

Original Paper

Noticing and Learning: Relationship Patterns

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Abstract

The goal of this study was to empirically investigate the noticeability of three corrective feedback (CF) techniques (recasts, prompts, and a mixture of the two) and to determine whether such noticing predicts second language (L2) development. Four groups of high-beginner college level francophone ESL learners (n = 99) and their teachers participated. Each teacher was assigned to a treatment condition that fit his CF style, and each provided feedback in response to errors with past tense and questions in the past. While the noticing of CF was assessed through immediate recall, learning was measured with picture description and spot-the-differences tasks. Inferential and qualitative analyses of noticing and learning revealed varied conclusions. Statistically, a minimal relationship between noticing and past tense scores was found. However, qualitatively, noticing appeared to predict gains on both targets for some learners, but did not prove to be a universal prerequisite for learning.

Keywords

noticing, L2 development, corrective feedback, recasts, prompts, English as a second language (ESL)

1. Introduction

Attention to form is thought to play an integral role in learning a second language (L2) (Long, 1996; Long & Robinson, 1998; Robinson, 1995, 2001, 2003; Schmidt, 1990, 1995, 2001). Learners who consciously notice the formal aspects of an L2 in the input gain an awareness of the target forms, which then helps them to monitor the accuracy of their output (Schmidt, 1990, 1995). Corrective feedback (CF), defined as the teacher's reactive move that signals a need for the learner to attend to the grammatical accuracy of what they have said (Sheen, 2011), is seen as one way to draw attention to form (Lightbown, 1998) since correcting learner error as it is made juxtaposes the inter-language form and the L2 norm. Positive effects of such comparison, however, are contingent on learner recognition of the corrective intent behind the CF. Although many studies have investigated the noticeability of feedback (Egi, 2007; Kim & Han, 2007; Mackey, Gass, & McDonough, 2000; Mackey, Philp, Egi, Fujii, & Tsunami, 2002; Philp, 2003; Trofimovich, Ammar, & Gatbonton, 2007; Ammar & Sato, 2010a) and its effectiveness (Ammar, 2008; Ammar & Spada, 2006; DeKeyser, 1993; Doughty & Varela, 1998; Ellis, Loewen, & Erlam, 2006; Lyster, 2004; Sheen, 2007; Mackey & Philp, 1998; McDonough, 2005, 2007), few have addressed the link between noticeability of CF and L2 development (e.g., Mackey,

2006; Ammar & Sato, 2010b; Taddarth, 2010). Instead, conclusions about one element have been drawn from the findings of the other. That is, studies on CF effectiveness, for example, were used to draw conclusions about its noticeability without empirically investigating the type and how much CF was noticed. The same is true of the noticeability research where, based on the noticing scores, conclusions about the effectiveness of CF were made without observed proof. The present study is an attempt to investigate the noticeability of three CF techniques and to determine whether such noticing predicts second language learning.

One of the first studies to address the noticing-learning relationship was Mackey (2006). High-intermediate participants ($n = 28$) enrolled in a university-level intensive ESL classes took part in a game show, during which they received feedback in the form of negotiation and recasts when errors were made on questions, plurals, and the past tense. Noticing, which was assessed by way of a questionnaire, online learning journals, and stimulated recall protocols, referred to the learners' awareness of the gap between their inter-language forms and the target norms (made salient by a recast). Learning, in turn, was measured by way of spot-the-differences and picture description tasks, administered immediately before and after the treatment. The results revealed that the learners were able to notice the CF and that there was a positive relationship between this noticing and L2 learning. Specifically, the learners' reports of noticing were mediated by error type, i.e., they reported more noticing for questions than for the other two targets, and their development on the questions target was superior (83% of those who noticed learned) compared to both the plural forms (50% of those who noticed learned) and the past tense forms (only one out of five learners who noticed learned, 20% of the total).

Similar results were found by Ammar and Sato (2010b), who investigated the relationship between the noticing of explicit and implicit recasts on errors with questions, the past tense, and the third person possessive determiners (PDs) among child francophone learners of English ($n = 53$). During the four-day treatment, participants engaged in seven activities that targeted morphosyntax. Noticing was measured by way of (1) online recall, executed during the activities, and (2) stimulated recall, done one day after the intervention. For the online recall, the researcher flashed a red-coloured card during CF episodes; each time the card was displayed, the participants had to write down what they were thinking at that specific moment. There were a total of 14 stops after feedback was provided with implicit recasts and 16 after explicit recasts. The stimulated recall involved the learners watching student-teacher interactions from Day 3 of the intervention and writing their thoughts on what was happening in the video each time the tape was stopped. There were 16 stops after the implicit recasts and 17 after the explicit recasts. Development on the past tense and PDs was assessed by way of a picture description task and a computerized oral picture description. Spot-the-differences tasks were used to measure the learning of questions. The results revealed that the explicit recasts were noticed more and led to more L2 knowledge gains than their implicit counterparts. Noticing was mediated by

the target structure in that PDs and past tense recasts were noticed more than questions recasts, which translated into positive changes for the learning of the past tense and PDs.

Finally, Taddarth (2010) studied the noticeability of CF (delivered by way of implicit and explicit recasts) and learner uptake. Two grade 6 classes ($n = 53$) participated in six oral activities designed to elicit the use of questions and PDs (three activities per target). Feedback was supplied in response to errors with the target features. Learning was measured by way of the pre-test/post-test design, where the learners participated in dyadic interactions with the researcher on three tasks, two of which targeted the development of questions (spot-the-differences task and a computerized picture description task) and one assessed the learning gains for PDs (picture description task). The results indicated that explicit recasts were more effective than implicit recasts in leading to uptake and language gains for both targets. The amount of uptake, however, appeared to depend on the target feature, such that errors with questions were repaired more than those with PDs. A positive relationship between uptake and the learning of questions was also reported, but the researcher cautioned against interpreting no uptake as evidence of not learning.

In summary, these studies suggest that when the corrective intent of recasts is accurately perceived, learner performance improves significantly (Taddarth, 2010). In terms of the relationship between noticing and learning, while there is evidence that noticing is dependent on the target feature, it is not clear what error types benefit from such noticing the most. That is, while Mackey (2006) and Taddarth (2010) found that the noticeability of feedback to questions translated into the most learning gains, Ammar and Sato (2010b) found PDs to be affected more by the CF that was noticed, followed by gains with the past tense and questions. While intriguing, drawing final conclusions from this body of research is both imprudent and difficult. This is because the research is still embryonic and, as such, warrants additional studies to capture the extent of what appears to be a complex relationship between noticing and learning. It is also difficult to draw conclusions about the link from the studies that examined noticing as a function of learner recall (Mackey, 2006; Ammar & Sato, 2010b) and/or uptake (Mackey, 2006; Taddarth, 2010) alone. Hence, what is needed is an investigation that systematically compares the noticeability of several CF types across different targets, using various tools to measure noticing. This current study aimed to compare the noticeability of three CF techniques (recasts, prompts, and a mixture of the two) and to determine whether such noticing translates into L2 learning outcomes. Specifically, this investigation addressed two research questions: (1) Does provision of CF promote noticing of L2 norms in an L2 classroom, and (2) Is there a relationship between learners' reports of noticing L2 norms and their subsequent L2 learning?

2. Method

2.1 Participants

The participants were three ESL teachers and their high-beginner college students ($n = 99$), who spoke

French as their first language. Seasoned ESL professionals, the teachers were English/French bilinguals, who, prior to the study, were observed and interviewed to identify if and how each provided CF. It was found that the three teachers addressed most of the learners' errors, but that they did so using different methods. While one teacher (Albert) responded to errors primarily with recasts, another (Brian) showed a clear preference for prompts. The third teacher (Charles), in turn, consistently alternated between recasts and prompts. The first author taught the control group because it was not possible to find another teacher from the same college who provided no feedback. The mean age of the participants was 20.75 years old. Prior to the study, the participants were exposed to ESL instruction for three years in primary school (~120 hours) and five years in high school (~670 hours). The classes met once a week for three hours, two of which were spent in the classroom and one in the language laboratory.

2.2 Linguistic Targets

Two morphosyntactic features - past tense and questions in the past - were chosen as the linguistic targets for the current study. The choice was motivated by previous research that showed that these two targets: (1) are problematic for ESL learners, regardless of L1; (2) represent different levels of complexity (DeKeyser, 1998, 2005); (3) are subject to L1 interference (Ammar, Sato, & Kartchava, 2010; Collins, 2002); (4) occur frequently in the input (Doughty & Varela, 1998), which facilitates their elicitation during communicative tasks (McDonough, 2007); and (5) have been shown to be good candidates for learner improvement when they are targeted with CF (Mackey & Philp, 1998; McDonough, 2005; McDonough & Mackey, 2006; Mackey, 2006 for questions; Doughty & Varela, 1998; Ellis et al., 2006; McDonough, 2007; Yang & Lyster, 2010 for past tense). Research has also shown that the noticing of CF leads to language development, though this largely depends on the technique employed and on the nature of the error (Mackey et al., 2000; Ammar, 2008; Ammar & Sato 2010a).

2.3 Intervention

The treatment consisted of two 120-minute sessions, during which the participants engaged in a communicative task designed to promote the use of both linguistic targets (adapted from Gatbonton, 1994). For each task, the students worked in groups to create accounts of their whereabouts (activity 1) or of an accident victim (activity 2), which were then questioned by the whole class. CF was provided during the student-fronted portions of the activities. No instruction on the two targets was given prior to the intervention. All the activities were videotaped.

2.4 Feedback Conditions

Recasts were operationalised as the teacher's reformulation of a learner's incorrect utterance. The Recast teacher was allowed to react with a full, partial, interrogative, or integrated reformulation. For example, in response to a student's utterance **He go to the movies yesterday*, any of the following approaches could be adopted:

Full reformulation: Okay. He went to the movies yesterday.

Partial reformulation: (He) Went.

Interrogative reformulation: Where did you say he went yesterday?

Integrated reformulation: He went to the movies yesterday. Did he go alone or with someone?

Prompts were defined as techniques that elicited the correct form from the learner. These included (1) repetition, where the teacher repeated the student's incorrect utterance, either as a whole with rising intonation or partly by zooming in on the error while withholding the correct form; (2) elicitation, where the teacher repeated part of the learner's utterance and paused at the error to provide a clue as to the problem, as well as to invite the student to self-repair; and (3) metalinguistic information, where the teacher provided metalinguistic clues but did not provide the correct form, thus pushing the learner to self-correct. Hence, the Prompt teacher could adopt any of the following in response to **He go to the movies yesterday*:

Full repetition: He go to the movies yesterday?

Partial repetition: Go yesterday? Go?

Elicitation: He *what* [stressed] yesterday?

Metalinguistic information: It happened yesterday. So what should we say? (How do we form the past in English?)

The Mixed group's teacher was asked to alternate between recasts and prompts as equally as possible during the activities.

2.5 Noticing Measures

Immediate recall, administered during class activities, and lesson reflection sheets, completed at the end of each session, were used to measure noticing. Following some CF instances, the first author lifted a red-coloured card, prompting each learner to write down (in English or French) their thoughts about what was happening in the class ("Each time you see the RED CARD, write what you are thinking in relation to the lesson"). Table 1 shows the breakdown of the CF immediate recall prompts across the three groups. The total number of stops and distractors was increased for the mixed group to ensure a comparable distribution of errors corrected with recasts and prompts.

Table 1. CF immediate recall instances across groups

CF type	Past tense	Questions	Distractors
Recast	13	12	3
Prompt	12	12	3
Mixed: Recast	10	8	7
Mixed: Prompt	8	7	
Total:	43	39	13

To allow learners extra opportunities to notice their teacher's cues, the red card was flashed after full corrective episodes (i.e., error treatment sequence, Lyster & Mori, 2006), where the teacher reacted to the error and then waited for the learner to respond; this practice is in line with previous research on

uptake (Lochtman, 2002; Panova & Lyster, 2002; Sheen, 2004). Table 2 provides examples of the immediate recall corrective episodes that were used.

Table 2. Immediate recall corrective episodes

CF type	Past tense	Questions
Recast	<u>'WE WENT TO THE AIRPORT'</u>	<u>'DID SHE TALK WITH YOU?'</u>
	S1: What did you do when you woke up?	T: Where did you meet Britney Spears?
	S2: Ahh, we don't do anything special.	T: Shopping?
	T: You did not do anything special?	S1: Yeah... [laughter]... at the hotel, it was one star but ...at the beach...
	S2: No.	T: Really?
	S2: And after, we go to the airport.	S1: Yeah. She was performing at the beach.
	T: You went to the airport?	S2: She talk with you?
	S2: No, we go to the airport....[looks at the teacher confused]... Yes.	S1: No.
	T: You went to the airport?	T: Did she talk with you?
	S2: Yes.	S1: No.
Prompt	<u>'WE TOOK THE AIRPLANE'</u>	<u>'WHAT DID YOU DO?'</u>
	T: In the airplane you ate McDo? [Class laughs.]	T: Questions!
	S3: We bought the food and after that we take airplane.	S1: What do you eat at McDonald's?
	T: After that we... (pauses, then gestures the need for the past tense)... "take" in the past tense	T: What (gestures the need for the past tense)...
	S3: Took.	S1: What did you eat?
	T: Good.	

Lesson reflection sheets, adapted from Mackey (2006), elicited the participants' impressions about the learning done in class and were analyzed qualitatively for additional evidence of noticing, which corroborated the noticing reported in the immediate recall.

2.6 Developmental Measures

Two tasks, each designed to elicit the use of one of the two target features, were completed by all groups before and immediately after the intervention. In the spot-the-differences task, used to elicit questions in the past tense, student pairs received separate accounts of a fictional character's written biography, which differed in ten ways. The students were instructed to ask each other a minimum of ten questions to identify the differences. The questions were noted down by both partners, and the

conversations were audio-recorded. To elicit the past tense usage, the participants were asked to write a narrative of what happened in a cartoon strip at a specified point in the past (i.e., yesterday, last week). To ensure linguistic uniformity, the learners had to incorporate the supplied context-appropriate verbs (10 per strip) in their stories at least once. Of the 20 verbs, four reoccurred across the tests (i.e., enter, tell, leave, and go), nine called for the regular past forms (i.e., enter, point, demand, park, deposit, climb, cross, walk, and stop), and seven called for the irregular forms (i.e., tell, leave, go, put, drive, meet, and come). All the verbs were telic and depicted accomplishment and achievement verb categories that call for the use of the past tense (Bardovi-Harlig, 1998; Collins, 2007). Two versions of the tasks (pre-test and post-test) were developed to counter the test-retest effect.

3. Data Analysis

The immediate protocols were first examined to identify the types of noticing the participants engaged in and were then used to calculate percentage noticing scores for each learner (i.e., total reports of noticing divided by total recall instances, multiplied by 100) to determine the differential noticing of recasts, prompts, and a mixture of the two. The first analysis yielded three types of noticing: (1) detection of CF and/or the correct form (Example 1), (2) exact repetition (Example 2), and (3) noticing of help (Example 3). Instances when the learners referred to context or did not respond to the recall prompt were categorized as 'no noticing' (Example 4).

Example 1:

Fanny has difficulty with the verb tenses.
The past of 'throw' is 'threw'.

Example 2:

Student: What you eat there?
Teacher: What did you eat?
Student recall: What did you eat?

Example 3:

The teacher helps us learn when he corrects.
It is good to correct the person when he makes an error.

Example 4:

I am thinking about sushi.
He is a liar.

The inter-rater reliability was 93% based on simple agreement; any disagreements were solved through

discussion between the two raters. This analysis was done in order to understand the types of noticing achieved in general, not to attribute more importance to one category over the other.

To measure changes in the target-like usage, percentage accuracy scores were computed for each target across test times. For the past tense, the total number of verbs accurately supplied in the obligatory contexts was divided by the maximum score of 10 and then multiplied by 100. If the same verb was used more than once, only its initial use was counted to offset overuse. For questions, to account for the different number of questions produced by each learner, the number of correctly formed questions was divided by the total number of questions supplied and then multiplied by 100.

The relationship between noticing of CF and learning of the target features was investigated quantitatively and qualitatively. The quantitative inquiry involved correlation of the experimental groups' gain scores (i.e., pre-test scores minus the post-test scores) on each of the targets with the overall and per target noticing scores. The regressions were run both together and separately for the three groups. The qualitative analysis, in turn, investigated relationship patterns between gain scores and reported noticing for individual students. This analysis was carried out with the understanding that language learning is highly individual and that learners may approach the task differently, with some needing to notice in order to progress and others learning despite no reported noticing.

4. Result

4.1 Noticing of CF

Before determining whether a relationship between the noticing and learning scores exists for this sample, it was necessary to identify if the learners noticed the feedback delivered in class and if so, in what amounts. Similarly, the learning outcomes had to be established (Note 1). In terms of noticing, the percentage noticing scores indicate that while all groups were able to notice the supplied feedback, the learners in both the Prompt ($M = 22.00$) and Mixed ($M = 29.28$) groups were able to notice the teacher's corrective intent more than those in the Recast group ($M = 6.70$). To establish whether these differences were significant, a one-way analysis of variance (ANOVA) was conducted and showed a statistically significant group difference, $F(2, 76) = 12.6, p = .01$ (Table 3). Specifically, the Recast group reported significantly less noticing overall than both the Prompt ($p = .006$) and Mixed ($p < .001$) groups, but the difference between the Prompt and Mixed groups was not statistically significant ($p = .214$).

Table 3. Descriptive statistics for reported noticing scores across three groups (maximum score: 100%)

Group	<i>n</i>	<i>M</i> (%)	<i>SD</i>
Recast	31	6.70	6.57
Prompt	25	22.00	21.77

Mixed	23	29.28	24.07
Total	79	18.11	20.47

To determine which of the grammatical features was noticed more overall, a paired-samples *t*-test was conducted on the noticing scores per target. Table 4 presents the descriptive statistics for the total noticing across the two targets. There was a statistically significant difference between the past tense noticing scores ($M = 10.11$) and the questions noticing scores ($M = 8.00$), $t(78) = 3.07$, $p = .003$, with the CF on past tense errors being noticed more than that on questions.

Table 4. Descriptive statistics for reported noticing scores across grammatical targets (maximum score: 100%)

Target	<i>M</i> (%)	<i>SD</i>
Past tense	10.11	11.02
Questions	8.00	11.38

In terms of group, separate analyses of variance for each morphosyntactic feature revealed a statistically significant difference in the noticing of the two morphosyntactic features ($F(2, 76) = 23.8$, $p = .01$ for the past errors, and $F(2, 76) = 6.08$, $p = .004$ for the errors with questions). The means and standard deviations are presented in Table 5. Post-hoc Tukey HSD comparisons revealed that the Recast group noticed significantly less CF on the past tense errors than the Prompt ($p = .039$) and Mixed ($p < .001$) groups. For questions, the Recast group reported significantly less noticing of CF than did the Mixed group ($p = .003$), but the Prompt group ($p = .090$) did not differ significantly from either the Recast or the Mixed group.

Table 5. Descriptive statistics for reported noticing across grammatical targets and groups (maximum score: 100%)

Group	<i>n</i>	Simple Past		Questions	
		<i>M</i> (%)	<i>SD</i>	<i>M</i> (%)	<i>SD</i>
Recast	31	3.47	4.37	3.22	4.65
Prompt	25	11.67	11.78	10.33	11.85
Mixed	23	17.39	11.52	11.88	14.90
Total	79	10.11	11.02	8.00	11.38

4.2 Learning

The homogeneity of the groups' for each of the targets prior to the intervention was ascertained by a mixed between/within-subjects analysis of variance (past tense: $F(3, 95) = .811$, $p = .49$; questions: F

(3, 95) = .217, $p = .88$). A paired-samples t -test was conducted on the post-test scores for each target to determine which of the grammatical features was learned the most. Table 6 presents the descriptive statistics for the accuracy scores across the two targets. There was a statistically significant difference between the post-test scores on past tense ($M = 28.70$) and those for questions ($M = 15.70$), $t(98) = 3.82$, $p = .006$ (two-tailed), with the past tense scores being higher than those for questions.

Table 6. Descriptive statistics for accuracy scores across grammatical targets (maximum score: 100%)

Target	M (%)	SD
Past tense	28.70	22.00
Questions	15.70	32.47

A mixed between-within subjects analysis of variance was conducted to explore the impact of intervention on the participants' scores on the past tense and questions tests across the two time periods. The means and standard deviations are presented in Table 7. No statistical Group x Time interaction was found for the past tense scores ($F(6, 190) = 4.342$, $p = .104$) or for the questions results ($F(6, 190) = 2.073$, $p = .058$).

Table 7. Descriptive statistics for accuracy scores across grammatical targets and groups (maximum score: 100%)

Group	n	Past tense				Questions			
		Pre-test		Post-test		Pre-test		Post-test	
		M (%)	SD	M (%)	SD	M (%)	SD	M (%)	SD
Recast	31	22.90	31.00	22.26	27.53	15.40	19.59	14.50	18.01
Prompt	25	32.80	36.12	40.40	37.58	11.96	19.18	19.77	26.33
Mixed	23	24.78	26.95	34.34	34.62	12.43	14.46	14.56	24.71
Control	20	19.00	29.72	17.50	25.52	12.19	20.03	13.78	19.26

4.3 Noticing and Learning

A standard multiple regression was used to determine whether the overall noticing scores would predict the amount of learning achieved for each of the features. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. For the past tense, the total variance explained by the model as a whole was 6.5%, R squared = .065, $F(1, 77) = 5.36$, $p < .05$, suggesting a weak positive correlation between noticing and gain scores for the past tense. Only the Recast group measures were statistically significant and explained an additional 22% of the variance in the past tense gain scores, R squared = .22, $F(1, 29) = 8.22$, $p < .05$. This

implies that the noticing of recasts in the classroom contributed 22% to the increase in gain scores for past tense. For questions, the total variance did not explain the model as a whole, suggesting no correlation between noticing and the questions gain scores. Furthermore, noticing of CF techniques did not contribute to the gains in questions.

A qualitative analysis was undertaken to determine a possible relationship between noticing and gain scores for individual learners. Based on their reported noticing scores, the experimental groups' learners ($n = 79$) were first divided into two groups: (1) noticing and (2) no noticing. Their gain scores for each of the two grammatical targets were then compared and classified across the 'increased', 'decreased', or 'no change' categories. The magnitude of the change ranged between 5% and above 50%, with groupings of 10%, 20%, 30%, 40%, and above 50%. The first grouping included cases with the minimal change in scores of 5% up to and including 10%. The scores in the second grouping ranged from 10.1% to 20%, and so on for the next groupings. The final grouping ($> 50\%$) encompassed all the cases where the change in scores was 40.1% to above 50%. These were bulked together because of the small number of representative cases ($n = 6$). In particular, in the 'noticing' group, there was one case where gain scores increased by 50% on past tense, by 70% on questions, and by 90% on past tense. There was also one instance where a score decreased by 43% on questions. In the 'no noticing' group, one learner's gain score increased by 50% but another learner's score decreased by 60% on questions. Finally, it is important to note that because the control group had no opportunity to report noticing, it was excluded from this analysis.

There was a total of 59 learners in the 'noticing' and 20 learners in 'no noticing' groups (Table 8). While all but one learner reported noticing in the Mixed condition, ($n = 22$; 99.6%), proportionally more people noticed corrections to form in the Prompt group (68%) than in the Recast group (64.52%). In the "no noticing" group, the highest number of people who did not report noticing was in the Recast group ($n = 11$), followed by the Prompt ($n = 8$) and then Mixed ($n = 1$) conditions.

Table 8. Noticing reports across the 'noticing' and 'no noticing' groups

<i>Group</i>	<i>n</i>	<i>Noticing</i>	<i>No noticing</i>
Recast	31	20	11
Prompt	25	17	8
Mixed	23	22	1
Total	79	59	20

As for the target, the gain scores on the past tense and questions measures across the 'noticing' and 'no noticing' groups, three 'change' categories and CF condition are presented in Table 9. Among the learners who reported noticing, 28 showed increased gains for the past tense and 22 for questions. In the 'no noticing' group, increases were higher for questions ($n = 10$) than for past tense ($n = 6$). Yet,

there were more ‘noticing’ learners with decreased gain scores on questions ($n = 17$) than on past tense ($n = 11$), and the number of ‘no noticing’ learners whose scores decreased was the same for each grammatical target (Past: 6; Questions: 6). The number of learners who reported noticing but showed no change in their gain scores was surprisingly the same for past tense ($n = 20$) and questions ($n = 20$) compared to the ‘no noticing’ learners whose scores did not change (Past: 8; Questions: 4).

Table 9. Gain scores totals per target across groups, categories, and CF conditions

Group	Target	n	Change	CF condition			
				Recast	Prompt	Mixed	
Noticing	Past	28	Increased	7	8	13	
		11	Decreased	5	3	3	
		20	No change	8	4	8	
	Qs	22	Increased	6	8	8	
		17	Decreased	8	2	7	
		20	No change	6	7	7	
	No noticing	Past	6	Increased	5	0	1
			6	Decreased	3	3	0
			8	No change	3	5	0
Qs		10	Increased	5	5	0	
		6	Decreased	3	2	1	
		4	No change	3	1	0	

In terms of the range of change, among the learners who reported noticing, the average increase in gain scores for both grammatical targets was 21.84% ($n = 50$), but the average decrease was 22.5% ($n = 28$). In the “no noticing” group, the average increase in gains amounted to 21.16% ($n = 16$), with the decrease averaging at 27.5% ($n = 12$) (Table 10).

Table 10. Range of change for combined gain scores totals across groups and categories

Group	n	Category	Range of change					Avg.
			10%	20%	30%	40%	>50%	
Noticing	50	Increased	17	19	5	6	3	21.84%
	28	Decreased	9	7	9	2	1	22.5%
No noticing	16	Increased	4	8	2	1	1	21.16%
	12	Decreased	4	1	2	4	1	27.5%

In summary, these data do not yield a definite conclusion about the role of noticing in the learning of

the past tense and questions in the past. Inferential statistics show that reported noticing predicts increased gains for the past tense, especially when the feedback is in the form of a recast. However, no such relationship was found for questions. The qualitative analysis, in turn, pointed to an association between noticing and learning for some learners and learning without noticing for others.

5. Discussion

The goal of this study was to determine whether corrective feedback to errors in the past tense and questions in the past was noticed by language learners in the classroom setting and, if so, whether there was a relationship between the reports of noticing and L2 development. The multiple regression results suggest a relationship between CF, noticing, and gain scores for one of the forms on which learners received feedback (past tense), but not for the other (questions). This was especially true when recasts were used to treat past tense errors. The qualitative analysis of the gains achieved by individual learners, in turn, revealed a puzzling picture. The data suggest that despite the noticing of CF bringing about increased gains, there was a decrease in the learners' scores. Furthermore, if conscious noticing is necessary for learning (Schmidt, 1990), then why did the learners who did not report noticing show increased gains? It may be that the change in gain scores does not necessarily follow noticing or may not even depend on it. Instead, this change suggests that learning without awareness ('subliminal learning', Schmidt, 1990) or learning below the threshold of awareness may be possible. Such a conclusion finds support not only in Truscott's (1998) assertion that noticing may be "helpful but not necessary" (p. 126), but echoes Schmidt's (1995) concerns about the provability of the noticing hypothesis – 'reports of learning without awareness will always flounder' (p. 28). Hence, based on these data, while there may be a relationship between noticing and gain scores, it is not a clear one, a finding reiterated by previous research (Mackey, 2006; Ammar & Sato, 2010b).

One reason for this may lie in the noticing measure utilised. While immediate recall is said to be more effective than retrospective recall in predicting L2 learning (Ammar & Sato, 2010a), it is not without limitations, particularly, implementation and the need to have the respondents trained in using it (Gass & Mackey, 2000). Because in this study such training was limited to a brief demonstration of what the learners were to do, some said that they were not sure what exactly was expected of them and/or how best to put their thoughts into words. This may have also been exacerbated by the broadness of the immediate recall prompt and the fact that very concrete examples on how to carry out the task could not be given (for fear of results contamination). Conversely, the pressure of having to complete the sheet together as a class might have encouraged a few learners to put anything on paper without necessarily giving it much thought.

The shortness of the intervention could be another reason for the obtained results. Specifically, it may be argued that four hours of communicative learning is not enough to see tangible outcomes and that learners need to be exposed to more targeted practice in order to see results (Gass, 1997). Moreover, it is possible that a delayed post-test could have yielded a more pronounced relationship between noticing

and learning (see Mackey, 1999).

Individual differences associated with learning in general and language in particular could have also precluded some learners from translating what was noticed into L2 gains. More particularly, in order to benefit from the supplied feedback, the learners needed to understand that they were being corrected as well as to identify the specific feature addressed by the feedback move. The extent to which these tasks could be performed may have relied not only on the type of feedback or the error it targeted, but also on the individual ability to benefit from the clues in the environment (e.g., gestures, context, task) as well as the ability to draw on particular cognitive strengths (e.g., analytical ability, memory span, attention capacity) and affective variables (e.g., anxiety, beliefs about language learning). The fact that this study focused on the immediacy of oral CF might have made these differences more apparent by potentially taxing the learners' short-term memory more than does feedback to writing.

Finally, a task that aims to provide and elicit the targeted features could be the reason for the observed gains. In other words, by virtue of their design, the two tasks used in this study may have made the use of the past tense and questions in the past inherent, inevitable, and thus repetitive, contributing to the gains among all the participants, regardless of whether or not they were aware of the target structures. For those who noticed feedback, the task helped to (1) focus their attention on the meaning that needed to be created and communicated to the rest of the class, (2) create awareness of the linguistic forms necessary to transfer the intended message, (3) push learners to access and utilize these forms, and (4) identify the purpose and the target of the feedback supplied. On the other hand, mere participation in this type of activity could have helped the non-noticing learners to focus their attention and possibly to detect the target forms in the input. However, these remained below the level of awareness required to verbalise their noticing. Regardless of their ability to report noticing, these learners benefited from the tasks, as evidenced by the increase in their gain scores. In light of this, Ortega's (2007) conclusion that language learning is a consequence of the interaction of multiple influences resonates loudly with the gains that occurred in this study, with or without the reported noticing. In particular, this learning may have resulted from either or both learner-internal (e.g., attention to form) or learner-external (e.g., a task that offers essential L2 input and feedback) influences that 'are activated in the course of engaging in meaning-making through language and action, and as a result of functional requirements of specific things done with language' (Ortega, 2007, p. 198).

6. Conclusion

While a direct link between noticing and learning could not be unequivocally established, this research has suggested a minimal association between noticing and gain scores for the past tense, and has pointed to a relationship between noticing and gain scores (for both targets) for some learners and gains without noticing for others. It may thus be argued that the noticing of CF may be helpful for some learners to acquire grammatical targets, though it does not appear to be universally necessary. This

interpretation, however, needs to be viewed with caution in light of both the obtained scores and the instruments used to measure noticing. Specifically, the amount of noticing reported on the immediate recall measure may have affected what was and was not noticed. The fact that the ‘red card’ was flashed after a select number of corrective episodes instead of after every episode (Lyster, 2004), might have decreased the saliency of the tool and thus may have prevented the participants from reporting more noticing. Yet, this should not have been a factor because the number of immediate recall stimuli was equally distributed between the groups. Still, it is possible that since the students were required to write down, and not to verbalize, their thoughts during the recall, they may have been unable to either express themselves in that format or to provide full descriptions of their ideas. This may have been exacerbated by the limited training in the usage of the tool as well as the manner in which the task was carried out (as a whole class versus individually). In spite of these issues, the recall allowed for maximum participation and was easily integrated within the regular lesson. Future studies of the noticing-learning relationship should consider different populations, proficiency levels, grammatical targets, measures as well as the possible effects of psycho-cognitive (e.g., aptitude) and affective (e.g., anxiety, motivation) differences in the learners’ performance. They should take into account the complexity of relating noticing and learning of form (e.g., Mackey, 2006) and establish sound practices of measuring, coding, and linking noticing to learning.

References

- Ammar, A. (2008). Prompts and recasts: Differential effects on second language morphosyntax. *Language Teaching Research, 12*, 183-210.
- Ammar, A., & Sato, M. (2010a). Corrective feedback, noticing, and individual differences: Exploration into their relationship with second language acquisition. Paper presented at the annual conference of Canadian Association of Applied Linguistics, Montreal, Quebec, Canada.
- Ammar, A., & Sato, M. (2010b). The importance of noticing in meaning-oriented second language classrooms. Paper presented at the 10th International Conference of the Association for Language Awareness, University of Kassel, Germany.
- Ammar, A., Sato, M., & Kartchava, E. (2010). How should noticing be measured? Evidence from classroom research on corrective feedback. Paper presented at the annual conference of American Association of Applied Linguistics, Atlanta, Georgia, U.S.A.
- Ammar, A., & Spada, N. (2006). One size fits all? Recasts, prompts and L2 learning. *Studies in Second Language Acquisition, 28*, 543-574.
- Bardovi-Harlig, K. (1998). Narrative structure and lexical aspect: Conspiring factors in second language acquisition of tense-aspect morphology. *Studies in Second Language Acquisition, 20*, 471-508.
- Collins, L. (2002). The roles of L1 influence and lexical aspect in the acquisition of temporal

- morphology. *Language Learning*, 52, 43-94.
- Collins, L. (2007). L1 differences and L2 similarities: Teaching verb tenses in English. *ELT Journal*, 61, 295-303.
- DeKeyser, R. (1993). The effect of error correction on L2 grammar knowledge and oral proficiency. *Modern Language Journal*, 77, 501-514.
- DeKeyser, R. (1998). Beyond focus on form: cognitive perspectives on learning and practicing second language grammar. In C. Doughty & J. Williams (Eds.), *Focus on Form in Classroom Second Language Acquisition* (pp. 42-63). New York: Cambridge University Press.
- DeKeyser, R. M. (2005). What makes learning second-language grammar difficult? A review of issues. In R. M. DeKeyser (Ed.), *Grammatical Development in Language Learning* (pp. 1-25). Malden, MA: Blackwell Publishing.
- Doughty, C., & Varela, E. (1998). Communicative focus on form. In C. Doughty, & J. Williams (Eds.), *Focus on Form in Classroom Second Language Acquisition* (pp. 114-138). New York: Cambridge University Press.
- Egi, T. (2007). Recasts, learners' interpretations, and L2 development. In A. Mackey (Ed.), *Conversational interaction in second language acquisition: A collection of empirical studies* (pp. 249-267). Oxford: Oxford University Press.
- Ellis, R., Loewen, S., & Erlam, R. (2006). Implicit and explicit corrective feedback and the acquisition of L2 grammar. *Studies in Second Language Acquisition*, 28, 339-368.
- Gass, S. M. (1997). *Input, interaction and the second language learner*. Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.
- Gass, S. M., & Mackey, A. (2000). *Stimulated Recall Methodology in Second Language Research*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Gatbonton, E. (1994). *Bridge to fluency: Speaking (Book 1)*. Scarborough, Ontario: Prentice-Hall Canada Inc.
- Kartchava, E., & Ammar, A. (in press). The noticeability and effectiveness of corrective feedback in relation to target type. *Language Teaching Research*.
- Kim, J. H., & Han, Z. (2007). Recasts in communicative EFL classes: do teacher intent and learner interpretation overlap? In A. Mackey (Ed.), *Conversational interaction in second language acquisition: A collection of empirical studies* (pp. 269-297). Oxford: Oxford University Press.
- Lightbown, P. M. (1998). The importance of timing in focus on form. In C. Doughty, & J. Williams (Eds.), *Focus on form in classroom second language acquisition* (pp. 177-196). New York: Cambridge University Press.
- Lochtman, K. (2002). Oral corrective feedback in the foreign language classroom: How it affects interaction in analytic foreign language teaching. *International Journal of Educational Research*, 37, 271-283.

- Long, M. (1996). The role of the linguistic environment in second language acquisition. In W. C. Ritchie, & T. K. Bhatia (Eds.), *Handbook of Language Acquisition: Vol. 2. Second Language Acquisition* (pp. 413-468). New York: Academic Press.
- Long, M., & Robinson, P. (1998). Focus on form: Theory, research, and practice. In C. Doughty, & J. Williams (Eds.), *Focus on Form in Classroom Second Language Acquisition* (pp. 15-41). New York: Cambridge University Press.
- Lyster, R. (2004). Differential effects of prompts and recasts on form-focused instruction. *Studies in Second Language Acquisition*, 26, 399-432.
- Lyster, R., & Mori, H. (2006). Interactional feedback and instructional counterbalance. *Studies in Second Language Acquisition*, 28, 269-300.
- Mackey, A. (1999). Input, interaction, and second language development: An empirical study of question formation in ESL. *Studies in Second Language Acquisition*, 21, 557-587.
- Mackey, A. (2006). Feedback, noticing and instructed second language learning. *Applied Linguistics*, 27, 405-430.
- Mackey, A., Gass, S. M., & McDonough, K. (2000). How do learners perceive implicit negative feedback? *Studies in Second Language Acquisition*, 22, 471-497.
- Mackey, A., & Philp, J. (1998). Conversational interaction and second language development: Recasts, responses, and red herrings? *The Modern Language Journal*, 82, 338-356.
- Mackey, A., Philp, J., Egi, T., Fujii, A., & Tasumi, T. (2002). Individual differences in working memory, noticing of interactional feedback in L2 development. In P. Robinson (Ed.), *Individual differences and instructed language learning* (pp. 181-209). Amsterdam: John Benjamins Publishing Company.
- McDonough, K. (2005). Identifying the impact of negative feedback and learners' responses on ESL development. *Studies in Second Language Acquisition*, 27, 79-103.
- McDonough, K. (2007). Interactional feedback and the emergence of simple past activity verbs in L2 English. In A. Mackey (Ed.), *Conversational interaction in second language acquisition: A series of empirical studies* (pp. 323-338). Oxford: Oxford University Press.
- McDonough, K., & Mackey, A. (2006). Responses to recasts: Repetitions, primed production and linguistic development. *Language Learning*, 56, 693-720.
- Ortega, L. (2007). Meaningful L2 practice in foreign language classrooms: A cognitive-interactionist SLA perspective. In R. DeKeyser (Ed.), *Practice in a second language: Perspectives from applied linguistics and cognitive psychology* (pp. 180-207). New York, NY: Cambridge University Press.
- Panova, I., & Lyster, R. (2002). Patterns of corrective feedback and uptake in an adult ESL classroom. *TESOL Quarterly*, 36, 573-595.
- Philp, J. (2003). Constraints on "noticing the gap": Nonnative speakers; noticing of recasts in NS-NNS interaction. *Studies in Second Language Acquisition*, 25, 99-126.
- Robinson, P. (1995). Attention, memory and the "Noticing Hypothesis". *Language Learning*, 45,

283-331.

- Robinson, P. (2001). Individual differences, cognitive abilities, aptitude complexes, and learning conditions in second language acquisition. *Second Language Research*, 17, 368–392.
- Robinson, P. (2003). Attention and memory during SLA. In C. Doughty, & M. H. Long (Eds.), *Handbook of second language acquisition* (pp. 631-678). Oxford: Blackwell.
- Schmidt, R. (1990). The role of consciousness in second language learning. *Applied Linguistics*, 11, 129-158.
- Schmidt, R. (1995). Consciousness and foreign language learning: A tutorial on the role of attention and awareness in learning. In R. Schmidt (Ed.), *Attention and awareness in foreign language learning* (pp. 1-63). Honolulu: Hawaii: University of Hawaii, Second Language Teaching and Curriculum Center.
- Schmidt, R. (2001). Attention. In P. Robinson (Ed.), *Cognition and second language instruction* (pp. 3-32). Cambridge: Cambridge University Press.
- Sheen, Y. (2004). Corrective feedback and learner uptake in communicative classrooms across instructional settings. *Language Teaching Research*, 8, 263-300.
- Sheen, Y. (2007). The effects of corrective feedback, language aptitude, and learner attitudes on the acquisition of English articles. In A. Mackey (Ed.), *Conversational interaction in second language acquisition: A collection of empirical studies* (pp. 301-322). Oxford: Oxford University Press.
- Sheen, Y. (2011). *Corrective feedback, individual differences and second language learning*. Springer London Limited.
- Taddarth, A. (2010). Recasts, uptake and learning: Effects and relationships. Unpublished Master's thesis, Université de Montréal.
- Trofimovich, P., Ammar, A., & Gatbonton, E. (2007). How effective are recasts? The role of attention, memory, and analytical ability. In A. Mackey (Ed.), *Conversational interaction in second language acquisition: A collection of empirical studies* (pp. 171-195). Oxford: Oxford University Press.
- Truscott, J. (1998). Noticing in second language acquisition: A critical review. *Second Language Research*, 14, 103-135.
- Yang, Y., & Lyster, R. (2010). Effects of form-focused practice and feedback on Chinese EFL learners' acquisition of regular and irregular past tense forms. *Studies in Second Language Acquisition*, 32, 235-263.

Note.

Note 1. Please note that a more detailed account and discussion of the noticing and learning results may be found in Kartchava and Ammar (in press).