the meaning of subjunctive mood) will be processed first, learners might fail to process the subordinate clause that involves the subjunctive form and re-communicates the same notion. In this sense, the subjunctive marker is [+redundant] and therefore has lower communicative value.

The other processing problem is related to VanPatten's (2004b) *Sentence Location Principle* that states that learners tend to process items in sentence initial position before those in final position and those in medial position. As the subjunctive is located within the subordinate clause in sentence-medial (or sentence-final) position, it is less likely to be processed than if it were found in sentence-initial position.

Since Turkish does not have a particular structure to denote subjunctive meaning, no cross-linguistic association or connection can be made between English and the participants' native tongue Turkish. One special problem that could delay the acquisition of the subjunctive form by the participants regards the 3rd person marker –s. The participant pool in this study consists of upper-intermediate level of EFL learners that have prior knowledge about the present tense in the indicative form. They know that the verb in an indicative present tense sentence takes the present tense marker –s if the subject is the 3rd person form as in "John *does* his homework" Therefore, they are less likely to omit the marker in the subjunctive form, which they have to in order to form a grammatical subjunctive sentence as in "It is essential that John *do* his homework. All in all, learning the subjunctive is a new challenge for them because it totally alters a previously learned grammatical rule, thus making it hard for the subjunctive form to be easily and quickly processed and produced.

Materials

Two treatment packets were used in this study, one for each instructional group. The PI packet consisted of a one-page handout containing explicit information (EI) about the English present subjunctive along with SI activities. The MOI packet also included the same explicit information handout as PI along with SO activities. The EI handouts were delivered to participants in English and included information concerning how the subjunctive is formed; where the subjunctive is located; when the subjunctive is used (to express strong necessity or urgency); and the processing problem related to the subjunctive.

Participants were told that the verb does not take the 3rd person simple present tense marker - (e) s when the subject of the subjunctive clause is a 3rd person. Also, the participants were asked to pay attention to the predicate of the main clause to see if it contains any lexical items such as *recommend, demand, essential, requirement* that necessitate the use of the subjunctive form.

Lastly, the participants were made aware of the specific processing problems related to the subjunctive. They were told verbally that the subjunctive is a redundant morphological marker and therefore may go unnoticed. Moreover, they were told to be aware of the subjunctive marker and its presence in sentence-medial position, a location where it might be ignored.

PI treatment

PI treatment consisted of two parts: (1) the presentation of the target form along with the explicit information sheet, and (2) SI activities designed to explicate the use of the English present subjunctive form in a variety of exercises. The examples on the EI sheet were read aloud by the instructor. All explicit information was delivered via the participants' L1, Turkish. After explicit instruction was given about the target form, participants were engaged in SI activities. A total of 8 activities were designed, 6 referential and 2 affective. Referential activities required participants to find the correct answer out of possible other alternatives, while affective activities were based on participants' opinions or ideas about a subject specific to the activity. It should be noted here that the production of the subjunctive form was neither targeted nor included in any of the SI activities. Vocabulary used in the activities was appropriate for the participants' level of English.

MOI treatment

The MOI treatment also included two parts. First, the participants received the same EI sheet in PI packet and they were provided with the same information or explanation about the target structure. The presentation and the order of the information delivered to the participants were identical to the PI group. Second, the participants were engaged in SO activities partly fashioned out from the SI activities in the PI packet. There were 8 activities in the SO packet in total, all of which required the participants to produce the present subjunctive form in written form. Written answers were shared orally in class and the exchanged responses were checked by the researcher instructor. Four of the activities were referential in nature, that is, the participants had to generate an answer according to a given situation or text using the target form. The remaining four activities were affective in nature, which means that alternative responses were possible depending on participants' beliefs, thoughts, and experiences. In other words, the content of the response was up to the participants but the structure that they were supposed to use was the present subjunctive form in English.

Assessment tasks

All pretests, immediate posttests, and delayed posttests consisted of both an interpretation task and a written production task. No distractor task was given in between the interpretation and production tasks.

The interpretation task consisted of 20 items, 10 targets and 10 distractors. All items were multiple choice questions seeking one correct answer according to a given situation. Target items required answers including the English present subjunctive form and the distractors asked for answers in the indicative mood and present tense. In the interpretation task participants were given a situation and asked to choose the best alternative out of two according to their interpretation of the situation. The vocabulary used in the interpretation task included common and high-frequency items.

The production task was also made up of 20 items, 10 targets and 10 distractors. The whole task consisted of three parts. The first part was a sentence match task in which participants had to match two lists of sentence parts using the correct form of the verb according to a given situation. This part involved the correct interpretation of the situation and the production of the subjunctive form. The second part was a five-item sentence completion task in which participants had to complete 3 of the items with the subjunctive form and the rest

with present tense using the expressions provided in a box in the light of a given situation. The final part was an open-ended sentence completion task consisting of 10 items. This was also based on different situations and each situation had two sentences to be completed. As in the interpretation task, the vocabulary used in this task again consisted of common and high-frequency words.

Three versions of interpretation and production tests were prepared. Items like the subject, verb, and object were changed in each version. The items were designed in a way that the answer of one item could be different in other versions of the same item. The order of the items in three versions was also changed, thus, the participants could not do the tasks in the same order in three versions. Examples of interpretation and production task item versions can be seen in Appendix-1.

Procedure

A split-block design was used that included three versions of the same test: A, B, and C. Table 1 summarizes the test assignments by instruction type.

Table 1
Distribution of Test Versions across Treatment Groups

Instruction Type	PI	MOI	Control
Pretest	A	B	C
Posttest 1	C	A	B
Posttest 2	B	C	A

The pretests were administered to both treatment groups on two consecutive days. The PI group had the pretest on a Thursday and the MOI group had it the next day, Friday. To control for familiarity of vocabulary, participants were asked to skim the test for a minute to see if there were any words unknown to them. The researcher provided them with the meanings of the vocabulary words, and the interpretation task was always given before the production task. Due to a national holiday period in Turkey, treatments took place exactly two weeks later. All testing and treatment were conducted in the participants' regular classroom by the researcher. The treatment for both the PI and MOI groups took almost two class periods which equaled to 80 minutes. Twenty minutes of this period were allotted for the instruction and the rest was spent engaging participants in the activities.

Both groups were administered the immediate posttests at the end of the treatments, and a delayed posttest a week later. The pretests served both as a baseline measure for the effects of the treatments and as a way of eliminating subjects from the final data pool. Participants who scored 70% or higher on both interpretation and production pretests were removed from the final analysis.

Scoring

Raw scores for each participant were calculated for both interpretation and production tasks. With regard to the interpretation task, each correct response to the 10 target test items was given a score of 1 for a possible total of 10. Likewise, each correct answer to the 10 distractor items was given 1 point for a total of 10. Incorrect responses were given a score of 0. Correct responses included choosing the correct alternative in the items according to given

situations. An arbitrary score of 7 out of 10 on the interpretation task was set so that any participant who scored 7 or above on the interpretation pretest was eliminated from the analysis.

For the production task, raw scores were calculated by counting each correct response to the 10 target items for a total of 10, and 10 distractor items for a total of 10. If the participants correctly produced the present subjunctive form, they received 1 point. If the participants used a modal expression to denote urgency, or suggestion in the subjunctive clause such as 'It is necessary that he *must* put an end to war in Iraq', they received 0.5 points. Although the use of a modal verb is perfectly grammatical, the verb in the subjunctive clause was supposed to be in the bare form so that the acquisition/learning process could be better assessed. Therefore, giving a full point on responses that were formed with a modal verb would have misguided the results of the study and this is why those responses were given the minimum points possible.   Responses that were either incorrect or missing the target form were given 0 point. As in the interpretation task, participants who scored 7 or above on the production pretest were eliminated from the study.

Analysis and results

Pre-test scores

A series of one-way ANOVAs were performed on the pre-test scores to determine whether there were any significant differences in performance across the three groups prior to treatment. The ANOVAs revealed the following:

- Interpretation Test: There was an effect for Group, $F(2, 61) = 6.384$, p < .0030. Post-hoc Scheffe tests revealed that this effect was due to Control group being better than PI (p < .0036). No other contrasts were significant.
- Production Test: The ANOVA did not yield any effect for Group, $F(2, 61) = 1.925$, p < .1547)

Interpretation Task

Table 2
Interpretation Data: Means and Standard Deviations for All Groups

	Group					
	PI (n = 19)		MOI (n = 23)		Control (n = 22)	
	M	SD	M	SD	M	SD
Pretest	2.895	1.197	3.435	1.562	4.318	1.041
Posttest 1	6.474	2.010	7.304	2.141	5.182	1.532
Posttest 2	5.105	1.853	6.130	1.660	5.364	1.497

range=0-10

Mean scores and standard deviations for all groups appear in Table 2. A repeated measures ANOVA was performed on the interpretation data (see Table 4) with Group (PI, MOI, Control) as the main independent variable and Time (pretest, posttest 1, posttest 2) as the repeated measure. The analysis yielded a main effect for Group, $F(2, 61) = 2.652$, *p* < .0786, a

main effect for Time, $F(2, 61) = 72.332$, $p < .0001$ and an interaction between Group and Time, $F(4, 122) = 8.495$, $p < .0001$. To determine the source of interaction, additional one-way ANOVAs were conducted and groups were compared at each posttest time.

A series of one-way ANOVAs on the posttests revealed a main effect for Group on the first posttest, $F(2, 61) = 7.011$, $p < .0018$ but no main effect for Group on the second posttest, $F(2, 61) = 2,206$ $p < .1188$. Post-hoc Scheffe tests revealed the following contrasts at posttest 1: MOI is same as PI ($p < .3802$), PI is same as Control ($p < .1061$), and MOI is better than Control ($p < .0019$). Post-hoc Scheffe tests conducted on posttest 2 revealed: PI is same as MOI ($p < .1485$), PI is same as Control ($p < .8849$), and MOI is same as Control ($p < .3113$). A series of paired *t*-tests was also conducted to observe how each group performed independently. For the PI group, the analysis indicated that posttest 1 is better than pretest ($t = -7.561$, $p < .0001$), posttest 2 is better than pretest ($t = -5.064$, $p < .0001$), and posttest 1 is better than posttest 2 ($t = 4.313$, $p < .0004$). For the MOI group, the analysis showed that posttest 1 is better than pretest ($t = -7.616$, $p < .0001$), posttest 2 is better than pretest (t = -6.292, p $< .0001$), and posttest 1 is better than posttest 2 ($t = 2.705$, $p < .0129$). The analysis of the Control group revealed that posttest 1 is better than pretest ($t = -2.425$, $p < .0244$), posttest 2 is better than pretest ($t = -3.914$, $p < .0008$), and posttest 1 is same as posttest 2 ($t = -.470$, $p < .6435$).

To summarize, the interpretation data suggest that both PI and MOI groups appear to have some type of knowledge gain. It might be said that both PI and MOI had a positive effect on how learners interpreted the English present subjunctive form. The effects of both PI and MOI were not completely retained over time and both showed a significant decline. However, these conclusions are attenuated by the fact that the Control group made significant gains without any kind of treatment. Because the Control group improved, it is hard to claim that the improvement made by the PI and MOI groups is due to their respective treatments. Figure 1 shows the interaction plot for instruction type and time on the interpretation task.
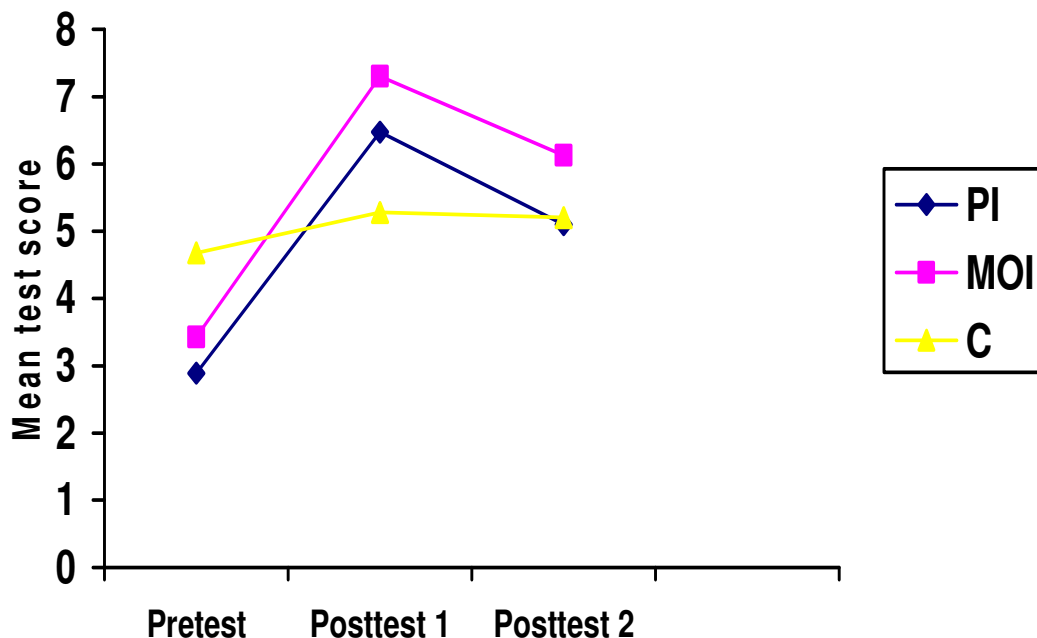
Figure 1. Interaction plot for instruction type and time using interpretation data means

Production Task

Table 3
Production Data: Means and Standard Deviations for All Groups

	Group					
	PI (n = 19)		MOI (n = 23)		Control (n = 22)	
	M	SD	M	SD	M	SD
Pretest	.895	1.049	.913	.996	1.500	1.371
Posttest 1	5.474	2.951	8.217	1.650	1.409	1.333
Posttest 2	3.474	3.186	6.565	2.982	.818	.853

range = 0-10

Mean scores and standard deviations for all groups appear in Table 3. A repeated measures ANOVA was performed on the sentence-level production data (see Table 5) with Group (PI, MOI, Control) as the main independent variable and Time (pretest, posttest 1, posttest 2) as the repeated measure. The analysis yielded a main effect for Group, $F(2, 61) =$

47.247, $p < .0001$, a main effect for time, $F(2, 61) = 80.452$, $p < .0001$ and an interaction between Group and Time, $F(4, 122) = 29.247$, $p < .0001$. To determine the source of interaction, additional one-way ANOVAs were conducted and groups were compared at each posttest time.

A series of one-way ANOVAs on the posttests revealed a main effect for Group on the first posttest, $F(2, 61) = 63.143$, $p < .0001$ and a main effect for Group on the second posttest, $F(2, 61) = 28.856$, $p < .0001$. Posthoc Scheffe tests revealed the following contrasts on posttest 1: MOI is better than PI ($p < .0003$), PI is better than Control ($p < .0001$), and MOI is better than Control (p $< .0001$). Scheffe tests conducted on posttest 2 revealed similar contrasts: MOI is better than PI ($p < .0010$), PI is better than Control ($p < .0060$), and MOI is better than Control ($p < .0001$).

A series of paired *t*-tests was also conducted to examine how each group performed independently. For the PI group, the analysis revealed that posttest 1 is better than pretest ($t = -6.408$, $p < .0001$), posttest 2 is better than pretest ($t = -3.419$, $p < .0031$), and posttest 1 is better than posttest 2 ($t= 3.775$, $p < .0014$). For the MOI group, the analysis showed posttest 1 better than pretest ($t = -16.694$, $p < .0001$), posttest 2 better than pretest ($t = -8.627$, $p < .0001$), and posttest 1 better than posttest 2 ($t= 2.569$, $p < .0175$). The analysis of the Control group indicated that posttest 1 is same as pretest ($t = .227$, $p < .8223$), pretest is better than posttest 2 ($t = 2.017$, $p < .0566$), and posttest 1 is better than posttest 2 ($t = 2.270$, $p < .0339$).

The above analysis shows that the PI and MOI groups made significant gains on the sentence-level production task. However, the gains were not similar. On posttest 1 MOI group performed significantly better than the PI and Control groups, and PI gains were greater than the Control group. By the second posttest, there was some decline in the gains of both treatment groups, with the MOI scores being slightly higher than the PI scores. In both cases the difference between PI and MOI was statistically significant. The Control group did not seem to have made any gains.

To summarize, the results of the analysis of production data reveal that both PI and MOI had a positive effect on the how learners produced the English present subjunctive form. The effects of both PI and MOI showed some decline but were mostly retained over time, which means learners were still able to produce the target form a week after the instruction. The results also indicate that the Control group did not make any improvement on the production task. Figure 2 shows the interaction plot for instruction type and time on the sentence-level production task.
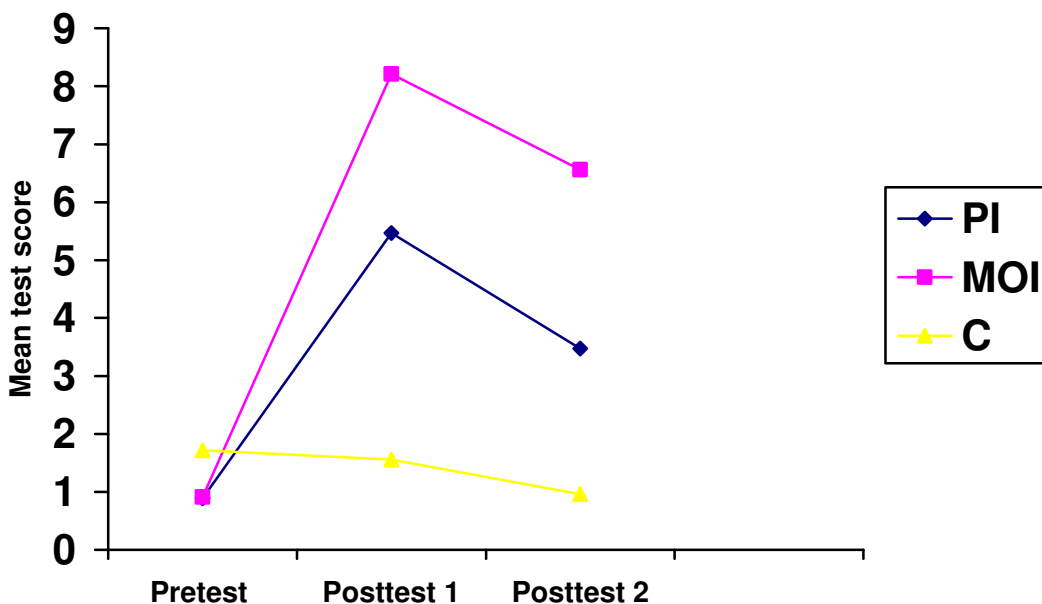
Figure 2. Interaction plot for instruction type and time using production data means

Overall Summary

In light of the findings in the present study, for RQ1 that asked whether PI and MOI would bring about improved performance on the *interpretation* task, the answer is yes and no. PI and MOI groups seemed to bring about improved performance on sentence-level tasks involving the interpretation of the English present subjunctive but the fact that the Control group also showed the same improvement as the treatment groups casts doubt as to whether the beneficial effects could be ascribed to the treatments. For RQ2, whether PI and MOI would bring about improved performance on the *production* task, it appears that both PI and MOI did bring about significant gains. Finally, for RQ3 that asked whether there is a significant difference between the effect PI and MOI causes on interpretation and production tasks, the answer is yes. The performance of the MOI group on the production task was significantly better than that of the PI group.

Discussion

This study resulted in mixed findings. Both PI and MOI groups seemed to perform better on the interpretation task but the fact that the Control group that did not receive any specific treatment on the target form also made significant gains on the interpretation task makes it hard to attribute the beneficial effects to the treatments that PI and MOI groups received. On the other hand, both PI and MOI groups improved significantly on the production tasks after treatment and their improved performance was largely sustained through the second posttest. Since the Control group did not make any progress on the production tasks, the beneficial effects can be ascribed to the PI and MOI treatments.

The fact that the Control group improved as much as the treatment groups on the interpretation tasks remains a mystery because the Control group did not receive any specific instruction on the English present subjunctive form and they did not have any knowledge about this form before the experiment. The reason for the improvement might have been due to the level of English proficiency that specific group of participants had, or some sort of test-taking strategy they made use of on the interpretation tasks. The improvement could not be attributed to any prior knowledge that the participants in the Control group had since if that had been the case, those participants would have showed, at minimum, some improvement on the production tasks.

That the MOI group showed some improvement after treatment on the production tasks might have been due to learner output being utilized as input (incidental input) for other learners. That is to say, when a student responded to an activity item during the follow-up stage, the student's answer might have served as incidental input for those who were listening. Therefore, incidental input might have had some effect on learners' abilities to produce the English present subjunctive form. Moreover, the improvement of the MOI group on the production task was to be expected, since during the treatment period the students in this group had performed production-oriented tasks of a similar nature to the production assessment test. The production assessment tests were not oral or spontaneous in nature, but they enabled learners to monitor their responses and give their answers in written form. Furthermore, MOI treatment activities only included English present subjunctive items; that is, the activities required learners to produce only subjunctive form, as opposed to the activities in the PI treatment in which participants also worked with indicative items. Thus, this variance between the PI and MOI treatments may have been at least partially responsible for the improved performance of the MOI group on the production task.

In the present study, the results of the interpretation task reveal no significant difference in improvement after treatment between the PI group and the MOI group. This means that participants in both PI and MOI groups had similar gains in their ability to interpret the English present subjunctive. Although the Control group did not receive any treatment on the target form, they improved to the same extent as the PI and MOI groups.

The results of the production task revealed a significant difference in improvement between the PI group and the MOI group after treatment. This means that participants in the MOI group improved to significantly greater degree in their ability to produce the English present subjunctive form as compared to those in the PI group. The Control group did not improve at all on any of the productions tasks from pretest to second posttest. Therefore, instruction type appears to have had a significant effect on learners' performance on the assessment tasks involving the production of the English present subjunctive form, and MOI seems to have better positive impact on learners' ability to produce the English present subjunctive form.

The discussion now needs to be directed towards why the PI group and the MOI group in the present study performed similarly on the interpretation level but differed significantly on the production level compared to previous studies investigating the effects of PI with output-oriented instruction. One possible explanation may be attributed to the type of output-based instruction labelled as MOI in the present study. In contrast to 'traditional' instruction used in

studies such as VanPatten & Cadierno (1993), Cadierno (1995), and Cheng (1995), the output-centered treatment MOI had no mechanical component. There was no traditional practice of form or movement from more mechanical to more meaningful drills. The MOI activities used in the present experiment pushed the participants to express opinions and beliefs using the English present subjunctive form. In previous studies on the effects of processing instruction, the traditional groups were involved in activities in which they moved from mechanical to meaning-based exercises. The fact that MOI has a more meaningful component may have been the contributing factor for the more improved performance of the MOI group than that of the PI group in the present study.

A number of limitations also need to be discussed regarding the present study. One of them is the subject pool. The participants in the present study were all upper-intermediate English learners enrolled in the English language program of the same university. Apart from the various levels of exposure of English they had at high school, the level of formal instruction in English that the participants received was similar. Therefore, this study cannot account for what effects PI and MOI might have on English learners who come from a significantly different background and have different amount of exposure to English. Furthermore, the present study had a methodological limitation. This limitation concerns the way assessment tasks and treatment tasks were prepared and delivered. Both of the interpretation and production assessment and treatment tasks did not reflect natural language use and all of them were based on written items. Due to time constraints and lack of efficient measures to test one-on-one oral performance of the participants, no oral activities were included in this study. Therefore, it cannot be concluded from this study that PI and MOI would result in improved performance during spontaneous spoken production. Also, the MOI treatment included only the practice of subjunctive items whereas the PI group practiced both indicative and subjunctive items. Therefore, further research with more efficient assessment tools is needed to investigate the effects of both PI and MOI. Another limitation was concerned with the duration of the assessment of instructional effects. The duration of the long-term effects measured in the present study was only a week period. Thus, the longer-term effects remain to be assessed. Since the participants were already upper-intermediate learners of English and they would soon receive instruction on the English present subjunctive form in their regular class curriculum, there was no time for additional extended posttests. Another methodological limitation regarding the design of this study has to do with ruling out the effects of explicit information component of the treatments for both instructional groups. It might be argued that the gains both groups had at the interpretation and production levels could have resulted from the explicit information. Explicit information must have definitely helped the participants become familiar with the target structure as to how it looks and where in the sentence it appears. However, the improved performance on both immediate and delayed assessment tasks could not only be attributed to the explicit information. Even though we might assert that the explicit information might have enabled participants to interpret the items on the interpretation tasks, the improved performance at the production level could have only resulted from the production practice both treatment groups had with PI and MOI activities.

Conclusion

The results of the present study stress the important roles of structured input and output in second language acquisition and the advantages of processing instruction and meaning-

based output instruction. Through structured input, learners are pushed to attend to input to make form-meaning connections, and therefore internalize the formal properties in the L2 in question. Similarly, structured output, as used in the MOI treatment, provides meaningful and focused incidental input which supposedly helps learners access intake to produce language involving the L2 forms. In a sense, both PI and MOI instruction provide learners with more input which may cause stronger form-meaning connections and result in better acquisition.

Further research is needed to separate out the effects of incidental input in the MOI treatment. During the MOI treatment student responses to the activities provided incidental input for the others in the classroom and this may have helped them process the target form. One way to eliminate the incidental input in MOI is by conducting an experiment in which instruction is delivered via a computer software. In so doing, output practice could be done by writing and/or speaking into a computer and recorded. Therefore, each participant can be isolated in this way and the incidental input variable could be eliminated. An experiment of this kind would reveal the actual impacts of MOI on the acquisition of the English present subjunctive form or other L2 forms.

From the pedagogical perspective, the results of the present study have some implications for second language instruction. Given the benefits that both PI and MOI brought about in the present experiment, both instruction types might be incorporated into a curriculum. PI is entirely input-based and can be presented in both written and aural form. It can be delivered via interactive web-based materials such as online workbooks, podcasts, multimedia programs, and etc. MOI, on the other hand, may serve best when integrated into in-class activities in which students exchange new information in spoken or written form with others. To sum up, the results of this study support the idea that each instruction type has its own functional benefits in and out of the classroom for learners, and together these can serve as complementary tools for second language teachers.

Biographical information

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Appendix 1

Sample Assessment Items

Sample Interpretation Task Items: Read each situation and choose the option that best completes each statement.

John has to sit for a Physics test at school tomorrow. He has already reviewed most of what he needs to but still has more material to go through. However, he is a big fan of soccer, and his favorite team has a qualification game tonight.

1) ....he continue doing his review for the test.

a) I recommend that...
b) I suppose that...
c) I think that...
d) I hope that...

George signed a twelve-month lease in downtown Chicago five months ago. He recently found a job that pays more in New York City and wants to take the job. He has to move there in a month, so he needs to either sublet his place in Chicago or keep paying the remaining rent.

2) ....George pay the rest of the rent on his lease if he can't find a person to rent his apartment.

a) It is unfortunate that...
b) Eventually...
c) It is required that...
d) I believe that...

Sample Production Task Items: Follow the instructions below to form complete sentences.

Part1: Choose phrases from List B and match them with phrases on List A to form meaningful statements. Be sure to use the correct form of the verbs in parentheses in List B.

Trevor has had some health problems lately and needed to see a doctor. The doctor noted that Trevor had been eating unhealthily for a while and prescribed a healthy diet for him.

List-A

1) It is surprising that he..........

2) The doctor recommended that he..........

List-B

- (take) an hour-long walk every morning.

- (smoke) at least a packet of cigarettes every day.

Part 2: Below are some statements about friendship. Some of them refer to the characteristics of a true friendship, while others are about what a good friendship should be like. Choose one of the expressions in the box below and then complete each statement. Make sure to use the correct verb form for each sentence you complete. (Note that some expressions may apply to more than one statement, so feel free to use an expression more than once as long as your match makes a meaningful statement.)

to have similar interests	to be trustworthy	to meet frequently
to stay in touch	to reach compromises	

1) It is important that friends..........

2) Often, friends..........

3) I prefer that a good friend..........

Part 3: Complete each sentence according to the situation given below.

You are in final exam week and have been studying really hard. You have to get ready for the exam tomorrow, but your roommate keeps listening to loud music that prevents you from concentrating on your studies.

1) You request that he....

2) It seems that he...