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Direct Written Corrective Feedback with Metalinguistic Explanation: Investigating Language Analytic Ability

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ABSTRACT

In an attempt to add to the current body of research on written corrective feedback (CF), the current study reports on a nine-week intervention, which initially focused on the effect of direct written CF on learners' use of English articles in their writing and then examined the effect of adding metalinguistic explanation to this CF type; and finally, the effect of learners' Language Analytic Ability as an individual difference factor is investigated on language development through CF. To do so, this study used a pretest-treatment-posttest-delayed posttest research design and involved 57 intermediate female Iranian EFL learners aged 15-18 in three intact language classes, randomly assigned to the following groups: direct-only CF, direct CF with metalinguistic explanation, and control group. Initially, the findings demonstrated positive effects for direct written CF provided to learners' writing, though the short-term benefit was more evident and statistically significant. The results also revealed a positive gain pattern through time for learners that received metalinguistic explanation, which supports the provision of such information along with written CF in language classrooms. Finally, learners' language analytic ability was seen to be predictive of short-term and long-term learner gains when received metalinguistic explanation. The findings suggest that metalinguistic explanation provided as part of the feedback to language learners' writing is conducive to a higher level of cognitive engagement and leads to better learning outcomes.

Keywords: second/foreign language writing; corrective feedback; direct error correction; metalinguistic explanation; language analytic ability

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Introduction

The existence of errors in language learners' writing performance is not a new issue, and it has been approached in different ways throughout the history of second language acquisition (SLA). The research in the field eventually recognized the need for second language learners' grammatical competencies to be tapped, as errors were seen as an inherent part of a process leading to learning (Hendrickson, 1978). Unlike first language acquisition, interactional feedback was seen to have a facilitative effect on second language acquisition and errors were considered a sign of language learning (Corder, 1967). However, oral and written error corrections have taken different paths in that oral CF studies demonstrated more promising results, and generally showed positive effects for CF. Furthermore, the written CF research experienced some complications, as sometimes vague and inconsistent findings appeared in the literature, casting doubts on the effectiveness of such practice. Probably the common debate between Truscott (1996, 1999) and Ferris (1999, 2004) on the desirability of written CF is a legitimate proof for the existence of such an issue in the written CF literature.

More specifically, considering the rather contradictory arguments drawn from two similarly designed studies by Sheen (2007) and Jiang and Xiao (2014) concerning language learning processes triggered by direct written CF, the current study partially replicates Sheen's (2007) study in an attempt to find a resolution. Thus, for the purpose of this study, the initial assumption is that focusing on the writing process can be a pedagogical tool if effective feedbacks are provided in response to learner errors in writing. Moreover, a more in-depth understanding of language analytic ability (LAA) as an individual difference factor is also seen crucial to language development, as both learner differences and feedback types are factors that can have a potentially salient effect on second language writing development.

Corrective feedback

Learners are expected to make numerous errors, and teachers often feel responsible in one way or another for the eventual elimination of deviations from target language norms in learner productions. Despite findings on language learner errors and CFs in the last two decades, some scholars still state that there is currently *no agreement* on the desirability of CF (e.g., Ellis, 2012; Khanlarzadeh & Nemati, 2016; Lee, 2020; Truscott, 2010), observing the beliefs that focus on form instruction only influences language performance leaving underlying grammar or implicit knowledge unchanged (Truscott, 1999). The impetus for the formation of such a belief came from the observations that under time pressure or competing demands on attention, learners make the same errors, revealing the unchanged implicit knowledge they possess (Spada & Lightbown, 2008). The findings on written CF have been more controversial as they have often resulted in conflicting findings in different contexts, triggering the prominent debate between Truscott (1996, 1999) and Ferris (1999, 2004).

The uncertainty around written CF did not fade away in spite of the development of strong theoretical arguments favoring CF in language classrooms. The *skill acquisition theorists* argue that explicit grammatical knowledge could, through repetition and practice, be incorporated into learners' underlying grammar resulting in automaticity of such knowledge (Anderson, 1985; DeKeyser, 2007; Lyster & Saito, 2010; Lyster, Saito, & Sato, 2013; Mae & Lee, 2020; McLaughlin, 1987). Such arguments are also supported by *parallel-distributed processing* hypothesis and *connectionist* accounts of language learning in the field of cognitive psychology. In these models, it is assumed that like other skills, language learning is represented in learners' mind by associating neural networks activated and strengthened through form-meaning mappings, which are made conventional in the speech community. In this sense, CF can be considered as a way of refining the mappings by putting the spotlight on erroneous cognitive representations.

Similar arguments have also been made in Lyster and Mori's (2006) *counterbalance hypothesis*, where a mere focus on meaning is seen as insufficient. This cognition-based theory also contends that in teaching contexts where the primary focus is on meaning, CF assists with language acquisition by directing learners' attention to form when they commit errors, by enabling them to notice the gaps in their interlanguage through CF provision. Here, the assumption is that "attention is a principal component of language learning and the restructuring of the interlanguage systems requires a shift in attentional focus" (Pawlak, 2014, p. 9). Accordingly, the CF, provided to learners in the form of negative feedback, contributes to learners' constant restructuring of the gaps, as they resort to *controlled processing* (Bitchener & Ferris, 2012) and gradually move to automatization.

Written CF techniques

Responding to learner performance has a general goal of helping them to improve their language skills. Thus, as discussed earlier, feedback must be provided in ways that enable learners to notice, first of all, the nature of the feedback providing negative evidence and then the gap existing in their language (Karim & Nassaji, 2020; Rastgou, Storch, & Knoch, 2020). Hence, teachers need to develop responding methods, which can lead to such noticing and foster improvements by efficient feedback strategies. Accordingly, contrary to traditional comprehensive error corrections, where teachers used to correct all errors made by learners in their writing, focused error correction is now advocated by the written CF literature, in an effort to lower cognitive load and facilitate such processes as noticing that eventually enhance the effectiveness of the correction.

Another variation in error correction is whether corrections are done directly or indirectly. Hyland (2000) maintains that methods, which lead students to their own errors without providing correct forms, have a high success rate as a result of actively engaging them in correcting their own work. Yet, there are some concerns regarding noticing and understanding of corrections under such correction techniques. This is partly because further processing is required on the part of the learners in their attempt to understand their errors by dealing with error codes and finding a more target-like alternative. Hence, the sum of the advantages and disadvantages for both direct and indirect error correction makes them equally valid techniques for language teachers.

Moreover, both direct and indirect error corrections can also be accompanied by metalinguistic explanations providing learners with some forms of explicit comment about the nature of their errors (Ellis, 2009). Earlier studies focusing on metalinguistic explanations sought to find out if such an explicit grammatical comment has any positive effects on learners' language development processes. One such study was done by Bitchener, Young, and Cameron (2005), where 53 language learners were provided with either direct explicit CF coupled with 5 minutes oral conferencing involving metalinguistic information, or direct explicit CF only, or no feedback over a 12-week period. They found positive effects for direct explicit CF accompanied by oral conferencing; however, their results were not consistent across different target structures.

In a series of similar studies by Bitchener and colleagues (Bitchener, 2008; Bitchener & Knoch, 2008, 2009, 2010; Bitchener & Ferris, 2012), direct written CF with oral or written metalinguistic explanations were investigated on different participants and target structures. These studies found similar results, asserting overall gains for written CF, as all treatment groups outperformed the control group on both short-term and long-term measures; yet, two of the studies (Bitchener & Knoch, 2008; 2009) failed to find significant differences among treatment groups, demonstrating uncertainties in drawing conclusions on the effectiveness of a certain CF technique. Such findings underscore the need for further studies that also consider the role of factors leading to diverse

learning outcomes under similar circumstances. In another study examining direct written corrective feedback, Stefanou and Revesz (2015) argue that adding metalinguistic comment afforded little additional benefit and that higher grammatical sensitivity and familiarity with metalinguistic terminology were associated with higher improvements in the use of articles when learners only received direct feedback.

The role of factors contributing to individual differences in learning second language writing is a relatively under-researched area (Kormos, 2012). In an effort to investigate one important contributing aspect of learners' cognitive abilities, Sheen (2007) examined the differential effects of an individual difference factor on 91 intermediate learners exposed to either direct focused corrections or direct focused corrections accompanied by written metalinguistic explanations. Accordingly, she divided participants into two treatment groups and a control group and as a measure of their language aptitude, accounted for their LAA. The results demonstrated a significantly higher gain for direct correction group with a metalinguistic explanation, while learners with higher LAA benefited more from both types of CF. The results also exhibited higher gains for learners with high LAA present in the group receiving a metalinguistic explanation.

The mediating effect of learners' language aptitude was also revealed by a study by Jiang and Xiao (2014). Studying on 92 low-intermediate learners divided into two treatment groups and a control group, authors found contrasting results to that of Sheen (2007) in that learners demonstrating higher LAA benefited more from receiving direct only corrections. While Sheen argued that LAA predicted learners' capacity to make use of metalinguistic information, Jiang and Xiao maintained that all learners were able to make use of metalinguistic information and that LAA determined learners' capability to deal with corrections that were not followed by a metalinguistic explanation. The somewhat different arguments drawn from two studies with similar designs call for further studies investigating the influence of learners' language aptitude on the effectiveness of written corrective feedback.

Learner differences and language aptitude

Observing any language learning context shows that learners going through identical language instruction obtain diverse learning outcomes. Such variation in learning can be partly attributed to cognitive and affective factors shaping learning differences. Language aptitude is one of the more broadly considered cognitive abilities that can be expected to be important to learning under certain learning conditions or instructional exposures. Carroll (1991) conducted one of the earliest studies on learners' language aptitude and proposed a four-part model of language aptitude consisting of:

1. *Phonemic coding ability (i.e., the ability to code foreign sounds in a way that they can be remembered later),*
2. *Grammatical sensitivity (i.e., the ability to recognize the grammatical functions of words in sentences),*
3. *Inductive learning ability (i.e., the ability to identify patterns of correspondence and relationships involving form and meaning),*
4. *Rote learning ability (i.e., the ability to form and remember associations between stimuli).*

   (Ellis, 2004; p. 531)

In an attempt to reconceptualize language aptitude, Skehan (1998) argued that grammatical sensitivity and inductive language learning ability can be incorporated into a single component called LAA to form a three-part model of language aptitude. The assumption is that such language-related abilities determine learners' available cognitive resources, interlanguage

restructuring, and second language automatization, and can ultimately predict success in language learning; thus, individual LAA is of utmost importance to a consideration of CF practices, as they could arguably determine learners' ability to cope with grammar correction. Hence, such an ability is seen to be directly related to learners' individual cognitive processing capacity that is manifested in their attention, noticing, and cognitive comparison.

LAA has been increasingly receiving attention from the literature in recent years. Shintani and Ellis (2015) examined the mediating effect of LAA and identified feedback type, revision and target structure as the three determinants of the role played by LAA. They focused on both 'indefinite article' and 'past hypothetical conditional' and studied direct feedback against metalinguistic explanation with and without subsequent revisions. They found learners with stronger LAA to be at an advantage when provided any of the two feedback types, and they found this to be larger when followed by a revision of the writing. However, they identified this effect to be evident in the short term, except for when direct feedback addressed past hypothetical conditional errors.

In line with the growing concern for the role of LAA in learners' second language development, this study has followed Sheen (2007), where three groups were employed and direct written CF with and without metalinguistic explanation was used. It, however, is different from Sheen (2007) in a number of levels; the language learners participating in this study were homogenous in terms of sex and educational background, while also sharing Persian as their first language and they were learners of English as a foreign language. Furthermore, in a correction of the errors in the metalinguistic group, error codes commonly used for providing metalinguistic explanations were not used to lower learner cognitive load; instead, visual cues were used to ensure adequate metalinguistic input was provided without any confusions. In terms of the instruments utilized, minor modifications were made to prevent unwanted effects on results. For instance, the small booklets used in Sheen's study for the speeded dictation task were replaced by a sheet of paper in this study to prevent learner curiosity and confusion as a result of performing the odd task of dictating one sentence per page, which could in turn negatively affect the end results.

Hence, this study aims to respond to the following research questions:

1. Does Written Corrective Feedback on English article errors measured through immediate and delayed performance have any effect on EFL learners' language performance?
2. Does EFL learners' accuracy in using English articles vary significantly on subsequent language performance when provided with either direct-only feedback or direct feedback with metalinguistic explanation?
3. Is there any relationship between learners' LAA and the effect of either direct only feedback or direct feedback with metalinguistic explanation?

Method

Using an experimental design with a pretest-treatment-posttest-delayed posttest research structure, this study investigated the effect of direct written corrective feedback with and without metalinguistic explanation across three assessment points through looking at the mediating effects of learners' LAA. Accordingly, English article system was used as the focus of the study for the following reasons; first, as observed by Bitchener et al. (2005), articles are the second most recurrent English grammatical errors in language learners' writings. Second, the absence of any

article system in learners' first language (Persian) is thought to cause problems in their writings in English. Third, explicit English article instruction is not often provided to learners though it constitutes a major part of their errors (Sheen, 2007); this is while Suzuki, Nassaji and Sato (2019) argue that even when instructions are provided, multi-functionality of English articles make them difficult to provide clear explanation in an adequate manner. Finally, we focused learners' corrections on English article system to enable a closer comparison of studies. Thus, two major functions of the English articles, namely the referential indefinite article 'a(n)' for referring to something for the first time (first mention) and the referential definite article 'the' for referring to something already mentioned (subsequent mention) were the focus of research.

Participants

Participants taking part in this study were three intact classes (n = 25, n = 24, n = 18) of 15-18-year-old female EFL learners studying English at a private institute. The participants in all three classes shared Persian as their first language. All three groups were on the same language learning program and were taught by the same language instructor, and received similar instructional materials. Participants' English language proficiency was determined by means of a placement test prior to enrolling in the program and the institute nominated them at the intermediate level equivalent to IELTS 4.5. Moreover, their previous experience in learning English was determined by a language background questionnaire (the length of time for learning English courses, knowing other languages except for Persian and English, etc.) before beginning the treatment process, so they were all considered to be at roughly the same level of language proficiency. The three classes were randomly assigned to a control and two treatment groups. Throughout the data collection procedure, of 67 participants taking part in this study, 10 failed to be present on all data collection occasions, so their data had to be excluded from this study. The instructor participating in this study was a B.A. holder of English literature with 15 years of teaching experience that had three comparable classes at one language institute. The teacher was gradually trained and provided with instructions while also the second author randomly observed the classes to ensure no deviations from the pre-planned study schedule. The instructor reported on any problems that were encountered during the implementation of the treatment. Both the instructor and the learners were volunteers that signed the consent forms before participating in the study and pseudonyms were used in this study for data analysis.

Instruments

i) The language aptitude test (Schmitt, Dörnyei, Adolphs, & Durow, 2004) was used to measure each learner's LAA (see Appendix 1). In this test, learners were provided with a box, containing a list of words and phrases from an imaginary language and their English translations. To be able to answer the 14 questions, learners had to work out rules from the language samples provided in the box. Three tasks were used for pre-test, immediate post-test and delayed post-test.

ii) The materials for speeded dictation and error correction tasks were adapted from Sheen (2007). For the speeded dictation task, learners were required to write down 15 sentences read to them by the instructor under a time limit; this was to ensure no conscious monitoring and editing of the sentences would take place. There was a similar concern for error correction task, which involved 17 sentences with grammatical errors. To prevent learners' conscious focus on article errors, other grammatical errors such as wrong tense and aspect were also included.

iii) The visual material for the writing task (see Appendix 2) was in line with Byrne (1992) and was specifically produced as a writing prompt. This includes a sequence of four pictures, showing a camping incident and learners were asked to imagine they are one of the characters in the picture and describe the incident that took place when they were camping. The sequence of pictures ensured contexts where learners needed to use articles for first and subsequent mentions.

iv) As the treatment for this study, narrative tasks were adopted from Sheen (2007) where learners had the chance to read two short stories on separate occasions (a familiar story, and an unfamiliar story) and then had to reproduce the stories immediately after reading them without seeing the original text. The assumption was that learners make errors on redundant features of the language as they only remember the meaning-carrying words and so they had to work out the articles they were going to supply. This provided a context for the provision of CFs, according to the group learners were in.

Data collection procedure

This study was empirical in nature and made use of interventions as a means of testing the diverse effects of differing CF techniques. Table 1 shows that week 1 focused on administrating a test of learners' LAA prior to pre-test on all of the three groups in order to analyze the effect of language aptitude. An artificial language test was employed and learners were asked to answer questions requiring them to work out language rules based on available data. In the same session, learners were asked to fill in a short questionnaire on their language background to reassure the homogeneity of the groups under study. Administration of both tests took roughly 30 minutes in the first week and learners went through their regular instructions for the remaining 75 minutes of the session.

Pre-test

Week 2 centered on the administration of pre-test and took around 40 minutes of class time and learners wrote a composition on a picture prompt followed by speeded dictation and error correction tests. Learners were instructed through each of the writing tasks, speeded dictation and error correction tasks for no more than 15, 10, and 15 minutes, respectively. For the writing task, learners were provided with a picture prompt consisting of a picture sequence representing a storyline, accompanied by instructions and a few words they needed for writing the composition. As the purpose of this task was not to test learners' knowledge of names, they were provided with needed nouns to help them consider themselves as one of the characters in pictures and they wrote the story represented by pictures in less than 15 minutes. The sequence of pictures was thought to ensure learners' use of the articles 'a(n)' as the first mention, and anaphoric reference 'the' as the second mention. The speeded dictation test took less than 10 minutes, and learners were instructed on the procedure, where they were needed to just write one sentence on each page of the small booklets provided to them. This was to prevent learners' conscious monitoring of the errors while dictating the 15 sentences. Another measure taken was to allow a limited amount of time for each sentence to be written. Error correction task was also a part of the pre-test, and learners were provided with 17 sentences that contained grammatical errors. To prevent learners' conscious monitoring of article errors, grammatical errors like wrong use of tense and aspects were also included; however, they were not accounted for during the data analysis. In this task, learners were given 15 minutes to read the sentences and correct the errors.

Thus, Table 1 shows that the treatment and data collection took 9 weeks. This table has three columns and seven rows. The first column shows the relevant number of weeks followed by two other columns showing the activities conducted for two treatment groups and a control group. It also consists of nine weeks in the data collection schedule and the tasks conducted in each week.

Table 1
Data Collection Schedule

	Treatment Groups	Control Group
Week 1	Language analytic ability test	Language analytic ability test
Week 2	Pretest: Picture-cued writing + Speeded dictation + error correction test (40 minutes*)	Pretest: Picture-cued writing + Speeded dictation + error correction test (40 minutes*)
Week 3	Treatment 1: Narrative task + feedback	No treatment: Narrative task + no CF
Week 4	Treatment 2: Narrative task + feedback	No treatment: Narrative task + no CF
Week 5	Immediate Posttest: Picture-cued writing + Speeded dictation + error correction test (40 minutes*)	Immediate Posttest: Picture-cued writing + Speeded dictation + error correction test (40 minutes*)
Week 6	Regular instruction	Regular instruction
Week 7	Regular instruction	Regular instruction
Week 8	Regular instruction	Regular instruction
Week 9	Delayed Posttest: Picture-cued writing + Speeded dictation + error correction test (40 minutes*)	Delayed Posttest: Picture-cued writing + Speeded dictation + error correction test (40 minutes*)

*Approximate time was taken for conducting the tasks

Treatment

Week 3 provided all students with instruction through a narrative task (Sheen, 2007), and they received handouts containing a famous short story named *The Fox and The Crow* and were asked to read it a few times. Once the teacher ensured that they have understood every word and sentence, the handouts were collected, the story was read out loud by the teacher once again and learners were asked to reproduce the story as closely to the original story. On the following session within the same week, feedback on the first narrative task was provided to learners in both treatment groups and they were asked to go through their errors for a few minutes.

Week 4 provided all students with the second narrative task, involving an unfamiliar short story called *The Pet Snake*, conducted in a procedure identical to the first one. Throughout both treatment procedures, the learner performances were all collected and handed to the researcher after the first session each week for correction purposes and were handed back to the teacher for the following session. To pursue the purposes of the study, the direct correction group received feedback by having the erroneous part of their writing underlined and then the more target-like alternative was provided next to their errors. The direct metalinguistic correction treatment group, however, had all their errors underlined, correct alternative provided and metalinguistic explanations were supplied only for their article errors at the bottom of their writing papers.

The meta-linguistic explanation provided in this study was not by coding or numbering the errors and then giving explanations (Shintani & Ellis, 2013). This is because the corrections made in this study focused on English articles only, and the rules governing English article system concerning this study were limited; a couple of prepared sentences were written at the bottom of learners' writing sheets containing relevant article errors. With the direct corrections made on their writing, they had no difficulty associating the correction with the metalinguistic explanation. However, Shintani and Ellis provided a metalinguistic explanation before corrections to raise learner consciousness; however, consciousness raising was not an issue in this study.

Control Group

To ensure comparability of instructions and validity of the findings in weeks 3 and 4, both narrative tasks were also administered to the control group; the difference with the treatment groups was that they did not receive any error corrections on their writing performances on the narrative tasks they had gone through.

Post-test

On week 5, the immediate posttest was administered in the first session of the week immediately following the treatment. However, this had to be postponed to the second session within the pre-planned week in order to prevent any harm to program syllabi and was conducted on the second session of week 5, which was a week after learners in treatment groups received their narrative writings back with relevant feedback. With a procedure similar to the pretest, only the order of sentences involved in both error correction and speeded dictation tasks was altered. Moreover, for the speeded dictation task, the small notebooks used on pretest were seen to cause learner frustration and curiosity which might have negatively affected the results. Therefore, to ensure no negative effects on the results, learners were provided with a blank piece of paper with numbered lines for the post-test and they were asked to write the dictated sentences only with inerasable pens so that the modification of sentences after initial writing could be later identified and accounted for in their scores. Nevertheless, the dictation in the pretest was carefully timed to leave no extra time for learner modifications of the sentences.

Weeks 6 and 7 provided all three groups with regular language instructions according to their program syllabus; however, the schedule for Week 8 had to be postponed for a week due to the instructor's request, and the three tasks for delayed posttest were administered on Week 9. The delayed post-test was conducted to enable the investigation of delayed effects of direct correction and metalinguistic explanation and their relationship with learners' LAA. The reason for conducting the same tasks in all three testing occasions was to elicit samples of learners' performance as closely as possible to each other and to enable the comparison of their performance across three assessment points. The three-week interval between the three testing occasions was thought to eliminate any practice effects, especially since learners were not notified about the repetition of the same tasks in advance (Sheen, 2007). However, for the third assessment occasion, learners in our research were observed to be expecting the repetition of the same tasks as they were already repeated once, so this might have affected their performance in some way.

Data Analysis

The differing scores achieved for each of the tasks were homogenized into a percentage; in doing so, picture-cued writing and speeded dictation tasks were scored analytically using Pica's (1991) Target Language Use (TLU) formula (see below). To do that, Noun Phrases (NPs) were identified to determine obligatory contexts, and to further check if articles were supplied and whether they have been done correctly. This is while sentences were also scanned to detect articles in nonobligatory contexts.

$$\frac{n \text{ correct suppliance in contexts}}{n \text{ obligatory contexts} + n \text{ suppliance in nonobligatory contexts}} \times 100 = \text{percent accuracy}$$

Once participant performances were homogenized into percentage scores, for each participant, mean scores were calculated for each instance of test administration to calculate an average score that represented their performance on all three tasks. This also enabled correlational analysis of short-term and long-term gain scores through subtraction of mean pretest scores from mean immediate posttest scores and mean delayed posttest scores, respectively. To facilitate calculation and analysis of the data, SPSS software version 22 was used.

Results

Once scores on all tasks were homogenized, group means and standard deviations were first computed (See Table 2 and Figure 1). As is evident in Table 2, group Means (M) and Standard Deviations (SD) for the total of three tasks on all three testing occasions are calculated. Given the homogeneity of the participants in this study, there are small differences across the three groups on the pretest (M = 66.31, SD = 8.88; M = 64.79, SD = 7.48; and M = 67.97, SD = 5.13). As can also be seen in Figure 1, the direct CF group shows a considerable difference with other two groups as they have demonstrated much better performance on immediate posttest; this is while the metalinguistic CF group exhibited a less rapid upward trend. Thus, given the slight decline in direct CF group's delayed posttest performance compared to their immediate posttest performance (see Figure 1), the difference with the metalinguistic CF group is eliminated on the delayed posttest. However, the control group has shown a relatively unchanged performance trend on the three testing occasions; hence, both treatment groups show some differences with the control group at third testing occasion (M = 70.86, SD = 7.31; M = 71.05, SD = 9.91; and M = 67.40, SD = 6.96). The changes across the three groups through the pretest, immediate posttest and delayed posttest were examined by using Analysis of Variance to assess their significance and meaningfulness.

Table 2
Group Mean Scores and Standard Deviations for Total Test Scores

	Pretest		Immediate Posttest		Delayed Posttest	
	M	SD	M	SD	M	SD
Direct-only group (n = 23)	66.31	8.88	74.78	8	70.86	7.31
Metalinguistic group (n =20)	64.79	7.48	68.86	10.35	71.05	9.91
Control group (n = 14)	67.97	5.13	68.07	6.43	67.40	6.96

The first research question

In responding to the first research question, which focused on whether written CF has any effects on EFL learners' language performance, a one-way ANOVA of the total Mean scores was conducted; it shows that differences between groups at pretest and delayed posttest are not significant: F (2, 54) = 0.72, $p > 0.49$; F (2, 54) = 0.98, $p > 0.38$, respectively, suggesting there are between-group differences at delayed posttest and pretest. However, Table 3 shows that group differences at immediate posttest are statistically significant: F (2, 54) = 3.66, $p < 0.03$.

Table 3
One-way ANOVA for Total Mean Scores

		df	Mean Square	F	Sig.
Pretest.M	Between Groups	2	42.010	.721	.491
	Within Groups	54	58.242		
	Total	56			
Posttest.M	Between Groups	2	270.360	3.662	.032
	Within Groups	54	73.821		
	Total	56			
Delayed.M	Between Groups	2	66.932	.983	.381
	Within Groups	54	68.071		
	Total	56			

Additionally, as ANOVA does not show where exactly the differences lie, pairwise multiple comparisons were conducted through a post hoc test using Fisher's Least Significant Difference (LSD) method, which demonstrated more revealing results. As in previous findings, no significant differences were found on the pretest and delayed posttest. However, on the immediate posttest, group means on direct-only and metalinguistic groups are significantly different at the $p = 0.02$ level; average scores on direct-only and control groups also show a significant difference at the $p = 0.02$ level, while no significant difference was found between the metalinguistic group and the control group ($p = 0.79$). The findings demonstrated through multiple comparison methods illustrated in Figure 1 suggest that the overall scores on pretest show little difference among the three groups. On immediate posttest, however, direct-only group outperformed both metalinguistic and control groups. Moreover, both treatment groups outperformed the control group on the delayed posttest, although their difference was not statistically significant. Direct-only group has improved drastically in posttest but sharply declined in the delayed posttest. However, the metalinguistic group has steadily improved both in posttest and in the delayed posttest.

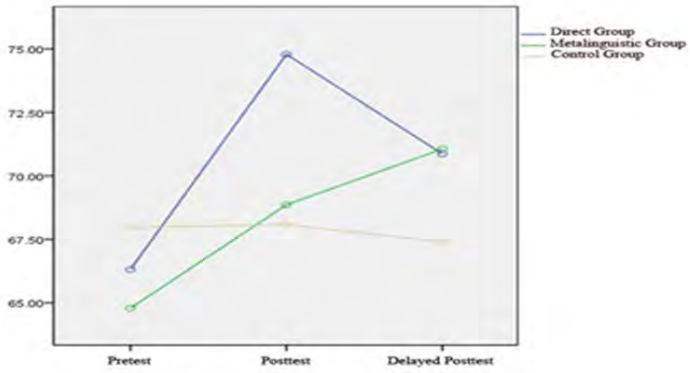

Figure 1. Total Test Scores

The second research question

To answer the second research question focusing on the effect of adding metalinguistic explanations to direct written CF, a one-way repeated measures analysis of variance (ANOVA) was conducted to evaluate learner gains through the treatment procedure (see Table 4). The

results indicated that while the control group did not show any significant gains through time (Wilks' Lambda = 0.89), the two treatment groups demonstrated some intervention effect on posttest scores. Accordingly, the metalinguistic group showed significant gains through three testing periods: Wilks' Lambda = .59, F (2, 18) = 6.16, $p < 0.009$; more importantly, there is a significant effect for the direct-only group: Wilks' Lambda = .34, F (2, 21) = 19.97, $p < 0.001$.

Table 4
Multivariate within-subject Tests through Wilks' Lambda

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power
Time	Direct-only group	.34	19.97	2.00	21.0	.001	.65	39.94	1.00
	Metalinguistic group	.59	6.16	2.00	18.0	009	.40	12.32	.83
	Control group	.98	.11	2.00	12.0	.89	.02	.22	.06

Follow-up pairwise comparisons also demonstrated no gains for the control group on both immediate and delayed posttests: $p > 1.00$, and $p > 1.00$, respectively. However, the comparisons indicated an increase in scores over time for both treatment groups, yet some of them were not statistically significant. Accordingly, pretest and immediate posttest comparison for the direct-only group suggests a significant increase in learner scores as a result of the intervention: $p < 0.001$. Although this group demonstrates longer-term gains as well, the pretest and delayed posttest comparison does not show a statistically significant gain: $p > 0.06$. The finding shows direct correction is not effective for short-term gains.

Pairwise comparisons for the metalinguistic group demonstrated opposite results to the direct-only group. Although increases in learner scores on both posttests can be observed, the findings suggest no statistically significant gains in a short-term period: $p > 0.06$, while long-term gains can be observed for the metalinguistic group as the significance score on the pretest and delayed posttest comparison suggests: $p < 0.006$. Diverse short-term and long-term outcomes for the direct only and the metalinguistic groups indicate divergent effects for the two CF techniques employed for each of the treatment groups.

The third research question

The third research question concerns the assessment of the relationship between learners' LAA and the two types of written CF provided; the relationship between LAA scores and gain scores (short-term and long-term) for each of the treatment groups were investigated. The Pearson product-moment correlation coefficient with a two-tailed prediction was used, as it was not known whether there would be positive or negative correlations (Table 5). For the direct-only group, a negative correlation was found between short-term gain and language analysis scores; however, the *p*-value suggested that this correlation was not statistically significant: $r = -.154$, $n = 23$, $p > 0.48$. The long-term gain for the direct-only group demonstrated a positive correlation with LAA scores, though they were not statistically significant either, $r = .105$, $n = 23$, $p > 0.63$.

Table 5
Total Gain Score Correlation with LAA Scores

Total Gain		Language Analytic Ability (*r*) Direct-only group	Metalinguistic group
Short-term	Pearson Correlation	-.154	.625
	Sig. (2-tailed)	.484	.003
	N	23	20
Long-term	Pearson Correlation	.105	.629
	Sig. (2-tailed)	.633	.003
	N	23	20

Both short- and long-term gain scores in the metalinguistic group show positive correlations with LAA scores, meaning that their language analysis score is predictive of their gains from the intervention through metalinguistic information. Table 5 shows both correlation coefficients for metalinguistic CF group, both being statistically significant: $r = .62$, $n = 20$, $p < 0.003$ for short-term effects and $r = .629$, $n = 20$, $p < 0.003$ for long-term effects; the two correlation coefficients for this group show little difference over time.

Additionally, the Pearson correlation tests for each of the tasks conducted in this study provided us with further information. Accordingly, both short- and long-term gain scores for the writing task showed negative correlations with direct-only group LAA scores, while for the metalinguistic group, this correlation is seen to be positive. However, none of the correlations for writing task is statistically significant. Error correction task gain scores demonstrated both short- and long-term positive correlations for both groups. Only long-term gain scores on error correction task for the metalinguistic group exhibited positive correlations with their LAA scores in a statistically significant manner: $r = .64$, $n = 20$, $p < 0.002$.

Furthermore, the Pearson correlation output matrix also indicates negative values for both short- and long-term gain scores on dictation task for the direct-only group, yet they are not statistically significant. However, highly positive correlations are exhibited for the metalinguistic group on both gain scores for dictation task. Both short-term and long-term gains were highly related to LAA performance for the metalinguistic group: $r = .73$, $n = 20$, $p < 0.001$; and $r = .70$, $n = 20$, $p < 0.001$, respectively. Hence, with effects noted on dictation task, the strong positive correlations observed suggest that learners with higher LAA could make better use of metalinguistic explanations.

Discussion

In light of the debates on the effectiveness of written CF practices in the second language writing literature (Ferris, 2010; Karim & Nassaji, 2020; Truscott, 1996, 2004), the current study concentrates on EFL learners' performance before and after receiving written CFs by employing an experimental design. Similar to many of the earlier studies (e.g., Bitchener, 2008; Ellis, Sheen, Murakami, & Takashima, 2008; Jiang & Xiao, 2014; Sheen, 2007; Sheen, Wright, & Moldawa, 2009; Yang & Lyster, 2010), the results of this study also suggest a place for written CF through assessing the overall effect it has on learner performances. Unlike language learners in the control group, the learners provided with written CFs in the two treatment groups exhibited improvements in second language performances concerning English article system. The results of this study are in agreement with the findings of previous studies (Bitchener, 2008; Bitchener & Knoch, 2008, 2009; Sheen, 2007; Stefanou & Revesz, 2015) in showing an overall difference between treatment and control groups, and confirm a positive effect for those receiving CF treatment.

Following the overall positive effect for written CF that has been shown by our results above, the two ways of providing direct written CF have been scrutinized and the results demonstrated different gain patterns for each group, which suggests that learners undergoing each feedback technique are led into diverse feedback processing paths. These findings are in line with a number of research studies (Bitchener, 2008; Bitchener & Knoch, 2009; Jiang & Xiao, 2014; Sheen, 2007) in that there was a significant short-term difference between the direct-only and the control group; yet, unlike these studies, the results do not show long-term effects for direct-only error correction. Unlike the performance exhibited by the direct-only CF group, a significant long-term difference can be observed between the performance demonstrated by learners who received

metalinguistic information and those learners that did not receive feedback on their article errors. However, the short-term differences between the metalinguistic group and the control group were not statistically significant. In other words, the results of the current research showed the significant short-term difference between the two treatment groups receiving different CFs, which softly resembles the kind of results achieved by Bitchener and Knoch (2009) and Jiang and Xiao's (2014) studies.

As it has been presented earlier, learners receiving direct-only CF exhibited significant post-treatment improvements that did not last until the delayed post-test, while those receiving metalinguistic information on top of direct feedback seemed to have used the time gap between the two post-tests to process the feedback further and eventually compensate for their negligible short-term improvements. The continuous improvement through time for learners receiving metalinguistic comments is in line with the majority of studies conducted on written CF (Bitchener, 2008; Bitchener & Knoch, 2009; Sheen, 2007; Stefanou & Revesz, 2015). However, the findings of this study regarding metalinguistic comments are different from other studies in that learners receiving such comments did not demonstrate significant short-term improvements in their performance.

This also goes against the findings by Shintani and Ellis (2013), who observed only short-term effects for metalinguistic information. However, they did not provide CF to learners receiving metalinguistic information, allowing them to only check their own writings with the information they were provided with. The eye-tracking results in their study suggest that learners receiving direct-only error correction spent less time reflecting on errors and stimulated recall data also confirmed this as learners pointed out they were unable to understand the corrections. Such observations put together with the findings of the current study may suggest a temporary role for learners' memory in their short-term performance when receiving direct CF without any metalinguistic information.

Finally, this study aimed to refocus on learners' LAA to explore their gaining potentials from the correction of their writing errors, while considering the diverse conclusions drawn from the two studies by Sheen (2007) and Jiang and Xiao (2014). The former of these studies found more positive correlations between learners' LAA and direct CF with metalinguistic information, while the latter found more positive effects for direct CF without metalinguistic information. Accordingly, learners' LAA in the current research were correlated with their short- and long-term gains in both treatment groups. For both treatment groups, no significant correlation was found between short-term performance and LAA, though learners' short-term performance was negatively related to their LAA when receiving direct-only correction; this means that those with higher LAA performed weaker on the posttest immediately following treatment in the current research. Such findings are quite interesting in light of the earlier observations where direct-only CF showed positive short-term effects in terms of learner gains.

However, for learners receiving direct-only correction accompanied by a metalinguistic explanation, the short-term performance was positively related to their LAA, which is also statistically significant. The long-term correlation coefficient for this group shows little difference in their performance in comparison to their short-term scores. In other words, learners' LAA was predictive of their performance when receiving direct-only CF with metalinguistic information both in the short and long runs. A comparison of two earlier studies with the current research demonstrates a similar overall pattern, where LAA is generally more predictive of learner performance in the long run. Thus, the findings of this study suggest a preference for metalinguistic information provision to learners with higher LAA, while no meaningful relationship was found between direct CF and LAA. This is in contrast with Shintani and Ellis (2015) who maintain that in the absence of post-feedback revision, which is also the case in our study, direct feedback and metalinguistic explanation had 'moderate' and 'weak' effects,

respectively. However, it must be noted that even though the direct CF groups in both studies underwent similar feedback provision processes, the groups that received metalinguistic explanations in both studies were different in that Shintani and Ellis (2015) only provided a metalinguistic explanation with no direct CF.

Conclusion

The results of this research suggest that while both treatment groups receiving different CF types performed similarly on the last testing occasion, the direct CF with a metalinguistic explanation might be a more promising method of error correction as their gain scores show an ascending pattern. Contrary to this CF type, the group receiving direct-only CF outperformed other groups on the first post-treatment test, yet their performance did not manage to stand the test of time, leading to the speculation that if they were tested after a much longer period, they might not have even exhibited any overall gains through receiving direct-only CF.

One possible explanation for such findings is that when direct-only CFs were provided, in the absence of any further input they resorted to memories of corrections provided in the previous week, without actually understanding the reason for such substitution. As the memories gradually faded away, they failed to perform as well in delayed assessment four weeks later. On the contrary, in the immediate assessment, the metalinguistic group failed to show a significant change from initial assessment, perhaps due to their engagement with the metalinguistic information and the underlying processes that were trying to make such information applicable to the new testing occasion. However, the third assessment with a five-week delay from CF treatment demonstrated a much more significant gain for metalinguistic CF group as such a correction method resulted in the desirable noticing and awareness, which as Sheen (2007) suggested led to understanding.

Such a conclusion is also supported by correlation coefficients between LAA and metalinguistic CF group performance; it suggests learners with stronger analytic abilities performed equally well on both immediate and delayed assessment points. Yet, a consideration of learners' LAA may at first suggest that direct-only CF is perhaps a better error correction method for analytically weaker learners, although the longer-term effects could be interpreted as more in favor of more analytically able learners; however, one must be cautious in drawing such a conclusion from two statistically insignificant correlation coefficients. This implies that learners, who have stronger LAA, benefit more from direct CF accompanied by metalinguistic information. The results also suggest that such a benefit is not subject to time-related limitations, as the significant positive correlations remained almost unchanged over time.

In sum, as Shintani and Ellis (2015, p. 14) rightly identified, "the depth of processing demanded" by the feedback determines the "relevance of LAA" to the task in hand. The findings of this study favor the provision of metalinguistic input when direct written CF is provided in response to learner errors. We argue that by increasing the demand for further processing of the errors and the feedback they received, learners are more likely to employ more cognitive resources to achieve learning objectives that are highlighted by the instructor responses. The results presented in this study make it clear that learners with higher LAA enjoy greater language development when provided with metalinguistic input.

The scope of this study, however, falls short of identifying strategies to tackle learning obstacles for learners with lower LAA. By focusing on learners with lower LAA, further studies can improve our understanding of their language learning and development while also enabling the

identification of strategies for feedback provision. This study was also limited in terms of the gender (using only females) and the number of participants that were available. Further studies with larger number of participants may provide more conclusive results. Another common limitation of studies of this type and scope is their narrow focus on a single target structure. Studies on other grammatical structures will prove highly informative and will give us a deeper understanding of the aspects involved in language development. Furthermore, this study only examined the mediating effect of LAA on language development when provided with direct written corrective feedback. Future research may prove enlightening if they also focus on indirect techniques for error correction while considering learners' LAA.

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Appendix 1

Language Analysis

Name: _____ Date: _____

The list in the box below contains words/phrases from an **imaginary language** along with their English translation. Following this, there will be 14 short English sentences, each with four possible **translations** into the imaginary language. Based on the examples given in the box, please try to work out which of the four options is the correct translation of each sentence. You can only choose **One** translation for each English sentence

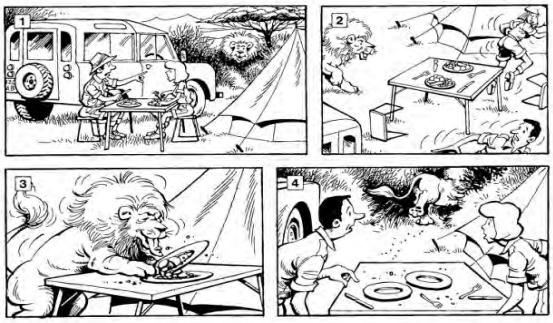
kau	dog	**pa**	we, us
meu	cat	**xa**	you
kau meud bo	The dog is chasing the cat.	**pasau meud bo**	Our dog is chasing the cat.
kau meud bi	The dog was chasing the cat.	**pa meud bo**	We are chasing the cat.
so	watch	**paxbo**	We are chasing you.
ciu	mouse	**pa meud bor**	We aren't chasing the cat.

1. **The dog is watching the cat.**
   a. kau meud so b. kau meud si
   c. meu kaud so d. meu kaud si
2. **The cat was watching the mouse.**
   a. meud ciu so b. meu ciud so
   c. meud ciu si d. meu ciud si
3. **You are watching us.**
   a. paxbo b. paxso
   c. xapbo d. xapso
4. **You were chasing the dog.**
   a. xa kaud bo b. pa kaud bo
   c. pa kaud bi d. xa kaud bi
5. **We were watching you.**
   a. xapsi b. paxso
   c. paxsi d. paxbi
6. **You are not watching the cat.**
   a. xa meud bor b. xa meud sor
   c. xa meud sir d. xa meu sor
7. **You are not chasing us.**
   a. paxbor b. xapbo
   c. xapabor d. xapbor

8. **We were not watching the dog.**
   a. pa kaud sir b. pa kau sir
   c. pa kaud sor d. pa kaud bir
9. **We were not chasing you.**
   a. xapbir b. paxbir
   c. paxbor d. xapbor
10. **Your cat is chasing the mouse.**
    a. xacu meud bo b. xaseu ciud bo
    c. meuxa ciud bo d. ciuxa meud bo
11. **You are not watching our dog.**
    a. xa paseud bor b. xa pasaud sor
    c. xa pasaud so d. xa pasaud bor
12. **Our mouse was not chasing the dog.**
    a. oasiu kaud bi b. xasiu kaud sir
    c. xasiu kaud bi d. pasiu kaud bir
13. **Your mouse is chasing us.**
    a. xa ciu pabo b. xasiu pbo
    c. xaciu pa bo d. xasiu pabo
14. **Our cat was not chasing your dog.**
    a. pseu xasaud bir b. pseu xsaud bir
    c. paseu xasaud bir d. paseu xsaud bir

Appendix 2

Writing task



Look at the four pictures above carefully. The order in which they happen is indicated by a number from 1 to 4. Imagine you are one of the two characters in the picture and this is your story. In about 10 minutes time, write as much as you can about the incident. You can make use of the following questions and words to get ideas for your story writing.

Where were you at the time?
How did you go there?
What were you carrying?
What did you see? And what happened?
What were you doing when that happened?

Useful words:

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