# Comparing the Effectiveness of Processing Instruction and Output-based Instruction in Acquiring the BE copula

# การเปรียบเทียบประสิทธิผลของรูปแบบการสอนแบบประมวลผล และรูปแบบการสอนแบบการผลิตภาษาเป็นฐาน ในการสอนกริยา *BE copula*

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**บทคัดย่อ**

งานวิจัยก่อนหน้านี้พบว่าผลการเปรียบเทียบประสิทธิผลของรูปแบบการสอนแบบประมวลข้อมูลและรูปแบบการสอนแบบการเน้นผลิตภาษานั้นยังคงไม่แน่ชัด ซึ่งอาจเกิดเนื่องจากรูปแบบการสอนทั้งสองแบบส่งผลให้ผู้เรียนเกิดการสังเกตรูปแบบภาษาเหมือนกัน และอาจเนื่องจากผลจากการเลือกโครงสร้างภาษาที่นำมาทดลองที่เหมาะกับรูปแบบการสอนแบบใดแบบหนึ่งจึงทำให้เกิดผลวิจัยที่แตกต่างกัน ดังนั้นในงานวิจัยนี้จึงมีวัตถุประสงค์เพื่อเปรียบเทียบประสิทธิผลของรูปแบบการสอนแบบประมวลผลและรูปแบบการสอนแบบการผลิตภาษาเป็นฐานโดยการเลือกโครงสร้างภาษาที่เหมาะสมตามหลักการและทฤษฎีที่เกี่ยวข้องคือกริยา be copula + adjective predicative structure กลุ่มตัวอย่างในงานวิจัยนี้ประกอบด้วยผู้เรียนภาษาอังกฤษชาวไทยจำนวน 55 คน ซึ่งแบ่งเป็นกลุ่มที่สอนแบบประมวลผลจำนวน 20 คน กลุ่มที่สอนแบบการผลิตภาษาเป็นฐานจำนวน 20 คน และกลุ่มควบคุมจำนวน 15 คน ทั้งสามกลุ่มทำการทดสอบก่อนเรียนและหลังเรียน กลุ่มทดลองทั้งสองกลุ่มเรียนในรูปแบบที่แตกต่างกันตามที่จัดเตรียมไว้ ส่วนกลุ่มทดลองทำการทดสอบเพียงก่อนเรียน

และหลังเรียนโดยที่ไม่ได้มีการเรียนอื่น ผลวิจัยแสดงให้เห็นว่ารูปแบบการสอนทั้งสองแบบมีประสิทธิผลต่อการสอนที่ไม่แตกต่างกันทั้งด้านการพัฒนาความเข้าใจและความสามารถในการใช้กริยา be copular + adjective predicative structure ซึ่งผลวิจัยที่ได้จากงานวิจัยนี้บางส่วนสนับสนุนและบางส่วนขัดแย้งผลวิจัยก่อนหน้านี้

**คำสำคัญ**: รูปแบบการสอนแบบประมวลผล; การประมวลผล; รูปแบบการสอนแบบการผลิตภาษาเป็นฐาน

## Abstract

Previous studies on processing instruction have shown mixed results regarding its effectiveness when compared to output-based instruction. This could be due to how both types of instruction can lead to attention to form. Furthermore, the target structure may have favored one type of instruction but not the other. The current study compares the effectiveness of two types of instruction, namely, processing instruction and output-based instruction, on the acquisition of the English *be* copula + adjective predicative structure. Fifty-five Thai EFL learners were assigned to either a processing instruction group ($n$ = 20), output-based group ($n$ = 20), or control group ($n$ = 15). The processing instruction group and the output-based group were instructed under the two different conditions as mentioned, while the control group performed only the pre and posttests. Results revealed that output-based instruction and processing instruction were equally effective in improving learners comprehension and production of the *be* copula + adjective predicative structure. The results of the study confirm and contradict previous findings.

**Keywords:** processing instruction; input processing; output-based instruction

In the past decade, investigations into pedagogical grammar and classroom instruction have given rise to a methodology that has shown to be effective to facilitate acquisition of targeted structures. Processing instruction is a type of focus-on-form instruction that is designed to make learners attend to structures they would normally overlook during interactions with second language input (Lee &VanPatten, 2003; VanPatten, 1996, 2004, 2015). The technique has been argued to help learners process critical grammatical structures that are often ignored due to learners' natural input processing strategies. The intervention is based on Input Processing Model, which includes universal language processing principles (VanPatten, 2012, 2015). VanPatten suggests that language acquisition includes three processes: input processing, accommodation, and restructuring, while arguing that access and production is a reflection of what has already been acquired. The assumption of the Input Processing Model is that input is the most vital component of language acquisition, but not all input is successfully processed owing to learners' limited processing capacity. Accordingly, he put forth a set of principles that describe processing strategies that affect the degree in which linguistic input is attended to and is converted to intake.

The first principle states that learners are more sensitive to content words. Words that only have a grammatical function such as the auxiliary *do* in questions will not initially be processed. Although learners may notice the form in the question, the fact that they continue to leave the auxiliary *do* out when forming questions suggest its form-meaning connections have yet been made. The second principle is that lexical items will be processed for meaning before their grammatical forms that express the same meaning. For example, the word 'yesterday' and 'last night' will be processed before past tense markers on verbs (i.e., *-ed*) or their irregular form. This sets up the third principle which

states that learners are likely to process grammatical information that is non-redundant before redundant markers. The progressive *–ing* morpheme, for example, is suggested to be processed early because it is the only marker that informs the listener that an action is ongoing. On the other hand, the present simple *–s* morpheme inserted after verbs when the subject is a third-person singular noun is often not processed because its information is redundant with the subject itself. That is, the morpheme *–s* repeats that same information that the subject does. This observation is perhaps one reason why the *–s* is one of the last morpheme to be acquired despite its frequency and early introduction to students. Therefore, more meaningful and non-redundant markers are suggested to be acquired earlier.The final relevant principle is the L1 Transfer Principle which states that learners process the L2 using their L1 parsing methods. For example, Thai learners of English may not process the *be* copula in an adjective predicate structure because it does not exist in the Thai syntactic structure. These principles have been supported empirically (see Houston, 1997; Lee, 1987; Malovrh, 2006; Tight, 2012; VanPatten & Houston, 1998; Marsden, 2006) and have also been challenged (see Dekeyser & Botana, 2014; Dekeyser, Salaberry, Robinson, & Harrington, 2002). Regardless, the principles have been applied to a teaching model named processing instruction and in the past decade processing instruction has been compared with other traditional methods of L2 teaching.

## Previous Processing Instruction Studies

A number of research studies found processing instruction to be more effective than traditional instruction (i.e., defined as rule based learning and rote production) in terms of developing L2 learners' linguistic competence as measured by interpretation and production tasks (e.g., Benati, 2001; Cadierno,

1995; Dekeyser & Botana, 2014; VanPatten & Cadierno, 1993; VanPatten & Oikkenon, 1996). However, there have also been research studies that have contradicted those earlier findings(e.g., Allen, 2000; Dekeyser & Solkalski, 2001; Farley, 2004; Morgan-Short & Bowden, 2006). In general, processing instruction seems to dominate traditional instruction by helping learners develop interpretation skills for certain grammatical forms. This is expected since traditional or output-oriented instruction group did not receive interpretation practice. What is intriguing was that learners in the processing instruction group demonstrated relatively equal gains on the production task despite not being given practice on production. For example, VanPatten and Cadierno (1993) investigated whether processing instruction could alter how learners process input and whether it would affect learners' comprehension and production. Eighty English learners of Spanish were separated into three groups: processing instruction ($n$ = 27), traditional instruction ($n$ = 26), and control ($n$ = 27). Results revealed that the processing instruction group scored significantly higher than the traditional instruction and control group on the interpretation test. In the production test, the processing instruction group and the traditional group showed significant gains on the production posttests, but no difference between the two groups was found. Subsequent studies found similar results to VanPatten and Cadierno (e.g., Benati, 2001; Cadierno, 1995; Farley, 2001). That is, processing instruction often outperformed traditional output-based instruction in interpretation tasks while performing equally well on production tasks.

What is uncertain is the effectiveness of processing instruction when compared to output practice that contains a meaningful element. Previous studies have shown mix results. Benati (2005) and Farley (2001), for example, found that learners in the processing instruction group outperformed learners

in the meaning-based output instruction on the interpretation task and performed equally well on the production task. Other studies, however, have argued that not all studies that claim to use meaning-based output activities are actually meaningful. Farley (2004) and Morgan-Short and Bowden (2006) argue that output-based practice in VanPatten and Cadierno's study was not absolutely meaningful and this instead could have caused divergence in learners' development. Farley compared the effectiveness of processing instruction with meaning-based output instruction. Fifty-two undergraduate students were split into the processing instruction group and the meaning-based output group. Results revealed initial and sustained improvements for both instructional groups. No differences in the gains between the two groups were found. This indicates the efficacy of both types of instructions for acquiring the Spanish subjunctive. The study, thus, supports the effectiveness of processing instruction, andthebenefits of meaning-based output activities. Similarly, Morgan and Bowden (2006) compared the effectiveness of processing and meaningful output-based instruction. Learners were assigned toa processing instruction ($n$ = 15), meaningful output-based instruction ($n$ = 15), and control group ($n$ = 15). The target structure was Spanish preverbal direct object pronounsand the underlying principle was *the First Noun Principle*. Overall results revealed significant gains for both the processing instruction and meaningful output-based instruction groups in the immediate and delayed posttest but no gain for the control group. An analysis of the interpretation test showed no difference in performance between the two experimental groups. The results from the production test revealed that the meaningful output-based group outperformed the processing instruction and the control groups in the immediate posttest.

Conflicting results in processing instruction studies may be due to two possiblevariables. The first involves meaningful practice. It should be noted that both processing instruction and meaningful output-based instruction could lead to linguistic development when practice was meaningful. In addition, meaningful output-based instruction seemed to have provided an advantage regarding production. The advantage of meaningful output practice may best be explained by the output hypothesis (Swain, 1985, 1993). Swain proposed the *comprehensible output hypothesis*, which states that learner output makes learners focus on lexical items, grammatical rules or syntactical structures. To acquire a language, learners need opportunities to produce *pushed* output. Swain's hypothesis concerning comprehensible output has been supported by a number of empirical studies (e.g., Izumi & Izumi, 2004; Nagata, 1998; McDonough, 2005; Swain & Lapkin, 1998). As such, providing opportunities to produce meaningful output in output-based instruction, learners performed equally well, if not better than, learners instructed in processing instruction.

The second variable is related to the target structure. According to Dekeyser and Solkalski (2001), the effectiveness of input practice was due to the particular target structure tested and the quality differences of the treatments. They argued that the Spanish direct object clitic was easy to produce but difficult to perceive. Thus, students in the input practice group received practice in the difficult aspect of acquiring the structure and the output practice group received practice in the easier aspect. Subsequently, the input group performed equally well on the production test because it was relatively easy to learn. Collentine (1998) and Allen (2000) similarly argued that certain structures could have been more appropriate for output-based instruction and processing instruction. Collentine compared the effects of processing instruction ($n$ = 18), output-oriented instruction ($n$ = 18), and control group ($n$ = 18) on learning the

Spanish subjunctive. Results from a picture interpretation and sentence completion posttests revealed significant gains for both experimental groups but no difference between them. Allen (2000) replicated VanPatten and Cadierno's (2003) study but switched the target to French causatives. He suggested that processing instruction may be effective for certain grammatical features and that future studies should investigate other features to determine the usefulness of processing instruction in second language classrooms.

To conclude, previous studies that compare processing instruction to output based instruction have shown conflicting results. It has been argued that the superiority of processing instruction over output based instruction in certain studies is due to structural bias and non-meaningful output-based instruction. The current study thus aims to investigate these issues further. The purpose of this study is to compare the effectiveness of processing instruction with meaningful output-based instruction. The target structure investigated is the *be* copula + adjective predicative. Processing difficulty of the *be* copula in this structure is related to *The Meaning-Before-Non-meaning Principle* as learners may not process it because it carries or adds no meaning to the message. Therefore, this study separates itself from previous studies because it investigates a structure (i.e., English *be* copula adjective predicative) and L2 learners (i.e., Thai EFL) that have not yet been studied in previous processing instruction comparative studies.

## Research Questions

This study was guided by the following three research questions:

1. Do learners who receive processing instruction and meaningful output-based instruction improve on interpretation and production tasks of the *be* copula + adjective predicative structure?

2. Do learners who receive processing instruction perform better on interpretation tasks than learners who receive meaningful output–based instruction?

3. Do learners who receive processing instruction perform better on production tasks than meaningful output-based instruction?

## Method

*Participants*

Participants initially included 103Thai EFL first year undergraduate students studying at a large public university in the northeastern region of Thailand. All students had at least eight years of English training in formal classroom instruction. They were in the second semester when the study began and came from a variety of disciplines (i.e., engineering, hotel and tourism, and humanities and social sciences). The participants were assigned into the control group ($n$ = 31), processing instruction group ($n$ = 35), and meaningful output based instruction group ($n$ = 35). All were intact classrooms. Participants whose scores were higher than 60% andparticipants who completed only one of the tests were excluded from the rest of the analysis. This resulted in a final pool of 15 participants in the control group, 20 in the processing instruction group, and 20 in the meaningful output-based instruction group.

*Target Structure*

The target structure for this study was the *be* copula followed by adjective predicative. This target structure was selected because it fits well with the *Meaningful before Non-Meaningful Principle* and *The L1 Transfer Principle* in the Input Processing Model. That is, the be copula, when used as the main verb before an adjective in a subject predicative structure (e.g., The news *is* very important) does not add any meaning. It simply fulfills the grammatical role of main verb in the sentence. Previous studies have found that the be copula is somewhat problematic and often omitted by EFL learners (Yahya Ali Mufah & Eng, 2011; Unlu & Hatipoglu, 2012). Additionally, Thai language does not make use of a copula or any kind of linking verb between the subject and adjective in subject predicative structures making it a potential source of error (Iwasaki &Ingkaphirom, 2005).Consequently, there is a likelihood that learners would not attend to the *be* copula.Furthermore, the structure should be conducive to both interpretation and production tasks. That is, the structure does not appear to be biased to interpretation or production. Finally, it has not been investigated in previous processing instruction studies. The adjectives in this study were selected from the Brown corpus in conjunction with *Longman Student Grammar of Spoken and Written English* (Biber, Conrad, & Leech, 2002). The adjectives were identified as words in the 2000 level and the academic word list in the Brown corpus. The *Longman Student Grammar of Spoken and Written English* identified these adjectives as frequently used in a subject predicate position.

*Teaching Materials*

Teaching materials used in this study were learning tasks and an explanation sheet.

*Learning tasks*.Two types of learning tasksweredesigned for this study, the structured input activities and meaningful output based activities. The structured input activities were designed according to specific guidelines for developing structured input activities for processing instruction (Lee & VanPatten, 2003). First, the activities introduced one point at a time. In activity one, the items were designed to make learners focus only on the forms of the *be* copula while in activity two, they were designed to make learners focus primarily on the meaning of adjectives. Second, meaning was kept in focus. In each activity, the items forced learners to attend to the meaning as well as the form. Third, the practice moved from sentences to connected discourse. In activity four, learners had to listen to a short narrative and answer multiple choice comprehension questions. Each question was related to the information provided by the target structure. For example, one question asks “How did Tony feel about visiting Thailand for the first time?” and learners had to choose between “He was really excited” and “He wasn’t really excited”. Accordingly, they had to focus on listening to the *be* copula to answer this question correctly. The forth guideline was to use both written and oral input. Activities one to three provided written input and activity four provided oral input. Furthermore, the teacher was asked to read the answers out loud after each activity, which provided more oral input. The fifth guideline was to have the learner do something with the input. In activity one, learners were asked to read the statements and choose true or false based on their knowledge of Thailand. In activity four, they were asked to answer comprehension questions. The last guideline was to keep learner’s processing strategies in mind. In this study, previous practice showed

that learners regularly dropped the *be* copula in subject predicative structures (i.e., The beaches beautiful). The drop could be related to *The Meaning-before-Non-Meaning Principle*. The Thai language makes no use of a copular in this type of syntactic structure and probably added no meaning for Thai users. Accordingly, activities one and three are designed to alter learners' processing strategies by having them focus on the *be* copula in subject predicative structures. For example, in activity three, they were asked to read statements and decide whether they agree or do not agree with them. Therefore, they have to focus on the copular be, as well as the rest of the clause, for negative (e.g., isn't) or affirmative interpretations (e.g., is).

The meaningful output-based materials are parallel with the structured input activities, but the items are adapted so learners produce the structure as opposed to merely attending to it. As such, both teaching materials are matched for number of words, vocabulary, and syntactic complexity. This design is similar to Farley (2001). The materials were designed to make learners attend to the form and meaning of the message while constructing it through writing. For example, in activity one, learners were asked to use the appropriate form of the *be* copula to complete a sentence. Later they were asked whether the statements were true or false. Accordingly, it was assumed that learners would need to access their knowledge of the *be* copula form and meaning of the following adjective to complete the tasks. This is in line with what is referred to as *pushed output* (Swain, 1993). Producing language may force learners to search their own linguistic knowledge by identifying their gap and paying attention to relevant input. In activities two, three, and four, learners are forced to use the subject + *be* + adjective and the dummy *it* + *be* + adjective structure when writing their answers. Although learners were repeating this structure, it is not completely rote because they had to attend to the meanings of different

adjectives and also whether to use a negative or an affirmative structure. For example, in activity three learners were given the prompt "to wear shoes inside the house" and were provided a number of adjectives such as common and able. They were then asked to complete this sentence using the appropriate structure, adjective, and whether to make it an affirmative or negative statement (e.g., It's not appropriate to wear shoes inside the house).

*Explanation sheet*. The explanation sheet consisted of the explanation of the form and use of *be* copula and subject predicative structure. The grammatical explanation is written in Thai and also provides a contrast of the non-use of the *be* copula in the subject predicative structure. In addition, the sheet provides a list of common adjectives that is used with this structure. This grammatical explanation sheet is given to both structured input instruction and meaningful output-based instruction group.

All teaching materials were piloted with 11 undergraduate Thai EFL learners at a public university in the northeastern region of Thailand, who were not included in the main analysis. An English teacher at the corresponding university assisted with the piloting. Learners were asked to read the materials and follow the exercises. Later, they were asked to write down comments about the materials on the sheets such as what they found unclear. A Thai English teacher also examined the materials and wrote comments about them. The comments were noted and materials were adjusted accordingly.

### Pre- and Post-test

The test was designed according to a table of specifications to measure both comprehension and production of the copular *be* subject predicative structure. Ten items measured production and twelve measure comprehension. Five items were designed to measure listening comprehension and production.

Eight items were distracters. This came to a total of 35 items. The instruction for each section of the test was in Thai. The production items were similar to the activities in the meaningful output-based materials (i.e., sentence completion) and the comprehension items were similar to the structured input activity (i.e., true or false). The task in the listening section was the same as the meaningful output-based material. Learners were required to write full sentences for their answers.

The test was piloted with 21 undergraduate Thai EFL learners at a large public university in the northeastern region of Thailand. Two English teachers at the corresponding university assisted with administering the test. Learners were given a copy of the test, each test contained three sections: 1) listening, 2) sentence completion, and 3) true or false, respectively. The narrative for the listening test was read by a native English speaker in a slower than normal rate and was read twice. Learners were given 40 minutes to complete the test. Learners' answers were typed, saved in a rich format text and sent to the primary investigator via e-mail. An item analysis was conducted adopting the Cronbach's alpha reliability test. This test showed a moderate correlation score of .73. To achieve a higher reliability score, items that had negative *D* values were deleted and the data were reanalyzed. The result showed a strong reliability score of .84 (see Table 2).

Table 2

*Descriptive Statistics of the Pilot Test*

| *N* | *K* | *Mean* | *S.D.* | Cronbach's alpha |
|---|---|---|---|---|
| 21 | 24 | 14.43 | 7.58 | .84 |

The comprehension section was left with eight items due to deletion. To stay in line with tables of specifications, target items that were deleted were fixed by using vocabulary that corresponded with the teaching materials. This should help ensure that learners' ability to do the test is related to the target structure and not vocabulary factors.

*Scoring*

In part one and two, partial scoring was used. Performances in these two parts were scored for meaning and form. One point was given for correct meaning and one point was given for correct form. If the copular *be* was not used, no points were given. If the *be* copula form did not agree with the subject 0.5 points was deducted from the form point. In part three, items were score as either correct of incorrect with one point for correct choice and zero points for incorrect choice.

### Data Collection Procedures

The procedures included four phases: training instructors, pretest, implementing the interventions, and posttest. Three teachers agreed to participate in this study. Two teachers volunteered to lead the treatment groups, one to the processing instruction group, and one to the meaningful output-based nstruction group, and the other assisted in the control group. The participating teachers who volunteered to lead the experimental groups were given a lesson plan and training. The lesson plan included a brief explanation about the theoretical underpinnings related to their instruction type (i.e., input processing or meaningful output-based instruction) and step by step instructions about how to conduct each lesson. The researcher and the participating teachers went through the lesson plan together and the researcher answered any questions the teachers had. The training lasted approximately 30 minutes. The participating teachers from the control group received no training. They were assigned only to provide the pre-and posttests.

The pretest was administered by the participating teachers and was conducted outside class hours. Each group took the test independently. The teacher read the instructions in Thai and gave students the opportunity to ask questions. He still also answered any questions from the students. The test lasted 40 minutes.

The treatment for each respective experimental group was given seven days after the pretest. During the instruction, the participants were given a handout about the structure and function of the copular *be* in adjective predicative sentences. The teacher went through this handout with the learners and answered any questions from the students. This stage was identical for

both treatment groups. Following the explanation, the processing instruction group was given referential practice. At no time, were the learners in this group asked to produce the structure. The meaningful output-based group was given output-based practice.

The posttest was given immediately after the treatment by the participating teachers. The learners were given 40 minutes to complete the test.

### Data Analysis

The participants whose scores on the pretest were above 60% were excluded from the rest of the analysis. Previous studies have used 30% to 70% for screening participants, so this study used an in-between criterion in order not to be too conservative or liberal. The RQ1 aims to track learners' improvement in two task types (i.e., interpretation and production tasks) after processing instruction and output-based instruction. To answer this research question, a doubly-multivariate analysis was conducted individually for each group to compare the participants' mean scores of the pretest and posttest. The significant finding between the pretest and the posttest reveal learners' improvement of their knowledge in the copular *be*. To answer the RQs 2 and 3, aMultivariate Analysis of Covariance (MANCOVA) was used to compare the posttest scores of the three research groups. The independent variables were the type of instruction with three levels: input processing instruction, meaningful output-based instruction, and no instruction. The dependent variables were the interpretation task and the production task posttest scores. The covariants were the interpretation and production task pretest scores. This statistical measure was selected because it allows a control for differences in the pretest between groups making the results from the posttest comparable (Tabachnick & Fidell,

2007). When the significant main effect is found, pairwise comparisons using Bonferroni procedures to protect Type I error are performed to identify significant pairs (i.e., different teaching methods).

## Results

The purpose of this study was to investigate the effectiveness of processing instruction and meaningful output-based instruction on the acquisition of the copular *be*+ adjective predicative structure. This section is organized to answer the research questions.

To answer the RQ1 "*Do learners who receive processing instruction and meaningful output-based instruction improve on interpretation and production tasks of the be copula + adjective predicative structure?"* A doubly multivariate analysis was conducted for each group to determine whether there were any significant gains from the pretest to the posttest (see Table 3 for pretest and posttest mean scores). The results showed that all three groups showed significant improvement on the posttest: processing instruction, $F(2, 18) = 224.97$, $p<.05$, $\eta^2 = .96$, meaningful output-based instruction, $F(2, 18) = 123.32$, $p<.05$, $\eta^2 = .93$, and control group $F(2, 13) = 3.86$, $p<.05$, $\eta^2 = .37$ (see Table 4).The two treatment groups showed significant gains in both interpretation and production tasks. The control group improved only in the comprehension task.

Table 3.

*Means and Standard Deviations of the Pretest and Posttest scores*

| Group | *n* | Interpretation task | | | | Production task | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Pretest | | Posttest | | Pre | | Posttest | |
| | | *M* | *S* | *M* | *S* | *M* | *S* | *M* | *S* |
| PI | 20 | 7.75 | 2.12 | 10.5 | 1.7 | 4.95 | 4.20 | 20.88 | 2.62 |
| MOI | 20 | 7.75 | 2.17 | 9.4 | 1.98 | 7.10 | 4.98 | 20.53 | 4.12 |
| Control | 15 | 8.53 | 1.77 | 10.07 | .96 | 9.30 | 3.47 | 10.63 | 4.37 |

PI = processing instruction, MOI = Meaningful output-based instruction

Table 4

*Results from Doubly-Multivariate Analyses*

| Group | Hypothesis *df* | Error *df* | *F* | Sig | $\eta^2$ |
|---|---|---|---|---|---|
| PI | 2 | 18 | 224.97 | .000 | .96 |
| MOI | 2 | 18 | 123.32 | .000 | .93 |
| Control | 2 | 13 | 3.23 | .048 | .37 |

To answer the RQ2 *"Do learners who receive processing instruction perform better on interpretation tasks than learners who receive meaningful output–based instruction?"* and the RQ3*"Do learners who receive processing instruction perform better on production tasks than meaningful output-based instruction?"* A Multivariate Analysis of Covariance (MANCOVA) was used to analyze the data. Prior to the main analysis, a multivariate analysis of variance (MANOVA) was used to compare the participants' pretest scores. The result showed no significant differences among the three groups, $F(4, 102) = 2.37$, $p > .05$. This indicates that the participants were comparable in their knowledge of the use of the *be* copula + adjective predicative structure prior to the treatments. To compare learners' knowledge after the instruction, a multivariate analysis of covariance (MANCOVA) was performed; pretest scores were included in the model as covariate variables to adjust dependent variables for more powerful comparisons (Tabachnick & Fidell, 2007). The basic assumptions of MANCOVA representing by BOX's M test of Equality of Covariance Matrices and Bartlett's test of Sphericity were met $p(.017) > \alpha$ (.001) and $p(.000) < \alpha$ (.001), respectively). The results showed that the production pretest scores was a significant and reliable covariate and had effects on the comparisons of the posttest scores among the three groups, $F(2,49) = 6.37$, $p < .05$, $\eta^2 = .21$. The results for the MANCOVA indicated a significant main effect for group, $F(4, 98) = 23.10$, $p < .05$, $\eta^2 = .49$ after being adjusted for covariate scores. Accordingly, pairwise comparisons were analyzed (see Table 5).

Table 5.

*Pairwise comparison of interpretation task and production task posttest score bygroup*

| | | | Adjusted Mean Difference (Effect Sizes are indicated in parentheses) | | | |
|---|---|---|---|---|---|---|
| | | Mean | Adjusted Mean | 1 | 2 | 3 |
| Production task | | | | | | |
| Group | *N* | | | | | |
| PI | 20 | 20.88 | 21.62 | 0.00 | | |
| MOI | 20 | 20.53 | 20.50 | 1.12 | 0.00 | |
| Control | 15 | 10.63 | 9.68 | 11.94* (3.71) | 10.82* (6.57) | 0.00 |
| Interpretation task | | | | | | |
| PI | 20 | 10.50 | 10.61 | 0.00 | | |
| MOI | 20 | 9.4 | 9.37 | 1.25 | 0.00 | |
| Control | 15 | 10.07 | 9.96 | 0.65 | 0.59 | 0.00 |

$p < .025$*

Follow-up tests were conducted to evaluate pairwise differences among the adjusted means for the production task and interpretation task. The Bonferroni procedure was used to control for Type I error across all comparisons ($\acute{\alpha}$ = .05/2 = .025).

Results from the production task analysis indicated that learners in the meaningful output-based instruction (*M* = 20.53) and the input processing instruction (*M* = 20.88) groups performed significantly better than the control group (*M* = 10.63) (mean difference = 10.82 and 11.94, *ES* = 3.71 and 3.57, respectively) (see Table 5). However, the treatment groups were not significantly different from each other (mean difference = 1.12). Results from the interpretation task showed no significant differences among the three groups.

## Discussion

The purpose of this study was to compare the effectiveness between processing instruction and meaningful output-based instruction on the acquisition of the *be* copula + adjective predicative structure. Previous studies have found conflicting results in terms of the comparison between processing instruction and output-based instruction. There have been studies that found that processing instruction was more effective (e.g., Benati, 2001; Cadierno, 1995; VanPatten & Cadierno, 1993; VanPatten & Oikkenon, 1996) and studies that have found that output-based instruction was as equally effective as processing instruction because (a) the practice was meaningful (e.g., Farley, 2004; Morgan-Short & Bowden, 2006) and (b) the structure rendered itself to output practice (e.g., Allen, 2000; Dekeyser & Solkalski, 2001). The present study was particularly interesting because previous ones had not yet tested both types of instruction with the English *be* copula + adjective predicative structure and with Thai EFL learners.

Results revealed that the learners from both the processing instruction and meaningful output-based instruction were able to perform equally well on the interpretation task. This finding diverges from a number of earlier studies which found that learners in the output-based instruction were not able to perform as well as learners in the processing instruction group on interpretation tasks (see Benati, 2001; Cardieno, 1995; Farley, 2001; VanPatten & Cadierno, 1993). One possible explanation for this study's finding is that the development could be related to the nature of the structure. Dekeyser and Solkalski (2001) argued that processing instruction may be suitable for structures that are difficult to interpret but easy to produce. As a result, learners would benefit more from interpretation practice on these types of structures because production would not be a difficult task. The *be* copula + adjective predicative structure is not a complex structure and is not biased to either interpretation or production tasks. As a result,the participants in the processing instruction and the output-based instruction groups were able to perform equally well.With no structural bias towards either interpretation or production tasks this type of structure can be learned equally effectively by either input-based or output-based instruction.

In addition, the results from this study indicate that learners do not need output practice to be able to produce the *be* copula + adjective predicative structure, while at the same time learners who learn by producing this structure can demonstrate the ability to interpret the structure even though they had no practice to do so. If the goal of grammatical instruction is to create linguistic competence, then both types of instruction can be successful in this task. A possible explanation to why both types of instruction were equally successful is that both aimed at providing meaningful practice on the target structure. During both types of practice, the learners were forced to make form-meaning

connections. This is in line with Farley (2004) and Morgan-Short and Bowden (2006) studies. Similar to this study, their studies focused on creating meaningful output-based practice. They found that learners in both processing instruction and meaningful output-based instruction were able to demonstrate gains in interpretation and production skills. This suggests that learners benefit from creating meaningful connections between the form and its meaning or function, and this can be achieved through either input-or output-based practice.

Regarding processing strategies, it can be suggested that both types of instruction lead to the same strategy, attention. VanPatten (2015) noted that noticing or attention was one of his premises (as well as limited working memory and the drive to communicate) for the Input Processing Model. Although one of the main goals of processing instruction is to alter learners' processing strategies, learners are at the same time forced to attend to the target form. With regards to output-based instruction, Swain's (1985, 1993) comprehensible output hypothesis suggests that when learners attempt to produce language, they may notice their knowledge gap and attend to relevant input. It is thus likely that learners were attending to the *be* copula + adjective predicative structure and making form-meaning connections while producing it. In short, it is suggested that learners from either group were using the same processing strategy to acquire the target form. The starting point may have been different but it led to the same state of attention resulting in form-meaning connections of the *be* copula in the adjective predicative clause.

The final point to be made here involves the fact that the control group showed gain in the interpretation task but not the production task. One possible explanation is that during the interpretation tasks learners may need not attend to the *be* copula. They could merely attend to the adjective and use their global knowledge to respond to the true false statement. This is reflected by the fact

that although learners performed at a high level on the interpretation task, they were unable to demonstrate it in their production task. This indicates that they have not yet truly acquired the *be* copula + adjective predicative form and function. The phenomenon might also demonstrate that with no focus on form instruction productive skills is less likely. As described in the previous passage, both types of instruction lead learners to make form-meaning connections. As a result, the connection that had been acquired could be accessed for production when needed. Accordingly, future studies should investigate the effects of focus on form instruction and productive skills with more complex structures.

### Limitations

The results from this study must be interpreted with caution due to a few limitations in the study. First of all, the number of participants is relatively low to be making any sort of generalization. The initial pool consisted of a large set of participants ($N$ = 103) but due to data screening and missing data from the posttest, the number of participants became relatively small ($n$ = 55). Secondly, because the groups were not randomly assigned and that learners were in an intact classroom, one could argue that other factors may have come into play regarding the results such as the proficiency level of learners, their teachers, or their disciplines. Finally, results may not be generalized beyond the structure and level of learners investigated.

### Future studies

First, future studies should try to test this structure with lower level of learners or learners with a different L1. This study did not take learners' L1 into account in the analysis. It would be interesting to examine how ESL/EFL learners from different L1 backgrounds would perform in this study. Second,

longer treatment periods should be given to learners. The current study only had one session of treatment, so it was unable to examine the long term effects. Semester long treatments have yet been investigated. It is thus interesting to see how effects of processing instruction and meaningful output-based instruction are compared in longer periods. Finally, it would also be interesting to investigate the effect of meaningful grammatical instruction further. This could be achieved by including a group that receive the same content but omitting meaningfulness in practice.

To conclude, the results from this study indicate that meaningful output-based instruction and processing instruction are equally advantageous for improving learners' comprehension and production skills, at least for this particular structure and level of learners. Therefore, learners should benefit from meaningful-based instruction, whether input-based or output-based. The notion of structural bias was also examined but the fact that both treatment groups performed well on both types of tasks indicated that the structure did not lend itself to a particular teaching method. Also, it is suggested that processing instruction and meaningful output-based instruction forces learners to attend to grammatical structure and make form-meaning connections. Finally, limitations of the study should be kept in mind when conducting future processing instruction studies.

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