

# An Overview of Processing Instruction and Traditional Instruction: Reexamining their Relevance in Second and Foreign Language Teaching and Learning.

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## Abstract

Traditional instruction (TI) has been the subject matter of second or foreign language teaching for centuries. It has been recently proven irrelevant to the benefit of processing instruction. Processing instruction (PI) has been recently introduced in the field of second or foreign language teaching. Yet, some studies have proven that TI is not negligible in second or foreign language teaching. With regards to this controversy, the current study deems necessary to reconsider by reexamining the benefit of the two teaching approaches (TI and PI) in foreign language teaching and learning. To better achieve this goal, 20 articles are randomly selected to further investigate and point out the relevance of both vis-a-vis the tasks involved. To be objective, this study investigates and compares the performance of participants with regards to the similar tasks involved in the two teaching approaches. Within the 20 articles 10 articles measure and discuss production and interpretation tasks. Hence, this study narrows the focus down to those 10 articles to assess the benefit of each teaching technique. Using the McNemar test, the current study reveals that there is no statistically significant difference between TI and PI for the production task because the chi-square value, which is  $1.8 < 3.84$  confirms the null hypothesis ( $H_0$ ). However, for the interpretation tasks, the chi-square value is  $9 > 3.84$ . This means that there is statistically a significant difference between PI and TI and therefore, PI outperformed TI. Yet, TI should not be ignored completely in second and foreign language teaching, it can be used when production tasks are involved even though PI remains more efficient in both tasks.

*Key words: Traditional instruction, processing instruction, production, interpretation, structured input*

## INTRODUCTION

Traditional instruction has been used in the field of second or foreign language teaching for centuries. It is also referred to as traditional teaching/instruction or audiolingualism (ALM) or “Atlas complex” as presented by Lee and VanPatten (2003). In this teaching context, the instructor is the authoritative figure who is supposed to transmit knowledge to students, referred to as receptive vessels. Students, here, are passive vessels as compared to the instructor who is the active body. In this teaching context, students expect much from the teacher. This teaching model is based on explicit instruction followed by mechanical drills, memorization of dialogues and practice of sentence patterns. This teaching approach has recently been proven irrelevant in second and foreign language teaching to the benefit of a

new teaching approach called processing instruction. Processing instruction has been recently used in the field of second and foreign language teaching as efficient and beneficial.

Processing instruction (PI) originated from the work of (VanPatten & Cadierno, 1993), which aims at providing an appropriate teaching method in foreign language teaching. It is concerned with the way learners process or manipulate the input exposed to them. Some studies support the relevance of processing instruction to the detriment of traditional instruction VanPatten & Cadierno (1993), VanPatten (1996), and VanPatten (2003). Yet, other studies argue that traditional instruction (TI) is not negligible in second and foreign language learning Fernandez (2008) and Farley (2003). With regards to this controversy, the current study seeks to investigate more research conducted on PI and TI for more input to help reconsider and reexamine the importance of each in second or foreign language teaching. Following that, the following research questions are formulated:

1. Why is TI believed not to be relevant in second and foreign language learning?
2. How could PI be beneficial in second and foreign language learning?

These research questions give rise to the following hypotheses:

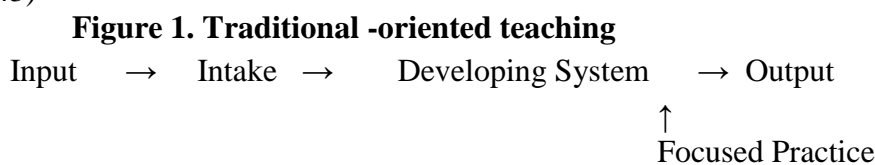
1. TI is believed to be irrelevant in second and foreign language learning.
2. PI is beneficial in second and foreign language learning.

Saying so, the current study aims at reconsidering and reexamining the benefit of PI and TI in second and foreign language learning. To do so, 20 articles have been randomly selected for analyses. These articles are further reduced to 10 articles which tackle PI and TI with respect to production and interpretation tasks. These articles are lowered down to 10 for objectivity reasons. First of all, although the 20 articles develop the two teaching approaches, they did not tackle the same tasks. They dealt with various tasks as elaborated in the tables below. In addition, the 10 articles are further selected to fit the current study since each of the 10 equally compared TI and PI vis-à-vis production and interpretation tasks.

## 1- Literature review

### 1.1.Traditional instruction

Traditional instruction is based on explanation and mechanical drills. In other words, in traditional instruction the input is exposed to learners via drills that learners take in and assimilate in their developing system before they are asked to produce output. This teaching approach is represented in the figure below as taken from Lee and VanPatten (2003, p. 133-143)



This teaching model has been used for centuries and was believed to be relevant until new studies disproved its relevance to the benefit of processing instruction VanPatten & Cadierno (1993), Cadierno (1995), Cheng (1995), Buck (2000), VanPatten and Wong, Benati (2001), Farley (2001a), VanPatten and Wong (2003), Farley (2003).

Fernandez (2008), for instance, reexamined the role of explicit information in processing instruction. His motivation is to double check whether EI is or not beneficial to L2 learners since most studies, including the previous ones demonstrate that EI is not necessary to processing instruction. Or maybe EI contribute to L2 learning in a way that cannot be measured by traditional pretest and posttest designs. The author conducted two experiments in this regard. The participants were randomly divided in two groups: 42 for the PI group and 42 for the SI group. Each participant had headphones and is taught individually through a computer program. Although in the first experiment, the benefit of the explicit instruction (EI) (also referred to as traditional instruction) is rejected to the benefit of processing instruction,

in experiment II, where the participants are tested on the third person singular present subjunctive, the findings support the benefit of EI since EI group outperformed the group which did not benefit from it.

In the same vein, the work of Farley (2003) further supports that EI by extension TI is not negligible in second or foreign language teaching since the participants who were tested on subjunctive task show gains. In most studies, traditional instruction has been compared to processing instruction.

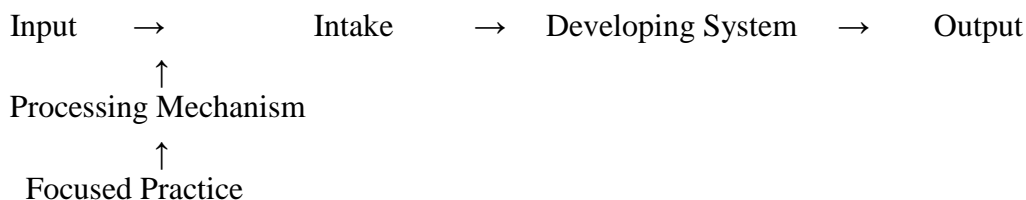
### 1.2. Processing instruction (PI)

Processing instruction (PI) has been recently used in the field of second or foreign language teaching. The initiators of this novel approach in language teaching are (VanPatten & Cadierno, 1993) and (Lee & VanPatten, 2003). For these authors, processing instruction model based on structured input activities are efficient in a setting of second or foreign language teaching since it paves the way to attending to the linguistic items exposed to learners. In other words, PI is a new teaching method that is supposed to enhance second or foreign language learners' acquisition of their target language features. PI focuses on how learners process input (the linguistic features exposed to them). In PI, learners are pushed through structured input activities to attend to meaning. Processing instruction is made of three basic components:

- Learners are given information about a linguistic structure or form.
- Learners are informed about a particular processing strategy that may negatively affect their picking up of the form or structure during comprehension.
- Learners are pushed to process the form or structure during activities with *structured input* (Lee & VanPatten, 2003, p.142).

PI teaching model is represented in the figure below as taken from Lee and VanPatten (2003, p. 133-143)

**Figure 2. Processing –oriented instruction**



Russell (2010) stresses that a key feature of processing instruction is structured input, an input that is handled in a way to increase the communicative significance of grammatical forms. The guidelines for developing structured input activities include the following:

- Present one thing at a time.
- Keep meaning in focus.
- Move from sentences to connected discourse.
- Use both oral and written input.
- Have the learners do something with the input.
- Keep the learner's processing strategies in mind Lee & VanPatten (2003).

To start with, VanPatten and Cadierno (1993) conducted an experimental research during which, they compared processing instruction (PI) and traditional instruction (TI). The former is based on explanation and practice/experience processing input data, and the latter involved explanation and output practice of a grammatical point (p. 225). The motivation of the experiment, according to the authors, is to examine the relationship between the nature of explicit instruction and its effects on second language learning. The findings are tremendous. The pretest shows no difference between the subjects before the treatment/instruction. After

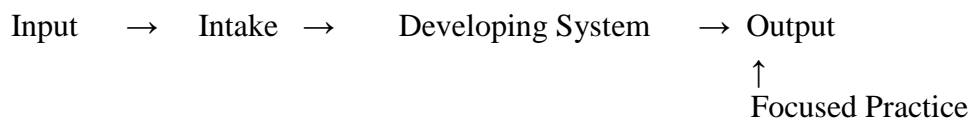
instruction, the results showed that the processing group did better than no instruction and traditional groups in terms of the interpretation test.

VanPatten and Oikkenon (1996) investigated the effect of explanation known as explicit information (EI) versus structured input (SI) in processing instruction (PI). The motivation of the research is to examine the potential effect of explicit information in studies on processing instruction, and thus, to determine whether the effectiveness of processing instruction in both interpretation and production tasks is due to explicit information or input based instruction. The study included three treatment groups, such as, the regular processing, explicit information only, and structured input only. The results of the study shows that all groups improved from pre- to posttest but with the greatest gains made by processing information group, the structured input-only, and the explanation group, respectively. Therefore, the hypothesis according to which processing instruction rather than explicit information is beneficial in language learner is proved.

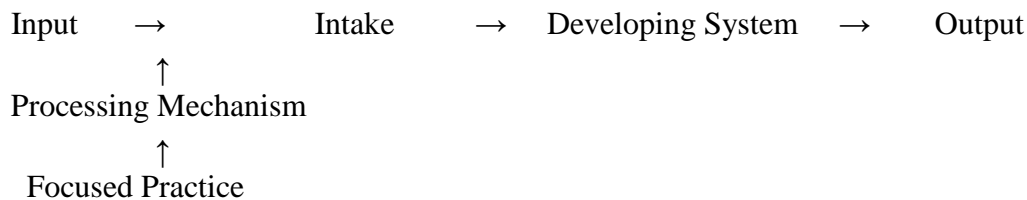
### 2- Theoretical framework

The theoretical framework of the current study consists of the analysis of the 20 articles randomly selected for further analyses. Before tackling the articles involved in this study, it is important, as stated earlier, to recall the principles of the two teaching approaches, processing instruction (PI) and traditional instruction (TI) as elaborated by Lee and VanPatten (2003, p. 133-143)

**Figure 1. Traditional -oriented teaching**



**Figure 1. Processing –oriented instruction**



The terminology used in the figures above is explained below for a better understanding.

### 1- Input

Input in general refers to any data given to a machine for processing. Yet, in second language acquisition, it means the linguistic features learners are exposed to during the learning process. In other words, input refers to data- about how the language works- available to language learners. It is the corner stone for acquisition to occur. Lee and VanPatten (2003) support that “input in language acquisition is what gets the ‘engine’ of acquisition going” since the process is similar to an “engine” that needs gas to run” (26). Therefore, without input “acquisition does not occur” (Lee and VanPatten, 2003, p.26).

### 2- Intake

An intake is generally associated with the amount of input that learners are able to successfully process and take in for granted. Coined by Corder (1967), intake is simply the linguistic items learners are able to successfully and completely assimilate into their developing systems upon exposure of input.

### 3- Developing system.

The developing system is actually where learners store the data they are completely mastered. Lee and VanPatten (2003) refers to it as the “implicit mental representation of the language” that learners are learning (132).

### 4- Output

Output is what learners are asked to produce after exposure of the teaching material and intake. Hence, output is about the production of the linguistic features acquired. For effective acquisition in second language acquisition (SLA), the input and output have to be comprehensible and meaningful.

### 5- Processing mechanism

It refers to strategies used to allow L2 learners to efficiently attend to meaning of the linguistic features exposed to them. These strategies rely on the type of practice exercises provided to learners. This is where the traditional approach and processing instruction considerably differ.

### 6- Focused practice

Unlike tradition teaching method that is based on explanation and mechanical drills, processing instruction is based on meaning based activities (known as structured input), namely referential and affective activities. The former consists of activities, such as matching, listening comprehension-time reference, which said what, and fills the blank with who performed a given activity. The latter consists of activities where learners are asked to give their point of view about something.

The 20 articles involved in the current study are summarized in the table below:

**Table 1. List of the 20 articles randomly selected**

Studies	Linguistic features tested	Experimental groups	Assessment tasks	Results
VanPatten and Cadierno (1993)	Spanish object pronoun	PI TI C	Interpretation Production	PI > TI > C PI > TI > C
Cheng (1995)	copula verbs in Spanish	PI TI C	Interpretation Production Written composition	PI > TI > C PI = TI > C PI > TI > C
VanPatten and Oikkenon (1996),	object pronoun and word order in Spanish	PI SI EI	Interpretation Production	PI = SI > EI PI > SI > EI
Buck (2000),	Spanish vs English present continuous	PI TI	Interpretation Production	PI > TI PI = TI
Allen (2000)	French causative	PI TI	Interpretation Production	PI = TI TI > PI
Farley (2001a)	Spanish subjunctive	PI (+EI) MOI (+EI)	Interpretation Production	PI > MOI PI > MOI
Farley (2001b)	Spanish subjunctive	PI (+EI) MOI (+EI)	Interpretation Production	PI = MOI PI = MOI

Studies	Linguistic features tested	Experimental groups	Assessment tasks	Results
Benati (2001)	Italian future	PI TI C	Interpretation Production 1 Production 2	PI > TI > C PI = TI > C PI = TI > C
Benati (2003)	Italian future	PI SI EI	Interpretation Production	PI = SI > EI PI = SI > EI
Farley (2003)	Spanish subjunctive	PI (+ EI) SI	Interpretation Production	PI (+EI) = SI PI (+EI) = SI
Farley (2004)	Spanish subjunctive	PI (+ EI) SI	Interpretation Production	PI (+EI) > SI PI (+EI) > SI
VanPatten and Wong (2003)	French causative	PI TI C	Interpretation Production	PI > TI > C PI = TI > C
Buck's (2006)	Spanish tense	PI TI C	Interpretation Production	PI > TI > C PI > TI > C
Fernandez (2008) Experiment I	Spanish OVS type with third person clitic object pronouns.	PI (+ EI) SI (-EI)	screening test	PI = SI
Fernandez (2008) Experiment II	third person singular present subjunctive	PI (+ EI) SI (-EI)	Screening test	PI > SI
Hashemnezhad and Zangalani (2012)	Spanish subjunctive	PI TI	Package 1 Package 2	PI > TI PI > TI
Oumelaz (2015)	English past tense	PI TI	grammatical accuracy knowledge. explicit	PI > TI PI > TI
Mountaki (2016)	Arabic subjunctive	PI TI	Interpretation production	PI > TI PI = TI
Wong and Ito (2018) Experiment 1	French causative	PI (-EI) TI (-EI)	Eye tracking	PI > TI
Wong and Ito (2018) Experiment 1	French causative	PI (+EI) TI (+EI)	Eye tracking	PI = TI

### 3- Methodology

#### 3.1. Study design

This study consists in reconsidering and reexamining the relevance of traditional instruction (TI) and processing instruction (PI) in second and foreign language teach and learning. To achieve this goal effectively, 20 articles that thoroughly addressed PI and TI have been randomly selected and summarize as represented in the table above. It is apparent from the table above that many tasks including, Production, interpretation, writing, screening, eye tracking, and grammatical accuracy have been assessed. To be much more objective vis-à-vis the different tasks, the current study narrow the focus down to 10 articles which mainly compared traditional instruction and processing instruction with regards to the production and interpretation tasks. These articles include the following as summarized in the take below:

**Table 2: Summary of the 10 articles concerned in the current study**

Study	Linguistic feature tested	Experimental groups	Assessment tasks	Results
VanPatten and Cadierno (1993)	Spanish object pronoun	PI	Interpretation	PI >TI >C
		TI	Production	PI >TI >C
		C		C
Cheng (1995)	copula verbs in Spanish	PI	Interpretation	PI >TI >C
		TI	Production	PI = TI >C
		C	Written composition	PI >TI >C
VanPatten and Oikkenon (1996),	object pronoun and word order in Spanish	PI	Interpretation	PI =SI >EI
		SI	Production	PI> SI >EI
		EI		EI
Study	Linguistic feature tested	Experimental groups	Assessment tasks	Results
Buck (2000),	Spanish vs English present continuous	PI	Interpretation	PI >TI
		TI	Production	PI =TI
Allen (2000)	French causative	PI	Interpretation	PI =TI
		TI	Production	TI >PI

Benati (2001)	Italian future	PI	Interpretation	PI > TI
		TI	Production 1	>C
		C	Production 2	PI = TI > C
Benati (2003)	Italian future	PI	Interpretation	PI = SI
		SI	Production	>EI
		EI		PI = SI > EI
VanPatten and Wong (2003)	French causative	PI	Interpretation	PI > TI > C
		TI	Production	PI = TI > C
		C		C
Buck (2006)	Spanish tense	PI	Interpretation	PI > TI > C
		TI	Production	PI > TI > C
		C		TI > C
Mountaki (2016)	Arabic subjunctive	PI	Interpretation	PI > TI
		TI	production	PI = TI

### 3.2. Procedures

As stated earlier, the current study is a comparative study which uses a qualitative collection and analysis methods. 20 articles were initially collected and then narrowed down to 10 articles to better measure the relevance of processing instruction and traditional instruction vis-à-vis the production and interpretation tasks as represented above.

### 3.3. Statistical treatment

A statistical treatment in data analysis is the statistical method applied to the data collected. There are two types of statistical treatments, including parametric and nonparametric tests. A parametric test is used to make assumptions about the parameters of the population distribution from which the sample is drawn. The current study uses parametric sampling procedures since the sample has been randomly selected. Since we have a comparative analysis of two qualitative variables, processing instruction and traditional instruction, the McNemar test is used. It is used, in statistics, to pair nominal data as it is applied to 2 x 2 contingency tables with a dichotomous trait, with a match pair of subjects, to determine whether the row and column marginal frequencies are equal (Sheskin, 2004).

### 4- Results

This study is a comparative analysis between two qualitative variables (TI and PI) for the same sample which implies that it is not a case of sample independence. Hence, the



test that is used is the McNemar's test. The null hypothesis would be that there is no difference between the teaching methods (TI, PI) and the alternative one is that one of the methods is more efficient than the other. The chi-square value is calculated as follows:

- $\chi^2 = (c-b)^2 / (c + b)$  and the results are compared result obtained with the chi-square table:
- if  $\chi^2 >$  to the critical value of the chi-square table then we reject the null hypothesis.

This study involves tables with two rows and two columns which give a degree of freedom of 1 and with a risk of 5% (0.05). The critical value of the chi-square table is 3.84.

The calculations were made for the two assessment tasks (interpretation and production).

The results of the current study are represented on the tables below:

<b>Production</b>				<b>Interpretation</b>				
	PI	TI		PI	TI		PI	TI
	1	0		1	0		1	0
	1	1		1	0		1	0
	0	1		1	0		1	0
	1	0		1	0		1	0
	1	1		1	1		1	1
	1	1		1	0		1	0
	1	0		1	0		1	0
	1	1		1	0		1	0
	1	0		1	0		1	0
	1	1		1	0		1	0
1	9	6	1	10	1			
0	1	4	0	0	9			

	PI+	PI-	Total		PI+	PI-	Total
TI+	5	1	6	TI+	1	0	1
TI-	4	0	4	TI-	9	0	9
Total	9	1	10	Total	10	0	10

Calculated value of observed proportions (production)

PI+	0,9
TI+	0,5

Chi-square 1,8

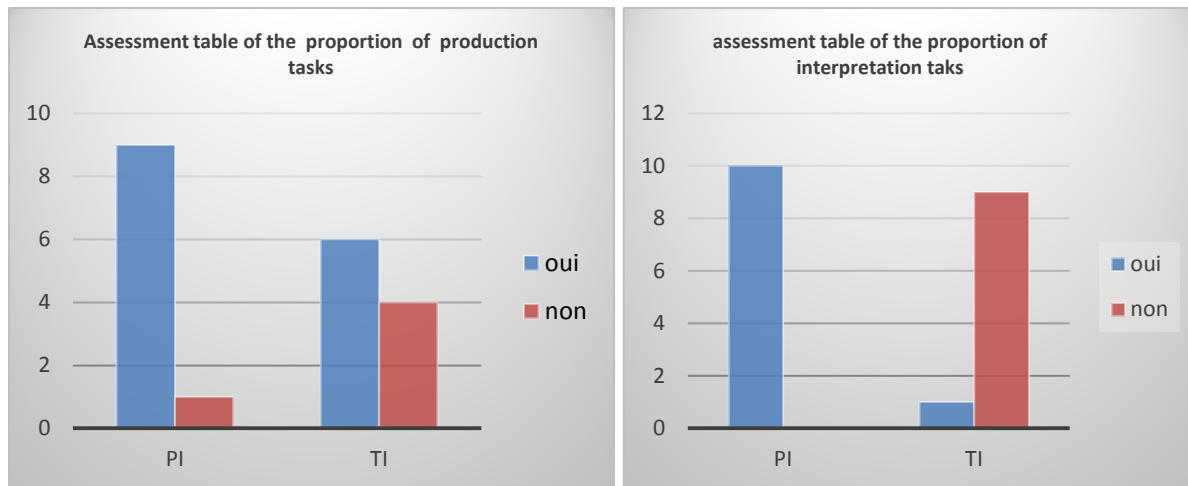
Calculated value of observed proportions (interpretation)

PI+	1,00
TI+	0,10

Chi-square 9,0000

The assessments of the production and interpretation tasks are further represented in the histograms below:

	PI	TI		PI	TI
oui	9	6	oui	10	1
non	1	4	non	0	9



With regards to the assessment of the interpretation tasks, the PI method seems to be the most efficient with a proportion of 100% against 10% for the TI method but is this difference statistically significant?

The test gives a calculated value of  $9 > 3.84$  which means that the null hypothesis according to which there is no difference between the 2 methods is rejected. This means that the difference observed between PI and TI is statistically significant and therefore, the PI method is more efficient than the TI method in second and foreign language teaching.

For the assessment of the production tasks, the PI method seems to be the most efficient with a proportion of 90% against 50% for the TI method but is this difference statistically significant?

The test gives a calculated value of  $1.8 < 3.84$  which means that the null hypothesis according to which there is no difference between the two methods cannot be rejected. The difference observed between PI and TI is not statistically significant. Thus, there is no difference between the two methods when it comes to production tasks.

## 5. Discussion

The results of the current study as elaborated above allow us to measure the efficiency and relevance of both processing instruction (PI) and traditional instruction (TI) vis-a-vis production and interpretation tasks. The results of the study have proven that PI teaching method is relevant and beneficial in both production and interpretation tasks since the PI group outperformed the TI group in both production and interpretation tests. Yet, the difference between PI and TI group is not statistically significant in production tasks. This means that TI is beneficial where production tasks are involved and therefore, should not be overlooked in second and foreign language teaching.

These results also allow the current investigation to provide answers to the research questions as follows:

### 1. Why is TI believed not to be relevant in second and foreign language learning?

TI has been proven to be irrelevant in second and foreign language teaching for many reasons. First of all, studies have demonstrated that mere explanation does not facilitate acquisition. Yet, they support that PI based on structured input activities paves the way to effective and efficient acquisition in the sense that learners are pushed via the structured input activities to derive form from meaning VanPatten and Cadierno (1993), VanPatten and Oikkenon (1996), Farley (2003), Buck (2000), and Morgan-Short (2004). For instance, VanPatten and Oikkenon (1996) investigated the effects of explicit instruction (EI) and processing instruction (PI) in SLA. The results of their study prove that the PI group

outperformed the EI group leading them to conclude that EI is not beneficial in SLA. In the same logic, the comparative approach of the two teaching methods assessed, in the current study, support the benefit of PI over TI in interpretation tasks since there was statistically a significant difference between them (as the McNemar test provided as with a calculated value of calculated value of  $9 > 3.84$ .) This analysis contributes to accepting the validity of the research hypothesis 1 according to which TI is believed to be irrelevant in second and foreign language learning.

However this research question needs to need to be handled with caution since some former studies including Fernandez (2008) and Farley (2003) show the benefit of TI in foreign language learning. More interestingly, the current study has proven that TI is not negligible in foreign language learning when production tasks are involved since the calculated value of the McNemar test which is  $1.8 < 3.84$  supports the null hypothesis according to which there is not statistically a significant difference between PI and TI. Therefore, the research hypothesis 1 is partially rejected. More investigations in related topics could help us better reorient the focus.

To answer the second research question,

2. How could PI be beneficial in second and foreign language learning?

It is obvious from former studies that PI which is based on structured input activities are efficient in inciting learners to pay attention to the input exposed to them in order to attend to them (VanPatten & Cadierno (1993), Cadierno (1995), Cheng (1995), Buck (2000), VanPatten and Wong, Benati (2001), and Lee and VanPatten, 2003). This is confirmed by the current research since the PI group surpassed the TI group in both production and interpretation even though the difference between PI and TI is not statistically significant for the production tasks. The results of the current study also further support the research hypothesis 2, which claims that PI is beneficial in second and foreign language learning.

## CONCLUSION

The comparative study of processing instruction (PI) and tradition instruction (TI) teaching model vis-à-vis the production and interpretation tasks have allowed us to better understand the relevance and benefit of each in second and foreign language learning. The findings of the current study have proven that PI is beneficial in both production and interpretation tasks. Yet, though TI is not beneficial with regards to interpretation tasks, it is relevant and beneficial when production tasks are involved. The McNemar test has shed light on the matter. For instance, the calculated value of McNemar test which is  $9 > 3.84$  shows that there is a statistically a significant difference between PI and TI for interpretations tasks, where PI groups outperformed TI groups. Yet, there is no significant difference statistically between both for production tasks since the calculated value of the McNemar test for the production tasks is  $1.8 < 3.84$ . It is apparent from this study that PI remains relevant in both production and interpretation tasks as compared to TI which is only relevant in production tasks. These findings support the research hypothesis two thoroughly. Yet, the research hypothesis 1 is partially accepted since TI is not completely unnecessary in foreign language learning. The production tasks have supported the relevance of TI in second and foreign language learning.

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