

The Effects of Noticing on Learners' Grammar Achievements: Cognitive and Ecological Perspectives

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Abstract

Despite a great number of studies exploring Schmidt's noticing hypothesis in the cognitive perspective of language learning, the investigations focused on noticing in the ecological perspective are rather rare in number. The present study was an attempt to examine how noticing second language recast could affect the learners' achievements of grammatical structures through these two perspectives (i.e., cognitive and ecological). To do so, one hundred and twenty first-year college students at Islamic Azad University and Applied Science University in Tehran took part in this study. The students were divided into two cognitive and ecological groups and received two different treatments. During the treatment, the learners in all groups received recast and their noticing was assessed through learners' raising hands and underlining. In the end, a posttest was conducted to measure the effectiveness of the treatment. Data analysis revealed that the ecological perspective of language learning was more conducive to noticing and subsequent language learning. The study also made contributions by actualizing the ecological project-based meaningful activities, shedding light on the importance of affordance and interaction in the context of language learning.

Keywords: awareness, cognitive language learning, ecology of language learning, noticing, recasts

1. Introduction

Attention and awareness, as fundamental parts of language learning in the second language (L2) classrooms (Mackey, 2006; Schmidt, 1990, 2001), has triggered the interest of many teachers and researchers in applied linguistics and second language acquisition (SLA). Although some researchers believe that SLA occurs implicitly, Schmidt (2010) argued that, despite a great deal of exposure to language, adult L2 learners usually fail to acquire it. In fact, L2 learning needs focused attention and more explicit modes of learning to get the result. The learners, as Schmidt (1990) maintained, are required to attend to and notice input to convert it to intake. That is why Schmidt's hypothesis (1990, 2001, 2010) is fundamental to current theories of L2 learning and is widely used to explain a key step in the acquisition processes of language. He suggested that learning requires attention because attention is "the necessary and sufficient condition for long-term storage" (Schmidt, 2001, p.16).

Many studies, in favor with Schmidt's (2001) noticing hypothesis, showed a positive effect of noticing on language learning (Baleghizadeh & Derakhshesh, 2012; Izumi, 2013; Khatib & Alizadeh, 2012; Mennim, 2007; Mirzaei et al., 2012; Navidinia et al., 2019; Ögeyik, 2017). Furthermore, Bielak and Pawlak (2013) argued that some pedagogical implementations like consciousness-raising tasks, enhanced input, a variety of task types, etc. could increase the amount of noticing during the learning process. Corrective feedback (CF), among these pedagogical applications, is widely used to boost the amount of noticing in language education. CF, as some researchers (Goo & Mackey, 2013; Loewen & Sato, 2018; Long, 2015; Lyster et al., 2013 among others) argued, could provide learners with opportunities to compare their own production with the feedback and encourage them to modify their ungrammatical structures. According to Lyster and Ranta (1997), CF can be employed in forms of recast, explicit, metalinguistic, clarification requests, elicitation, and repetition.

Since the introduction of Schmidt's noticing hypothesis (1990), some studies have concentrated on verifying and validating the theory. Tomlin and Villa (1994) argued that only attention is necessary for SLA. Tomlin and Villa (1994) and some other scholars, like Curran and Klee (1993), disagreed with Schmidt's (1990) findings. Tomlin and Villa (1994) claimed that "none of the central components of attention -- alertness, orientation, or detection--requires awareness, either to operate or as the result of processing" (p. 193). Put similarly, Truscott (1998) and Cross (2002) argued for the dissociation of awareness from learning. In fact, they asserted that the concept of noticing is vague and has no empirical support. In addition, regarding the necessity of attention for learning, Gass (1997) claimed that the strength of attention may be facilitating some kinds of learning but not others.

To wrap up the objections, it can be claimed that noticing is complex progress that requires researchers to investigate the efficiency of noticing under different instructions. For example, Leow (2006) inferred that attention to the target form alone may not be adequate to promote language internalization. Therefore, the assumptions about noticing need to be studied more in different contexts. The last years have witnessed a significant amount of research on the investigation of Schmidt's noticing hypothesis in the

cognitive perspective to language learning (CPLL); yet, minimal research attention has been directed towards examining the effects of noticing on language learning in the ecological perspective to language learning (EPLL). Van Lier (2004), in support of the ecological approach, referred to Vygotsky's (1962) sociocultural theory (SCT) by emphasizing the role of interaction. SCT was one of the trends which contributed to the emergence of EPLL. SCT concerns the relationship between language acquisition and social aspects of the language. SCT offered a new approach that language acquisition needs cognition and internalization in the form of interaction with more capable peers. However, Van Lier (2004) in EPLL, put more emphasis on the environment by stating that learning is formed in terms of the relationship between learners and the environment while they are being engaged in meaningful activities. What is perceived from EPLL is that the learners, who are aware, try to interact with the environment and pick up the language information they need for their activities. To further explore the concept of this relationship, the current study, took a critical look at these two perspectives to language learning and investigated the relationship between learners' noticing and its effect on their language learning in these two different perspectives.

2. Literature Review

2.1. *Noticing from CPLL*

The term noticing has been defined by many scholars. However, Schmidt (1990, p. 139) was among the first who claimed that "noticing is the necessary and sufficient condition for converting input into the intake." He defined noticing as "conscious registration of the occurrence of some event" (p. 29) and argued that learners must pay attention to input; additionally, Schmidt (1995), asserted that noticing is "nearly isomorphic with attention" (p. 1).

As Schmidt (1990, 1995, 2001) held, noticing is a lower level of awareness, whereas understanding represents a higher level of awareness. According to Schmidt (2001), the objects of noticing are elements of the surface structure and examples of language rather than abstract rules. On the other hand, he considered understanding as a more complex stage of awareness at which learners reflect on patterns and underlying rules. He stated that although noticing is necessary and sufficient for learning, understanding, which includes metalinguistic awareness, is not required but is facilitative for L2 acquisition. Schmidt's noticing hypothesis has two versions. In its strong version, no learning occurs without awareness. To Schmidt (2001), "the concept of attention is necessary in order to understand virtually every aspect of second language acquisition" (p. 3). Schmidt (2010) later modified his hypothesis to make the weaker claim that noticing has facilitative effects on SLA.

Unlike Schmidt (1990, 1994, 1995, 2001), Tomlin and Villa (1994) believed that the concept of attention comprises at least three separate, but interrelated, components: *alertness*, *orientation*, and *detection*. Alertness, according to Tomlin and Villa, refers to "an overall, general readiness to deal with incoming stimuli or data" (p. 190). Tomlin and Villa further defined orientation as directing attentional resources "to some type or class of sensory information at the exclusion of others" (p. 191). The third and

the most crucial mechanism, according to Tomlin and Villa, is detection, which refers to “the cognitive registration of some stimuli” (p. 190). Tomlin and Villa referred to detection as “the process by which particular exemplars are registered in memory and therefore could be made accessible to whatever the key processes are for learning, such as hypothesis formation and testing” (p. 193). The authors also proposed that none of the three components of attention requires awareness. They insisted that attention can occur without awareness although awareness necessarily requires attention.

Since attentional capacity is limited, and the learner has to attend to some elements of the input, Robinson (1995) reconciled the two different positions proposed by Tomlin and Villa (1994) and Schmidt (1990, 1993) by proposing a new model of the relationship between attention and memory. According to Robinson (1995), noticing is “detection plus rehearsal in short-term memory” (p. 296). In this regard, Robinson differentiated detection from noticing. He believed that detection is a necessity for noticing. In this sense, he believed that noticing refers to what is detected and then processed with awareness. Robinson, like Schmidt (1990), argued that noticing is necessary for learning.

Over the last years, noticing hypothesis has been receiving an increasing amount of attention from researchers in the field of SLA (Thi & Nhung, 2020). Ögeyik (2017), in a relatively recent study, compared 41 published studies on the effectiveness of noticing in language learning conducted in different countries from 2008 to 2016. Having reviewed the studies, the researcher found strong evidence confirming the positive effect of noticing on learning different language skills.

Similarly, Mennim (2007) examined the long-term effects of noticing on the oral output of Japanese English language learners by giving them classroom activities that could promote their noticing and conscious attention to form. During one academic year, the students were given some tasks that helped them notice L2 forms. The results of the study revealed that noticing had positive effects on students’ language accuracy and helped them correct their errors.

In another study, Baleghizadeh and Derakhshesh (2012) examined the effect of task repetition and reactive focus-on-form on the oral output of four intermediate Iranian English as a Foreign Language (EFL) students. The authors found that task repetition had a positive effect on the accuracy of students’ oral performance. Furthermore, Jafarpour et al. (2017) study investigated the effect of oral pushed output on the learning and retention of English perfect tenses. The findings of this study supported the facilitative effects of oral pushed output on the learning and retention of English perfect tenses.

In addition, Mirzaei et al., (2012) investigated the effect of noticing on low-intermediate and upper-intermediate EFL students’ use of correct English intonation patterns. The findings emphasized the positive effect of noticing on EFL students’ intonation patterns, as well as the long-term effect of noticing on students’ performance. Furthermore, Navidinia et al. (2019) investigated the effect of noticing on EFL students’ speaking accuracy. They found that learners in the group which had been motivated to notice the input more had better speaking accuracy.

A considerable amount of research focused on factors that possibly affect learners’ noticing of L2 (Amar, 2008; Amar & Spada, 2006; Birjandi & Ahangari, 2008; Bygate, 2001; Hanaoka & Izumi, 2012;

Hawkes, 2012; Qi & Lapkin, 2001; Shabani et al., 2018). As Ellis (2008) stated, there are many factors that influence noticing, like prior knowledge, past experience, task demand, individual differences in working memory, first language, L2, and attentional processes. There are also other factors contributing to the features of the input, such as difficulty, frequency, saliency, and attentional demands of the task which are likely to affect noticing language forms (Gass, 1997).

Seong (2009) claimed that that restatement, repetition, expansion, error correction, imitation, and translating Korean utterance into English were perceived as the best strategies for getting notice regardless of English proficiency levels. Furthermore, Lai et al., (2008) found that learners noticed contingent recasts more often than they noticed noncontingent recasts. They added that working memory and prewriting could potentially mediate the contingency effect of recasts. In another study, Ratschi and Gharanli (2010) concluded that input enhancement could help learners to learn conditional sentences. Bassiri (2011), also, confirmed the positive correlation between motivation and noticing international feedback.

Resting on this issue that language learning is a complex system, it is not surprising that the role of noticing has been under investigation by cognitive scholars in SLA for many years, yet Van Lier's (1996) point of view has attracted many interests by reexamining noticing from EPLL.

2.2. Noticing from EPLL

According to EPLL, language learning is seen as a set of relations between people and the world (Van Lier, 2004). The crucial concept here is affordance, which means a relationship between a learner and the environment. Gibson (1979) claimed that affordances are neither properties of the learner nor properties of the environment, but they emerge in the interaction between the learner and the environment. Similarly, Van Lier (2004, p. 91) added that "affordance refers to what is available to the person to do something with" and emphasized that "more accurately, it is action in potential and it emerges as we interact with the physical and social world." In a similar vein, Maftoon and Shakouri (2012) mentioned that the quality and quantity of input learners are exposed to could be considered as a key factor when learning is not explicit.

As Van Lier (1996) held, language must be around in the environment, however, he stated that this input is not enough. He argued that information cannot just be transmitted to us, but we must pick it up while being engaged in meaningful activities. In this regard, according to EPLL, we must first be active, and then pick up language information that is useful for our activities. The role of noticing, basically, to Van Lier (1996) is indisputable; for a learner to learn the language, noticing is to be the first step. Accordingly, Van Lier (2004) argued that in order to understand a form, noticing is not enough; one needs to do some activities on what s/he has noticed. Van Lier, unlike Krashen (1987), referred to "language engagement" in order to show that the process of understanding and learning L2 requires one to engage in activities. In fact, Van Lier (1996) emphasized that the emergence of language competencies is dependent upon meaningful activities in the form of verbal and nonverbal interaction in which learners engage.

Accordingly, Van Lier (2000) emphasized that language learning in EPLL is emergent, not a gradual and linear process since learners are in an environment full of affordances to pick up the input they need for their activities. In this theory, affordance, perception, and action are three inter-related concepts. Learners perceive what the environment offers them, interpret what they receive, and finally act upon their interpretations. Van Lier (2004) asserted that perception and action in a semiotic context are central to learning. He added that in a context that learners are surrounded with all kinds of affordances to have action and do the task, there is no need to teach language explicitly.

Therefore, as Van Lier (2000) asserted, EPLL is a kind of activity-based approach in which activities and interaction are central to language learning. Regarding this interaction, Kramsch (2002) held that the relationship between language users and the environment is considered an influential factor affecting learning in EPLL. Wen et al. (2010) did an investigation on the students learning English in Japan. They found that the students in the ecological environment had better performance than the other students. With reference to analysis on this research, they stated that from CPLL, language learning is just memorization, repetition, and mechanical learning. In the same vein, Lightbown and Spada (2013) stated that when learners have the opportunity to engage in meaningful activities, they are forced to express their thoughts and opinions and, finally, arrive at a mutual understanding with others while working together to accomplish a task. Similarly, Fahim and Sabah's (2012) study found that role-games with affordances, which require learners to have interaction, could help the students to learn vocabulary.

Since Van Lier (1994) believed that teachers are responsible to raise learners' awareness in the classroom, he explained that teachers need to do exploratory research in their classes to choose the most appropriate affordances. In other words, elevating awareness is only possible by providing learners with a variety of affordances. In this regard, the teacher's responsibility is to provide a rich language-learning environment for SLA. Following this assumption, the environment and the interactive conversation learners have with their environment make them aware of their needs and their perceptions. In effect, in EPLL, learners acquire the relevant language based on their own needs. Henceforth, it can be concluded that the target language environment provides the context for learners to acquire L2.

2.3. Recast

Recast, as Lyster and Ranta (1997) asserted, refers to "the teacher's reformulation of all or part of a student's utterance minus the error" (p. 46). Recast, as Sheen (2004) stated, is effective since it constitutes about 60 percent of CF in the context of SLA. One reason might be due to the claims that children repeat parents' recast during their first language acquisition. Moreover, Loewen and Sato (2018) in support of some researchers (Goo & Mackey, 2013; Lightbown & Spada, 2013; Long, 2015; Lyster et al., 2013) argued that recast is an appropriate type of implicit feedback on the grounds that it does not interrupt the flow of learners' communication. The next advantage is that recast provides the correct form of the language after the learner's erroneous statement. Because of that, Goo and Mackey (2013) and Lyster and Ranta (2013)

referred to recast as input-providing feedback, indicating to learners the correct form of linguistic utterance. Long (2007) and Goo and Mackey's (2013) investigations illustrated the superiority of input-providing to other output-prompting feedbacks. Output-prompting feedback does not provide the correct form for the learner; rather, it attempts to elicit the correct form from the learner.

Although numerous studies have been reported on the effect of noticing on learners' intake within CPLL, much research is needed to determine how learners notice the input within EPLL and whether or not noticing has any effect on learners' achievement. Therefore, this paper is going to compare the impact of noticing recast on learners' grammatical achievement across the cognitive (CPG) and ecological groups (EPG). To this end, two research questions were posed: (1) Does noticing recast have any statistically significant impact on the learners' grammatical achievement in CPG? (b) Does noticing recast have any statistically significant impact on the learners' grammatical achievement in EPG?

3. Method

3.1. Participants

The participants were selected from eight intact classes, consisting of 120 freshmen from Islamic Azad University and Applied Science University in Tehran, Iran. The participants included both females and males and had a mean age of 20. The researchers randomly divided eight intact classes into four experimental groups as follows: writing cognitive perspective group (WCPG), oral cognitive perspective group (OCPG), writing ecological perspective group (WEPG), and oral ecological perspective group (OEPG). Since having equivalent groups with different conditions is a basic element of experimental research, the researchers randomly assigned experimental conditions or writing and oral modality to groups of participants.

3.2. Instruments

To accomplish the goals of the study, the researchers assessed the homogeneity of all groups by an Oxford Placement Test (OPT). The pretest (see Appendix A) administered to all participants included forty items on the target grammatical structures (i.e., fifteen items for three causative constructions, fifteen items for three types of conditional sentences, and ten items for two types of wish sentences). The three grammatical structures were selected since the participants were intermediate EFL students, and it seemed they had no familiarity with these structures. The pretest was an achievement test taken to make sure that the participants have failed to have previous knowledge of the target structures. The achievement test was piloted and its reliability was measured using KR-21 ($R=0.81$). Another instrument used in this study was an interview that the first author of the paper had with each participant after each session. During the interview, the participants watched the class video recording, and they told the researcher whether they had noticed the recast they received or not. The researcher transcribed all their replies for more investigation.

3.3. Procedure

To make sure that the knowledge of the target forms between the groups did not significantly vary across the groups prior to the treatment, a pretest was taken. The treatment started one week after the pretest, and participants in all four groups were exposed to an instructional program based on their grouping. The instructional program consisted of six forty-five-minute sessions. The participants in all groups were taught by the first author of the present article. She taught the target structures based on two different approaches to learning. In WCPG, the participants received oral instruction for each target structure. The following is an example carried out:

T: Do you fix your own car?

S: No, I don't.

T: Who does that for you?

S: The mechanic does.

Then,

T: You don't fix your own car.

T: You have the mechanic fix your car.

Next, the teacher wrote on the board:

Have Someone Do Something

I + have (had/ will have) + the mechanic + fix my car.

Then, for each structure, the participants received 20 writing tasks, and they were required to carry out the tasks individually. The teacher observed the answers and corrected them by reformulation of the participants' answers through recasts. Recast is a CF technique in which the teacher reformulates all or part of the incorrect utterance or sentence made by the students without explicitly indicating that the utterance or sentence was incorrect. Since noticing recast was to be measured in this study, the participants in WCPG were asked to underline the structure in the writing task anywhere they received oral recast by the teacher. Researchers have been measuring learners' noticing by employing some introspective techniques. In this study, in order to intensify the validity of research, the researcher used two ways to measure noticing recast. In this regard, stimulated recall was used as another approach to measure noticing. It must be mentioned that all the treatment sessions were recorded in order to check later the noticing of the participants. Therefore, immediately after each session, the teacher had an interview with each participant. They watched the class video recordings, and the learners told the researcher if they had noticed the recasts, they had received during the treatment session.

For OCPG, each target structure was first explained. Then, the participants were provided with some oral communicative tasks. For each structure, the participants were required to answer 20 questions orally. In order to measure noticing, the participants were asked to raise their hands anywhere they received oral recast by the teacher. The participants knew the concept of recast since it had been explained to them by

some examples. After each session, immediately, the teacher had an interview with each participant to collect additional, complementary data on their noticing.

In WEPG, the participants did not receive any instruction for the target structures. Like CPG, the participants in EPG received recast. However, the difference between CPG and EPG was the treatment. The participants in EPG did not receive any explanations of the target structures; rather they had to find the patterns of the target structures. In other words, they learned the target structures by engaging in some communicative task projects like the following:

You are on a very cold day in winter. You have an appointment with your friend, but she is late. She is late because she couldn't have her car started in the morning.

Find which grammatical structures are used to express the following items in English. Suggest your friend check the following items. Use have a causative verb for your suggestions.

- Radiator/ fill with antifreeze
- Brakes/ test
- Battery/ check

The participants had to do the tasks with the use of affordances available in class. At the beginning of each session, the participants in WEPG were given a writing project for each structure. They had access to computers, the internet, different kinds of dictionaries and guide books, and the teacher monitored and cooperated with them while they were doing their projects. Furthermore, while engaged in doing the projects, the participants received recast, and they were asked to underline the structures when they noticed each recast they received. At the end of each session, the participants were expected to arrive at the target structures themselves and complete the tasks. Then, they were interviewed in order to recheck their noticing.

The participants in OEPG, like WEPG, did not receive any instruction. The participants in OEPG had to carry out the projects orally in their groups. They had access to all the resources mentioned for WEPG. They received a recast to attend to the target structures whenever needed. In addition, the participants were asked to raise their hands whenever they noticed the recast. To triangulate the measurement of noticing, the researcher interviewed the participants by watching the video recording in class.

4. Results

The amount of noticing in this study was measured based on the recast the participants received. Therefore, the participants who noticed the recast were codified as high and low noticing based on their mean scores on noticing. For statistical analysis, those participants reflecting noticing more than twice were codified as 1, whereas those participants with no or one noticing were coded as 0 in CPG and EPG. Since the aim of the present study was to investigate the cause-and-effect relations of noticing recast and grammar achievement, the mean comparison was used.

Table 1*Descriptive Statistics in Oral and Writing CPG*

		N	Mean	Std. Deviation	Std. Error Mean
WCPG	Low	13	17.50	6.568	1.822
	High	5	11.00	3.742	1.673
OCPG	Low	22	17.14	5.203	1.109
	High	5	17.80	5.404	2.417

In order to answer the first hypothesis, two separate t-tests were utilized to determine whether high and low noticing recast had any statistically significant effect on the learners' grammatical achievement in CPG. Table 1, shows the mean score in the low noticing group ($M=17.50$) was higher than that ($M=11.00$) in the high noticing group in WCPG.

Table 2*T-Test for Low and High Noticing of Recast in CPG*

	Levene's Test for		t-test for Equality of Means						
	Equality of		t	df	Sig. (2-	Mean	Std. Error	95% Confidence Interval of the	
	Variances							tailed)	Difference
F	Sig.						Lower	Upper	
WCPG	3.261	.090	1.953	16	.069	6.154	3.151	-.526	12.834
OCPG	.190	.667	-.256	25	.800	-.664	2.594	-6.006	4.679

Table 2 shows the results of the t-test for WCPG, $t(16)=1.953$, $p=.069$, $\eta^2=.192$ indicated that there was not any significant difference in the grammar achievement of WCPG for the participants in the high noticing group ($M=11.00$, $SD=3.742$) and the low noticing group ($M=17.15$, $SD=6.568$). As Table 1 shows, the mean scores of both the high noticing group ($M=17.80$) and low noticing group ($M=17.14$) of OCPG were very close. The results of the t-test (Table 2), $t(25)=.256$, $p=.800$, furthermore, confirmed that the difference was not significant in the grammar achievement of the participants in both high and low noticing groups. Therefore, it was concluded that the performance of the two groups did not differ concerning the grammatical achievement in OCPG.

The second hypothesis stating that "noticing oral and writing recast does not have any statistically significant impact on the learners' grammatical achievement in EPG was investigated through t-test.

Table 3*Descriptive Statistics in Oral and Writing EPG*

		N	Mean	Std. Deviation	Std. Error Mean
WEPG	Low	18	15.11	5.950	1.402
	High	9	15.00	8.485	2.825
OEPG	Low	20	20.75	5.200	1.163
	High	7	21.14	5.305	2.005

Examining the mean column of Table (3) indicated that the mean score of the high noticing group ($M=21.14$) was higher than that of the low noticing group ($M=20.75$) in OEPG. However, the mean score in the high noticing group ($M=15.00$) was lower than that ($M=15.11$) in the low noticing group in WEPG.

Table 4*T-Test for Low and High Noticing of Recast in EPG*

	Levene's Test for Equality of Variances		t-test for Equality of Means				Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Lower			Upper	
WEPG	2.435	.131	.040	25	.002	.111	2.802	-5.660	5.882	
OEPG	.000	.993	-.171	25	.008	-.393	2.295	-5.119	4.333	

The results of the t-test analysis for WEPG in Table 4, $t(25) = .040$, $p = .002$, $\eta^2 = .006$, however, reveal that the difference in the grammatical achievement of WEPG for the participants in the high noticing group ($M = 15.00$, $SD = 8.458$) and the low noticing group ($M = 15.11$, $SD = 5.950$) was statistically significant. The eta squared value of .006 indicated a relatively small effect size.

Examining the mean column of Table 3 indicates that the mean score of the high noticing group ($M=21.14$) was higher than that of the low noticing group ($M=20.75$) in OEPG. The results of the t-test analysis (Table 4) revealed that the difference was statistically significant, $t(25) = .171$, $p = .008$, $\eta^2 = .001$. The participants of the high noticing group were significantly different from the participants of the low noticing group in terms of their grammar achievement mean scores.

5. Discussions

This paper examined two different perspectives on language teaching: cognitive and ecological. Regarding the tasks, each perspective allocates specific kinds of tasks engaging learners in different ways as mentioned in the previous sections. It should be mentioned that the study aimed at investigating the effect of noticing under these perspectives. Since in both groups the participants exhibited high noticing of recast and some low noticing of recast, direct between-group (between CPG and EPG) was not possible. Instead, the comparison was made between low and high noticing participants within each group. Therefore, the results of the study may provide indirect evidence for the role of noticing within the two approaches. The findings that showed no difference in CPG but significant difference in EPG suggest that noticing plays an important role in the CPLL while providing support for Van Lier's position.

The findings of the first hypothesis support the early result of Robinson (1995, 1996, 1997) that awareness at the level of noticing does not have any significant impact on learning. He reported that awareness only at the level of understanding has a significant impact on learning. Furthermore, Rosa and O'Neill (1999) and Rosa and Leow (2004) contended that awareness at the level of understanding has a more positive impact than awareness at the level of noticing. This finding does not seem to support Schmidt

(2001) arguing that, unlike noticing, understanding is not believed to be necessary for learning. He asserted that learners at this stage reflect on what they have noticed and attempt to analyze and discover patterns underlying the rules. In fact, although Schmidt considered L2 development as the synergy between awareness at the level of noticing and at the level of understanding, he remarked that while noticing is a necessary and sufficient precondition for learning, understanding has a facilitative role in SLA.

The essential role of noticing is a significant implication to be addressed in pedagogical contexts. However, the findings of this study confirmed that noticing and attention are important variables, but not the main predictors of language learning. As Leow (2015) stated, it is possible that one pays attention to an item in the input, without that item being noticed. Contrary to what Schmidt (1995) argued, noticing is not a guarantee of language learning. In other words, there is no guarantee that awareness at the level of noticing leads to learning. The performance of the participants in the low noticing group in this study confirmed this claim, showing higher mean scores on the grammar achievement than those in the high noticing group. It can be inferred that the success or failure of language learning is not attributed to the number of noticing; rather some other factors like learner variables, working memory capacity, cognitive processes, language proficiency, and learning history could be influential factors to trigger the learners' amount of noticing.

Many times, teachers have observed in the classroom that learners have noticed, for example, a grammatical structure, and after a short period of time when they are engaged in carrying out a task related to that structure, they were not able to perform the task well. One of the reasons might be due to the conditions under which they are working on the language which was the other implication of the present study. For example, this study showed that under cognitive conditions, noticing feedback did not facilitate learning, and learning is too dependent on practice, and it is a practice that makes perfect. In fact, to encode input to working memory, learners need to notice a rule, and, at the same time, keep it active in their working memory and, finally, transform the data to long term memory by rehearsal and practice. Henceforth, encoding, together with practice, is among the two fundamental concepts of learning. This is in line with Cowan's (2001) working memory perspective which stated working memory is a capacity limited processor. Cowan asserted that attention heightens the activation level of input in working memory, allowing input to remain there for a longer period of time through rehearsal and thus making it available for further processing and for entering long-term memory. Robinson (1995, 2003) also argued that the processing of information from working memory to long-term memory involves encoding that is dependent upon rehearsal.

Concerning the second hypothesis, the comparison was aimed at investigating whether noticing in oral and writing EPG result in more learners' grammar achievement. Comparing the posttest mean scores of the participants revealed that the participants showed significantly different grammar achievements across the three target structures. The current study is consistent with Van Lier (1996) who considered social interaction an essential part of language acquisition. Similar justifications have been provided by Kramsch (2002) concerning the role of mutual interaction between the language users and the environment

in language learning. Similarly, Tudor (2003) stated that “the ecological approach involves exploring the deep script of human interaction with the learning process, not in isolation, but within the broader context of students’ concerns, attitudes and perceptions” (p. 10). Vygotsky’s SCT (1962), also, emphasized the role of interaction in the process of language learning when he claimed that the human mind has a social origin.

The significant difference between noticing feedback and grammar achievement within EPG might be due to the fact that learners in EPG were engaged in meaningful project-based activities. As Van Lier (1996) stated, these activities do not only facilitate learning; rather they are fundamental to learning. It might, then, be appropriate to conclude that it is project-based activities and interactions that produce different results. The results of this study support the position that Ellis et al. (2019) held. They asserted that project-based tasks can provide different opportunities for interaction that, as a result, could foster the process of language development.

The use of affordance is the other implication of the present study. As the findings of the present study showed, affordance was seen to immensely affect and improve learners’ grammar achievement in EPLL. It seems that language practitioners need to have a more precise look into the instructional procedures used by EPLL theories. The effect of affordance in conjunction with other ecological tasks needs to be studied more in order to understand better the issues of language achievement. Having such knowledge may benefit language teachers in various aspects. Therefore, by providing affordance which is usually not used in their strategies, they would realize how appropriate input could naturally develop learners’ language features.

6. Conclusion

The present study investigated the impact of noticing on the immediate grammar gains of the learners. It would be more illuminating if future studies also take the long-term effects of noticing into account by the inclusion of retention in their design. In terms of retention, the findings of the study regarding noticing and understanding of linguistic features could have stronger justifications. The findings of the study may appropriately be interpreted under two perspectives of CPLL and EPLL. Addressing the relationship between noticing and learning conditions can be a promising line of research. Further research may construct new learning conditions or methods of presentation of L2 data.

In the present study, the noticing of the participants was assessed using raising hands, underlining, and stimulated recalls. Noticing during stimulated recall was defined as cases where learners indicated that they had identified a specific recast targeting an earlier non-target-like item; however, as Godfroid et al. (2010) stated, stimulated recall is an indirect indicator of noticing and tell us a little about cognitive processes ensure that. It would, therefore, be advisable for future studies to address the impact of noticing on language learning using eye-tracking as a more favourable indicator of measuring noticing. Measuring noticing CF through eye-tracking seems to be potentially valuable in helping researchers to determine which features of

the input are noticed and which are not because the researcher can precisely detect what learners view and attend to (Smith, 2010).

Considering the importance of CF in SLA, the present study employed just recast in correcting learners' erroneous statements. Future studies may focus on other types of feedback and compare the impact of different types of noticing on learners' language achievement. As no studies were found to investigate the relationship between noticing and language learning in EPLL, future studies may replicate this study to verify the positive result obtained here. Further research can be done to focus on other instructional and individual variables within EPLL, such as different task types, affordances, motivation, awareness, working memory, the knowledge of the first language, and individual differences. Furthermore, more research may focus on the relation between these factors and their effects on noticing.

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Appendix A:

In order to assess the participants' grammatical knowledge before the treatment and evaluate the effect of teaching the structures after the treatment, a test was developed by the researcher.

- 1- How often do you have your eyes (check).....?
- 2- If I (live) in Tehran, I would be working at a bank.
- 3- If I have enough apples, I (bake) an apple pie this afternoon.
- 4- I didn't know my friend was depressed. I wish she (tell) me.
- 5- The doctor made the patient (stay) in bed.
- 6- Would you mind if I (borrow) your cell-phone?
- 7- I really must get my eyes (test) I'm sure I need glasses.
- 8- If I (eat) breakfast several hours ago, I would not be hungry now.
- 9- I wish we (not have) a test today.
- 10- We didn't have a map, so we got (lose)
- 11- If the weather had been nice yesterday, we (go) to the zoo.
- 12- I wish the sun (shine) right now.
- 13- If it were not raining right now, I (go) for a walk.
- 14- I was getting sleepy, so I had my friend (drive) the car.
- 15- If I (be)..... a bird, I would not want to live my whole life in a cage.
- 16- Did you used to (get)..... good grades in high school?
- 17- I wish he (lend) me his car tomorrow.
- 18- If he were a good student, he (study) for the test yesterday.
- 19- Would you mind if I (have) your phone number?
- 20- I made my brother (carry) my suitcase.
- 21- I wish that she (tell) me the story tomorrow.
- 22- If she (lend) you her bike, where would you have cycled?
- 23- I got Rosa (lend) me some money so I could go to a movie last night.
- 24- If I (have) more time, I would do more exercises.
- 25- My friend didn't come to the meeting. I wish she (come) to the meeting.
- 26- Have you ever (throw)..... away something really important by mistake?
- 27- You (have) problems if you get late to work again.
- 28- He doesn't talk about the exam. I wish he (talk) about it tomorrow.
- 29- The teacher (angry) with you if you don't do your homework assignments.
- 30- I had problem (find) his house.
- 31- This rug (make) by my aunt.
- 32- I wish I (go) shopping yesterday.
- 33- I spilled some tomato sauce on my coat. I need to get my coat (clean)
- 34- Where would you go if you (want) to borrow a book.
- 35- My friend had her house (paint)
- 36- Peeling onions always makes me (cry)
- 37- I can't go with you today, but I wish (go)

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- 38- You (pass) the exam quite easily if you had studies more.
- 39- We're going to be late. I wish you (hurry)
- 40- The teacher had the class (write) a 200-word research paper.