The Impact of Learning Styles on the Iranian EFL Learners' Input Processing

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Abstract

This research study explored the impact of learning styles and input modalities on the second language (L2) learners' input processing (IP). This study also sought to appraise the usefulness of Processing Instruction (PI) and its components in relation to the learners' learning styles and input modalities. To this end, 73 male and female Iranian EFL learners from Islamic Azad University, North Tehran Branch participated in the study. The participants from four intact classes were exposed to PI. The data were collected through a pre-test and two parallel posttests on the target structure, reconstructive elicited imitation tasks in both aural and written modes, and a structured interview. The data were analyzed using MANOVA. The findings revealed that the ectenic learners had a more form-based rather than a meaning-based approach towards IP. Input modality was also revealed to be an influential factor in L2 learners' IP. Furthermore, the Explicit Information (EI) turned out to be more of use to the ectenic learners while the synoptic group largely benefited from the Structured Input (SI) activities.

Keywords: Input processing, Learning styles, Processing instruction, Structured input activities

INTRODUCTION

There is a widespread consensus among the scholars of Second Language Acquisition (SLA) that no one can acquire a language without being exposed to input (e.g. Ellis, 2008; Krashen, 1982; Mitchell & Myles, 2004; VanPatten, 1990). However, a controversial issue surrounding SLA can be the question of how input is processed and incorporated into the learner's linguistic system. VanPatten (1996) states that input has a primary role in language acquisition. He considers that

because L2 learners have limited capacity processers, in order not to be overloaded by the incoming stimuli, they have to make a selection from the linguistic items they are exposed to. As VanPatten (1990) suggests, this happens because L2 learners cannot simultaneously attend both to the meaning and to the formal features of the target language, so employing some internal strategies, they filter input.

To account for the internal mechanisms used by L2 learners, VanPatten (1996) introduces IP model, which comprises a series of processing

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principles to refer to the default strategies employed by L2 learners when they process input.

The present study examined the generalizability of the claim made by the first principle of IP, that is, the Primacy of Meaning Principle, which suggests that L2 learners tend to process input for meaning before processing it for form (VanPatten, 1996). However, the researchers believe that L2 learners' approach towards IP may be determined by their natural, preferred learning style, rather than what has been suggested by the Primacy of Meaning Principle. Furthermore, if attending to meaning and form consumes a great deal of L2 learners' attentional resources- especially when input is in the aural mode (Wong, 2001)- what is yet to be discovered can be how L2 learners with different learning styles might process input when they are exposed to aural and written modes.

LITRATURE REVIEW

Some scholars in the field of Second Language Acquisition (SLA) unanimously agree upon the issue that input is necessary for normal language acquisition to take place (e.g. Gass, 2010; Krashen, 1982; VanPatten, 1990). In fact, without the linguistic data in the environment, the process of L2 development cannot proceed successfully. Wong (2005) stresses the need for input, maintaining that the linguistic data L2 learners are exposed to triggers the process of language acquisition. However, due to the limited capacity of the L2 learners' working memory, their internal mechanisms filter the incoming information; otherwise, it will be partially processed, or will not be processed at all.

Schmidt (1990, 1993) suggests that L2 acquisition takes place when learners notice the features of the target language. Noticing the linguistic items leads to restructuring of interlanguage and hence facilitates learning. However, Tomlin and Villa (1994) contend that only when the linguistic features of the input are detected, language acquisition can take place; yet the process of detection might not necessarily involve awareness. Robinson (1995) concurs with Schmidt in that noticing is vital for language acquisition and

it does involve awareness. He also draws upon the two opposite views and introduces a third model in which detection takes place prior to noticing, that is, the incoming linguistic data may be detected by the learner, but for it to become part of the learners' interlanguage system, it should be noticed.

Due to the nature of awareness and the difficulty involved in measuring it, SLA scholars cannot easily obtain empirical support for what they suggest. However, it is widely believed and experimentally supported that language acquisition entails some form of attention (Robinson, 1995; Schmidt 1993; Wong, 2001, 2005).

The IP Model

The IP model accounts for the cognitive processes, which are at work when input is processed and integrated into L2 learners' linguistic system. The model is mostly concerned with the faulty mechanisms or strategies adopted by L2 learners when they make form-meaning connections during real time comprehension. According to Wong (2005), form-meaning connection refers to the way referential meanings are linguistically encoded. In her opinion, noticing the form and comprehending the content encoded within that form should go hand in hand so that form-meaning mappings can take place. Thus, IP is not a comprehensive model accounting for all the underlying psycholinguistic processes when L2 learners are exposed to L2. In fact, its major concern is how learners derive intake from input regardless of their language or educational context.

What the Model presents is reflected in its two major principles. These principles include strategies employed by L2 learners, which preclude successful IP:

Principle 1: *Primacy of Meaning Principle*
VanPatten (1996; 2004; 2007) believes that L2 learners process meaning prior to form. This principle suggests that there is a kind of competition between meaning and form for the attentional processing resources, and generally meaning is the winner.

Principle 2: *First Noun Principle*

This principle suggests that irrespective of the order of the sentence elements in the learners' first language, they initially process the first noun they encounter in a sentence as the subject (VanPatten, 1996; 2004; 2007).

VanPatten (1996) also introduces an input-based, form-focused approach to grammar instruction, called PI, which can push L2 learners away from faulty strategies and help them to make correct form-meaning mappings. How learners react to Processing Instruction (PI) may be under the impact of various factors. One such factor might be L2 learners' learning styles.

Learning Styles

Learning style refers to the different ways individuals use in learning. The concept of learning styles has been clearly defined by a number of scholars. Oxford (2001) defines learning styles as "the general approaches– for example global or analytic, auditory or visual that students use in acquiring a new language or in learning any other subject" (p.359).They are "broad preferences for going about the business of learning" (Ehrman, 1996, p. 49).

There are various classifications for learning styles, yet as the existing models to cognitive styles were drifting towards confusion and misdiagnosis, Ehrman and Leaver (2003) proposed Ehrman and Leaver (E&L) Construct model, which employs overarching categories to organize the available classifications into a streamlined model. They used the terms *synoptic*, to refer to those learners who have a holistic approach towards learning and *ectenic learners*, to represent those who follow an extended or atomistic process. In foreign language learning, synoptic learners rely on their intuition and subconscious control while the ectenic learners are in conscious control of their learning process. Each scale comprises ten subscales which reveal various aspect of the category. Learning styles are considered to be appealing to educationalists, because they do not point to any personal talents, but rather refer to the approach learners employ

to do things, yet this approach might change if situations require it (Leaver, Ehrman & Shekhtman, 2005).

Purpose of the Study

Aspects of individual differences, such as L2 learners' working memory, age, background knowledge, gender, etc. have been recognized as influential factors affecting the way input is noticed and practiced (also See Lee & McNulty, 2013; Santamaria, 2007). Yet an area of SLA research, which to the best of the researchers' knowledge, has never been investigated is how different learning styles might affect the way L2 learners' process input. Hence, the present study was aimed at finding empirical evidence to see whether the L2 learners' learning styles might have any impact on the way they process input. It also targeted the efficacy of VanPatten's first principle of IP in its prediction whether or not individual's process input for meaning before processing it for form. The following research question/sub questions, therefore, were raised:

- Do learning styles affect EFL learners' IP? If so,
- Do synoptic EFL learners process input for meaning before they process it for form?
- Do ectenic EFL learners process input for meaning before they process it for form?

The target structure adopted for this study was past subjunctive. "Past subjunctive, used in subordinate clauses and after as if /as though, can refer to an unreal situation in the present. It expresses some degree of conjecture and appears after verbs like act, behave, talk, and look" (Frank, 1993, p.57). However, if the situation is true, a real tense is used to express present time:

He looks as if he knew the answer. (He gives the impression that he knows the answer, but he (probably) doesn't know or we don't know whether he knows the   answer or not).

He looks as if he knows the answer. (He knows the answer).

The rationale to choose past subjunctive as the

target structure lies in the processing problem that Iranian EFL learners might experience when they process input. This processing problem is reflected in VanPatten's (2004) Sentence Location principle, which suggests that learners tend to process items in sentence initial position before those in the final or medial positions. Hence, the research-ers postulated that as the participants rely on the lexical items in the input, they might have difficulty processing the past subjunctive form of the verb located in the medial position in a sentence. Besides, as Persian does not have past subjunctive to denote unreal conditions, it was expected that the participants could not benefit from any cross linguistic associations between their mother tongue and English as their target language.

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*He looks as if he **knew** the answer.* (He gives the impression that he knows the answer, but he (probably) doesn't know or we don't know whether he knows the answer or not).

*He looks as if he **knows** the answer.* (He knows the answer).

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tongue and English as their target language.

METHODS
Participants
There were 95 male and female undergraduate students, in the field of English translation at the Islamic Azad University; North Tehran Branch, participated in the study. The participants had been undertaking the unit called: Grammar Studies 1. After excluding the number of students who withdrew from participation in the study, the final number of participants decreased to 73.

Instruments
The instruments implemented in the study were as follows:

1) An E&L Construct questionnaire, consisting of 30 items, administered to mark the respondents' learning styles on a Likert scale. It organizes its opposite pairs of learning preferences on a line graded from 1 to 9 in either directions (Ehrman &Leaver 2003). The computed score may gravitate towards the two opposites or point to the middle of the line.

2) A sample of PET, administered to ensure the homogeneity of the participants. PET is an international examination developed by Cambridge English Language Assessment, which sanctions lower-intermediate mastery of the English language. It should be mentioned that the speaking section of the test was not administered.

3) A background questionnaire, administered to obtain some demographic information about the participants. The questionnaire also contained the following questions aiming at discovering whether or not the participants were exposed to the target language at the time of the treatment:

- Have you currently enrolled in an English class?
- Have you ever been to an English speaking region? If yes when---------- How long? -----
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- Do you have friends, colleagues or relatives who are native English speakers? --------If yes, how often do you speak to them? (List individuals separately)

   4) A pretest consisting of 40 sentence-level items to exclude the participants who were familiar with the target structure.

   5) Two comprehension-based parallel posttests including 10 items for both listening and reading components. The formats of the tests followed those of the SI activities they were practicing in the class.

   6) Reconstructive elicited imitation tasks in written and aural modes, each of which contained 10 sentence- level items. Using the guidelines mentioned in Erlam (2006) and Ellis (2005), elicited imitation tasks were designed to indicate whether the participants with different learning styles would mostly focus on form or meaning during IP.

   7) A structured interview to find out what the students mostly focused on when they were exposed to an English text

Instructional Materials

Based on PI guidelines (suggested in VanPatten, 2002, 2003), the instructional material containing EI about the past subjunctive and the relevant SI activities were developed. EI was aimed at expatiating the target structure orally to the participants, as well as, drawing the learners' attention to the typical processing errors they usually make when they interpret the sentences containing the key form.

SI activities aimed to help the learners discard faulty processing strategies and encourage them to adopt the optimal processing strategies. They included two types of activities: Referential and affective activities. Referential activities refer to the activities "for which there is a right or wrong answer and for which the participants have to rely on the target structure to get meaning" (VanPatten, 2002, p. 766). Referential tasks in this study consisted of listening and reading activities. For each sentence, the learners were required to respond with an answer that was either correct or incorrect. They had to display their correct processing by either choosing an option in binary questions or matching the appropriate drawings to the sentences they read or listened to. Affective activities were meaning-based activities that required the participants to process information and express their viewpoints, beliefs, etc. In short, there were no right or wrong answers for affective activities, and the teacher was unaware of the way the learners were going to respond.

Procedure

For the purpose of validating the content of the target structure test, three expert judges who had been teaching grammar for years, examined the items in terms of appropriateness of the instructions, timing, wording, etc. Their views resulted in modifying or discarding several items. To examine the item characteristics and reliability of the test, the researchers administered it to 50 undergraduate students in the field of English Language Translation at the Islamic Azad University, North Tehran Branch. The researchers then used KR-20 formula to measure the reliability, which was 0. 74.

To assess the appropriateness of the instructional material, in terms of the types and number of the SI activities, three English university instructors made valuable comments on them, which resulted in certain modifications. For the purpose of examining the feasibility of the procedure, the instructional materials were also piloted on the same 50 students who had taken the pilot test. Piloting the instructional materials resulted in modifying the number of activities and the time allocated for SI activities.

This research study employed a quasi-experimental, pretest/posttest design. The participants were not randomly assigned to groups, but rather, belonged to intact classes. As a major goal of the study was to investigate how subjects with different learning styles would process input, all the participants received PI. The participants' learning styles were the independent variable which had two levels of *ectasis* and *synopsis*. The

learners' IP, comprising two levels of focus on form or focus on meaning, was the dependent variable. The modality of the input was the moderator variable hypothesized to interact with the subjects' learning styles and their IP. The treatment and administration of the required assessment measures lasted six sessions. The following steps were taken in the main phase of the study:

The E&L Construct questionnaire was administered to the ninety-five participants to determine whether they were mostly ectenic or synoptic. To ensure that the participants fully comprehended the items of the questionnaire, the researcher was available during the session to answer any possible questions. The scoring procedure of the questionnaire was adopted from the scoring key of the E&L learning style questionnaire.

For the purpose of homogenizing the participants, a sample of PET was administered. The time allocated for the test was 90 minutes. The correct answer to each item received one point while there was no penalty for false responses. After the main administration of the test, the participants were rendered a score based on their performance, and those learners whose scores fell within the range of one standard deviation above and below the mean, were selected for the study. A background questionnaire was also administered to exclude those who might have had the chance of being exposed to the target structure elsewhere. Before the treatment, a pretest was administered to examine the participant's knowledge of the target structure. The students scoring more than the arbitrary cut-off score of 50 percent on the pretest were excluded from the study.

The first stage of the treatment (i.e., offering EI) was followed by a posttest to obtain more reliable evidence regarding how ectenic or synoptic learners would benefit from the EI to process input, and also to compare the results with those of the posttest following the SI activities in the next stage.

The elicited imitation tests were reconstructive in nature, which means they impeded the rote memorization of the items the students were required to repeat. As Erlam (2006) holds, an elicited imitation task which is reconstructive entails a primary focus on meaning rather than on form, and contains some delay between the presentation of the stimulus and the repetition of it.

To compare the impact of the modalities of the input on the participants' IP, the reconstructive elicited imitation tasks were designed in both aural and written modes. The aural test was described to the test takers as a "Belief Questionnaire", in which the participants were required to give their opinions about a range of topics. In this section, the participants were asked to listen to a statement, and express their opinions by marking "Agree", "Not agree", or "Undecided" on their test sheets, and then repeat the statement in correct English.

Their responses were audio recorded, and then analyzed by obligatory occasions for the use of the structure. When the test takers failed to do so, or reproduced the same concept, using a different structure, it was coded as avoidance. Each correct imitation of the target structure, which indicated that the participant had focused on form, was allocated a score of 1. The sentences conveying the same ideas in a grammatically correct structure were also scored 1, signifying that the participant had focused on meaning. However, when the target structure was attempted, but reproduced incorrectly, the sentence was allocated a score of 0.

For the reading component, the test included 10 thematically similar sentences. Erlam (2006) hypothesized that the grouping together of thematically similar sentences would hinder rote memorization and reduce the extent of attending to form. Hence, the sentences were presented in a written form on the computer screen. Having read the sentences, the subjects were required to write down what they had read. Each grammatically correct sentence was scored 1. The sentence conveying the same idea but in a different structure signified a focus on meaning and was also allocated a score of 1. However, ungrammatical or incomplete sentences were scored 0.

To have a representative sample amongst the 73 participants taking part in the study, 24 ectenic and 26 synoptic subjects (a total of 50 learners)

were randomly interviewed. In order to limit the participants' responses to the interviewer's question, a structured format was adopted.

The question posed to the participants in the structured interview was: "What do you mostly focus on when you read an English text or listen to it, form or meaning?" The participants had to choose between the two alternatives: *form* or *meaning*. Then their responses were audiotaped, counted and presented in percentages.

RESULTS

The following steps were taken for the data analyses of the present study:

The KR-21 Reliability Indices for the tests administered in this study are displayed in Table1. An independent t-test was run to compare the synoptic and ectenic groups' mean scores on the PET in order to determine whether the two groups enjoyed the same level of general language proficiency prior to the administration

of the treatment. The data analysis revealed that, the synoptic and ectenic groups showed almost the same mean scores on the PET.

Table 1
KR-21 Reliability Indices

	N	Mean	Variance	KR-21
PET	73	22.04	35.734	0.74
Target structure	73	22.55	34.918	0.74
PastSJL1	73	23.62	54.545	0.84
PastSJR1	73	24.52	47.420	0.82
PastSJL2	73	24.10	44.532	0.81
PastSJR2	73	26.74	47.390	0.83

As Table 2 shows, the results of the independent t-test (t (59) = .782, p > .05, r = .10 representing a weak effect size) indicated that there was not any significant difference between the two groups' mean scores on the PET, and the two groups enjoyed the same level of general language proficiency.

Table 2
Independent Samples Test, PET by Groups

	Levene's Test for Equality of Variances			*t*-test for Equality of Means					
	F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	4.685	.034	.799	71	.427	1.123	1.406	-1.68	3.927
Equal variances not assumed			.782	59.544	.437	1.123	1.436	-1.75	3.997

An independent *t*-test was also run to compare the synoptic and ectenic groups' mean scores on the pretest of the target structure in order to prove that both groups enjoyed the same level of English structure knowledge prior to the administration of the treatment. The result displayed almost the same means for the synoptic (M=21.74, SD=5.35) and ectenic (M=23.47, SD=6.44) groups on the pretest.

As the Table 3 displays, the results of the independent *t*-test (t (71) = 1.25, *p* > .05, r = .14 representing a weak effect size) indicated that there was not any significant difference between the two groups' mean scores on the pretest and the two groups were at the same level of English structure knowledge prior to the administration of the treatment.

Table 3

Independent Samples Test, Pretest of Target Structures by Groups

	Levene's Test for Equality of Variances		*t*-test for Equality of Means					95% Confidence Interval of the Difference	
	F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.841	.362	1.250	71	.215	1.727	1.381	-1.02	4.481
Equal variances not assumed			1.235	64.41	.221	1.727	1.399	-1.06	4.521

The main research question

'Do learning styles affect EFL learners' input processing?'

A multivariate ANOVA (MANOVA) was run to compare the synoptic and ectenic groups' means on the past subjunctive reading and listening 1, and the past subjunctive reading and listening 2. Before reporting the results, it should be mentioned that the assumptions of homogeneity of covariances, and homogeneity of variances – as tested through the Box and Levene's Tests - were

met. The Box's test was no significant (M = 3, *p* > .001). Also, the Levene's F-values were all non-significant indicating that the groups enjoyed homogenous variances.

As Table 4 shows, the results of multivariate tests (F (4, 68) = 11.41, *p* < .05, partial η^2 = .40, representing a large effect size) indicated that there were significant differences between the ectenic and synoptic groups' means on the reading and listening tests 1 and 2, suggesting that learning styles affect L2 learners' IP.

Table 4

Multivariate Tests; Past Subjunctive Reading and Listening 1 and 2 by Groups

	Effect	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.980	821.389	4	68	.000	.980
	Wilks' Lambda	.020	821.389	4	68	.000	.980
	Hotelling's Trace	48.317	821.389	4	68	.000	.980
	Roy's Largest Root	48.317	821.389	4	68	.000	.980
Group	Pillai's Trace	.402	11.413	4	68	.000	.402
	Wilks' Lambda	.598	11.413	4	68	.000	.402
	Hotelling's Trace	.671	11.413	4	68	.000	.402
	Roy's Largest Root	.671	11.413	4	68	.000	.402

Based on the results of the data analysis, it can be concluded that;

A: The ectenic (M = 27.41, SE = 1.11, 95 % CI [25.18, 29.63] group significantly outperformed the synoptic group (M = 20.30, SE = 1.04, 95 % CI [18.22, 22.38] on the listening test 1 (F (1, 71) = 21.62, *p* < .05, partial η^2 = .23, representing a large effect size). The figures suggest that the ectenic group had a more successful performance on the test items, which means that they managed to focus more on the form of the aural

input, in comparison with the synoptic group.

B: The ectenic group (M = 27.97, SE = 1.04, 95 % CI [25.87, 30.06] significantly outperformed the synoptic group (M = 21.51, SE = .98, 95 % CI [19.56, 23.46] on reading 1 (F (1, 71) = 20.24, *p* < .05, partial η^2 = .22, representing a large effect size).

C: The ectenic Group (M = 27.29, SE = 1.02, 95 % CI [25.24, 29.34] significantly outperformed the synoptic group (M = 21.30, SE = .96, 95 % CI [19.39, 23.22] on listening 2 (F (1, 71) =

18.08, $p < .05$, partial $\eta^2 = .20$, representing a large effect size). However, it should be mentioned that although the ectenic group outperformed the synoptic group both in listening test 1 and 2, the mean score of the synoptic group has improved from listening test 1 (M = 20.308) to listening test 2 (M= 21.308).

D: The ectenic Group (M = 28.82, SE = 1.14, 95 % CI [26.55, 31.09]) significantly outperformed the synoptic group (M = 24.92, SE = .96, 95 % CI [22.90, 27.04] on reading test 2 (F (1, 71) = 6.25, $p < .05$, partial $\eta^2 = .081$, representing a moderate to large effect size).

Upon comparing the mean scores of both groups on reading tests 1 and 2, one can infer that the ectenic group's scores have improved only moderately from reading test 1 (M=27.97) to reading test 2 (M=28.82). However, the synoptic group's scores have improved considerably

from reading test 1 (M=21.51) to reading test 2 (M= 24.92).

The first minor research question
'Do synoptic EFL learners process input for meaning before they process it for form?'
A multivariate ANOVA (MANOVA) was run to compare the synoptic group's means on listening and reading tests 1 and 2. It should also be noted that the assumption of Sphericity – homogeneity of variances for differences between any two tests – was met (Mauchly's W = .96, p > .05). As the Table 5 suggests, the results of multivariate tests (F (3, 36) = 3.71, $p < .05$, partial $\eta^2 = .23$, representing a large effect size) indicated that there were significant differences between the synoptic group's means on reading and listening tests 1and 2. Thus, the result of the data analysis revealed that synoptic learners' IP is meaning-based.

Table 5
Multivariate Tests; Past Subjunctive Tests (Synoptic Group)

	Effect	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
PastSJ	Pillai's Trace	.236	3.710	3	36	.020	.236
	Wilks' Lambda	.764	3.710	3	36	.020	.236
	Hotelling's Trace	.309	3.710	3	36	.020	.236
	Roy's Largest Root	.309	3.710	3	36	.020	.236

Table 6 displays the synoptic group's means on the reading and listening 1and 2.

Table 6
Descriptive Statistics; Past Subjunctive Tests (Synoptic Group)

PastSJ	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Listening 1	20.308	.970	18.344	22.271
Reading 1	21.513	.982	19.524	23.501
Listening 2	21.308	.955	19.374	23.241
Reading 2	24.923	.953	22.995	26.851

Since the minor research question targeted the comparison made between listening and reading 1 and listening and reading 2, a Repeated Contrast was computed. Based on the results of the data

analysis, it can be concluded that:

A: There was not any significant difference between synoptic group's means on listening 1(M = 20.30, SE = .97, 95 % CI [18.34,

22.27]) and reading 1 (M = 21.51, SE = .98, 95 % CI [19.52, 23.50]) (F (1, 38) = .95, $p > .05$, Partial η^2 = .024 representing a weak effect size).

B: The synoptic group had a significantly higher mean on reading test 2 (M = 24.92, SE = .95, 95 % CI [22.99, 26.85]) than listening 2 (M = 21.630, SE = .95, 95 % CI [19.37, 23.24]) (F (1, 38) = 7.44, $p < .05$, Partial η^2 = .16 representing a large effect size). The scores of the synoptic group have also improved from reading test 1 (M=21.513) to reading test 2(M= 24.923). However, their scores did not improve significantly from Listening test 1 (M=20.308) to listening test 2 (M= 21.308).

The second minor research question
'Do ectenic EFL learners process input for meaning before they process it for form?'

A multivariate ANOVA (MANOVA) was run to compare the ectenic group's means on the past subjunctive listening and reading 1 and 2 (Table 7).

The results of multivariate tests (F (3, 31) = .36, p > .05, partial η2 = .034, representing a weak effect size) indicated that there were not any significant differences between the ectenic group's means on the reading and listening tests 1and 2, suggesting that ectenic learners tended to process input for form rather than meaning.

Table 7
Multivariate Tests; Past Subjunctive Tests (Ectenic Group)

	Effect	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
	Pillai's Trace	.034	.365	3	31	.779	.034
PastSJ	Wilks' Lambda	.966	.365	3	31	.779	.034
	Hotelling's Trace	.035	.365	3	31	.779	.034
	Roy's Largest Root	.035	.365	3	31	.779	.034

The results of contrast tests indicated that;

A: There was not any significant difference between the ectenic group's mean on the reading 1 (M = 27.64), and listening 1 (M = 24.58 (F (1, 33) = .17, $p > .05$, Partial η^2 = .05 representing a weak effect size).

B: There was not any significant difference between the ectenic group's mean on the reading 2 (M = 28.82) and listening 2 (M = 27.29 (F (1, 33) = 1.03, $p > .05$, Partial η^2 = .03 representing a weak effect size).

Reconstructive elicited imitation tasks
The synoptic group

An analysis of chi-square was run to compare the synoptic group's use of form and meaning when processing aural and written input. According to the result, while the synoptic group made use of form 70.5 % and meaning 29.5 % of the time when processing aural tasks, they used meaning 59.4 % and form 40.6 % of the time when processing the written input. The results of chi-square (χ^2 (1) = 40.94, $p < .05$) indicated that there were significant differences between the synoptic group's use of form and meaning when processing reading and listening tasks (Table 8).

Table 8
Chi-Square Tests; Synoptic Group's Use of Forma and Meaning

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	42.136[a]	1	.000		
Continuity Correction[b]	40.943	1	.000		
Likelihood Ratio	43.005	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	42.047	1	.000		
N of Valid Cases	476				

Note.
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 97.06.
b. Computed only for a 2x2 table

The results of Cramer's V and Phi values (.29, *p* < .05, representing a large effect size) indicated that the chi-square value of 40.94 enjoyed a large effect size.

The ectenic group

An analysis of chi-square was run to compare the ectenic group's use of form and meaning when processing aural and written tasks. The ectenic group made use of form 72.2 % and meaning 27.8 % of the time when processing aural input. They also used 52.1 % meaning and 47.9 % form when processing written input. The results of chi-square displayed in Table 9, (χ^2 (1) = 51.91, *p* < .05) indicated that there were significant differences between the ectenic group's use of form and meaning when processing written and aural tasks.

Table 9
Chi-Square Tests; Ectenic Group's Use of Forma and Meaning

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	52.911[a]	1	.000		
Continuity Correction[b]	51.916	1	.000		
Likelihood Ratio	53.962	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	52.851	1	.000		
N of Valid Cases	885				
Note. a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 160.90.					
b. Computed only for a 2x2 table					

The results of Cramer's V and Phi values (.24, p < .05, representing a large effect size) indicated that the chi-square value of 51.91 enjoyed a large effect size. It was also revealed that when the learners were exposed to aural input, the ectenic group used 72.2% form processing, while the synoptic group used form processing 70.5% of the time. Moreover, the ectenic group used meaning processing 27.8% while the synoptic group used this type of processing 29.5% of the time in the aural IP.

Considering the written IP, the ectenic group used form processing 47.9% and meaning processing 52.1%, respectively, while the synoptic group used form processing 40.6% and meaning processing 59.4% of the time. The findings point to the assumption that the ectenic learners tended towards form processing more than the synoptic learners while processing these two input modalities.

Interview

To find out which aspect of input is most prominent to the L2 learners, 50 out of 73 participants were interviewed. The question asked was: "What do you mostly focus on when you read an English text or listen to it, form or meaning?" Out of the 24 ectenic learners who were interviewed, 16 responded meaning and eight responded form, and out of the 26 synoptic learners, 21 preferred meaning and only five expressed their preference for the form of the input.

DISCUSSIONS

The results of the statistics suggested that the ectenic group significantly outperformed the synoptic group on the listening test 1. This meant that the EFL learners' learning styles affected their IP. The ectenic group could process the linguistic features of the aural input more effectively than the synoptic group, who had a more holistic approach towards the input they were exposed to.

The IP of the synoptic learners seemed to be consistent with The Primacy of Meaning Principle. This might have been due to the fact that during IP, L2 learners' working memory was taxed to the point that when the input was in the aural mode, the attention was drawn to the meaning of

the input and fewer grammatical features of the language were processed (VanPatten, 1996, 2004). That is why the synoptic learners' mean score on the listening test 1 (M=20.30) was less than that of the ectenic group (M= 27.41).

As the data analysis suggested, IP did not seem to be solely meaning-based for all types of learners. The researchers believed that learning style, as an influential factor, might have affected the way the attentional resources were exhausted. The result of the present study supports Han and Peverly's (2007) finding, which indicated that IP for some L2 learners is not meaning-based, and the L2 learners' language proficiency, as a factor, could influence IP. Han and Peverly reported that learners who possessed little language proficiency would adopt a form-based approach towards IP while more proficient learners would adopt a meaning-based approach.

The study also supports Han and Liu's (2013) research. They found out that the participants, regardless of their mother tongue and modality of the input had a form-based rather than meaning-based approach towards IP. It should also be mentioned that their participants were zero beginners of Chinese, whereas in the present study the participants had some knowledge of the target language and the factor affecting their IP seemed to have been their learning styles.

It was also revealed that the ectenic group significantly outperformed the synoptic group on the reading test 1, which means that the ectenic group managed to attend to the form of the input while they were processing it for the meaning. The finding of the present study runs counter to IP principle of the Primacy of Meaning (VanPatten 1996), which suggests that due to the limited capacity of their working memory, L2 learners initially adopt a strategy directing their attention towards content words to get the main meaning of the message.

The result of the data analysis also indicated that the discrepancy found between the ectenic group's mean scores on the listening test 1 and reading test 1 was insignificant, suggesting that their performances in both modes were almost the same. This result contradicts the findings evi-denced by some empirical studies (Johnson 1992; Lund, 1991; Wong, 2001) which indicated that processing written input might be relatively less taxing for the learners' limited attentional resources because written input is neatly segmented and learners can benefit from being in greater control over the input. However, the result obtained from the data analysis of the synoptic group's reading test 1 and listening test 1 is in line with those of Johnson (1992), Lund (1991), and Wong's (2001), which suggested that modality of input is an important variable in determining how attentional resources are constrained.

In the listening test 2 the performance of the ectenic group was superior to the synoptic group, suggesting that they could attend to the grammatical elements while processing the language for the meaning. Nevertheless, it should be mentioned that the ectenic learners' performance remained the same from listening test 1 to listening test 2. The synoptic group's mean score improved moderately from listening test 1 to listening test 2. The result also indicated that the ectenic group (M=28.82) significantly outperformed the synoptic group (M=24.92) on the reading test two. While the results obtained from the ectenic group's performance suggested only a moderate improvement from reading test 1 to reading test 2, the synoptic group's results indicated a significant improvement. As the data analysis indicated, the synoptic group with a meaning-based approach towards IP could benefit from both EI and SI activities, while the ectenic group seems to have benefited more from the EI and less from the SI activities. This was largely in contrast with that of VanPatten and Oikkenon's (1996) re-search, in which they investigated the role of EI, and concluded that SI activities alone were sufficient to cause improvement on interpretation and production tasks and that EI was not necessary or even beneficial for PI. The result also runs counter to what Wong (2004) reported. She found out that SI was sufficient to cause gains in production and interpretation of the target forms and that EI played an in-

significant role. In line with others, Benati (2004) also investigated the role of EI in the interpretation and production of Italian third person future forms, yet he came up with the finding that EI might have an effect, albeit minimal.

However, the finding of the present research supports Kondo-Brown's study (2000), who concluded that EI was enough for the learners to convert input into intake and SI activities might not be required in this process. Although a number of researchers conducting studies on the benefits of EI have observed that EI does not play any significant role in the correct processing and production of a number of linguistic forms and structures (Sanz & Morgan-Short, 2004; VanPatten & Oikkenon, 1996; Wong, 2004), it may be possible, however, that the effects of EI were hidden due to certain cognitive factors involved, including learning styles.

Upon comparing the synoptic and ectenic groups' processing of the aural and written input, the researchers also found out that in the elicited imitation tasks, the ectenic group's attending to the linguistic feature of the aural input was more successful (form= 72.2%; meaning 27.8%) than that of the synoptic group (form=70.50%; meaning =29.50%). The ectenic group also outperformed the synoptic learners in attending to the formal features of the written input. This finding is in line with a number of studies (see Han & Peverly, 2007; Han & Sun, 2009; Park, 2011) which reported that certain factors, such as mother tongue and level of proficiency might cause L2 learners to have form-based IP. This study introduces learning style, as another factor, which affects how L2 learners attend to input.

The subjects' viewpoints, as reflected in the interview, indicated that out of the whole 50 participants taking part in the interview, a total of 74% expressed their preference for the meaning and only 26% of the participants stated that they would focus on the structure of the input, as well. The finding was consistent with VanPatten's (1990, 1996, 2004) the Primacy of Meaning Principle. The result was also consistent with Wong's (2001) finding. Wong's (2001) study was a replication of VanPatten's (1990) report, however, she added the modality of the input, as a variable affecting IP.

Comparing the results of the ectenic and synoptic group's responses points to the fact that although the majority of both groups maintained that they would focus on the meaning of the input, those people having a form-based approach towards IP was mostly among the ectenics rather than the synoptics.

CONCLUSION

This research study investigated the generalizability of the Primacy of Meaning Principle when learning styles and input modalities were concerned. It also sought to explore what types of learners could benefit from PI and its components. It was revealed that there is not ample evidence in the field of instructed second language acquisition to corroborate the nature of L2 learners' IP within the framework of IP theory, for the results indicated that not all L2 learners' IP is meaning-based as the Primacy of Meaning Principle suggests. The findings support several other studies in that the learners' IP was form-based rather than meaning-based.

Language teachers should be encouraged to consider the important question of which learners benefit most from PI and which learners benefit least. As it was elucidated, individual learners' learning styles can affect their use of PI components, i.e., the ectenic learners focused on the EI they received, while the synoptic learners benefited from SI activities. What can be inferred here is that becoming aware of these nuances would provide teachers with valuable insights into the L2 learners' strengths and weaknesses resulting from their learning styles and their adoption of faulty strategies when they are involved in IP.

The research also confirmed the issue that for some L2 learners processing aural input is more cumbersome than others. This was partially due to the limited capacity of their working memory, which has often been referred to as an aspect of individual difference. This would explain why listening skill is amongst the most difficult skills

to be acquired by L2 learners and in this regard, Iranian EFL learners are no exceptions. Moreover, the research also confirmed the notion that language proficiency highly correlates with successful processing of aural input. It was also revealed that although employing appropriate strategies proves to be beneficial to L2 learners, improving the ability to process aural input needs time and practice.

This study was affected by some limitations, which should be taken into consideration while appraising the results. The first limitation referred to non-random nature of subject selection. Due to the fact that university students are assigned to classes by the university registration office, the researchers could not employ a random selection of the subjects and had to suffice to intact classes. Another limitation was in relation to the possible impact of other types of individual differences, such as gender, language aptitude, motivation, etc. As the students had to take tests repeatedly during the treatment, some of them expressed boredom and annoyance when they were sometimes required to do so within one session and this might have affected the results.

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