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**The Effects of Direct Corrective Feedback and Metalinguistic
Explanation on EFL Learners' Implicit and Explicit Knowledge
of English Definite and Indefinite Articles**

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Abstract

This study investigated the effects of two types of written feedback – direct corrective feedback (DCF) and metalinguistic explanation (ME) - on Iranian EFL learners' implicit and explicit knowledge of English definite and indefinite articles. Assigned to three groups of DCF, ME, and control groups, the participants took four tests in three testing phases: pretest, posttest, and delayed posttest. Four testing instruments measured the two knowledge types: narrative writings, speeded dictation, untimed grammaticality judgment, and error correction tests. Results indicated that both treatments were effective in the immediate posttests. However, the ME proved to have longer lasting effects than the DCF as the improvement of both knowledge types were sustained after a three week period in the ME group. According to the obtained findings, it is argued that the description of the rules and the examples given explicitly in a ME handout might be more beneficial in promoting learners' implicit and explicit knowledge of English articles than the DCF.

Keywords: direct corrective feedback, metalinguistic explanation, implicit and explicit knowledge, English definite and indefinite articles, L2 writing

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Introduction

While written corrective feedback (CF) is considered as an essential instructional strategy in second language (L2) writing classroom by many, it has been much investigated and hotly debated over the past 15 years (Ferris, Liu, Sinha, & Senna, 2013). There has been a surge of interest in the efficacy of CF since the publication of Truscott's (1996) controversial article in *Language Learning* about the destructive effect of CF on learners' writing. Subsequently, a substantial amount of research has been conducted over the last decade and opinions have been voiced about whether CF can be effective in L2 writing (e.g., Bitchener, 2008; Bitchener & Knoch, 2008; 2009; 2010a; 2010b; Diab, 2015; Ferris, 2012; Kang & Han, 2015; Ruegg, 2015; Sheen, 2007; 2010; Shintani & Ellis, 2013; 2015; Shintani, Ellis, & Suzuki, 2014; Junqueira & Payant, 2015; Van Beuningen, De Jong, & Kuiken, 2012).

There is now increasing empirical evidence that CF can improve grammatical accuracy in new pieces of writing (Shintani, et al., 2014). But, from the SLA perspective, the question is whether an accurate use of the L2 which is resulted from learner's explicit knowledge can be regarded as a measure of acquisition. Manchon (2011) makes a distinction between 'feedback for accuracy' and 'feedback for acquisition'. From a broader point of view, Reichelt (2001) suggested a different approach towards L2 writing in which writing is introduced as a tool to foster L2 learning instead of only being viewed as an end in itself. In a similar vein, Manchon (2011) pointed out two crucial dimensions of the theory and research in the field of L2 writing namely, the 'learning-to-write' and 'writing-to-learn' aspects. The latter dimension involves learner's engagement in the written practice which can result in acquiring competences in an L2. Similarly, written CF has the potential to positively influence L2 learning and development (Bitchener, 2012). This issue can further be investigated if we discover whether CF promotes only the explicit knowledge or it can also develop the implicit knowledge. Respectively, Polio (2012) emphasizes that it is crucial to begin a research agenda examining the role of implicit and explicit knowledge in writing. The current study aimed to commence such an agenda.

Scholars in the field of L2 writing argue that CF can only tap into learners' explicit knowledge. Truscott (1998), for example, notes that although grammar error correction can contribute to the explicit knowledge required for monitoring and revising the texts, it basically overlooks the "genuine knowledge of language" (Truscott, 1998, p.120) which can facilitate L2 development (i.e., implicit knowledge). Similarly, Bitchener (2012) pointed out that written CF can lead to the development of explicit knowledge. Likewise, Polio (2012) expected that written CF will improve the explicit knowledge. But the fact is that we only know that CF can play a role in terms of developing the accuracy in writing. We are not sure whether this is for the reason that it contributes to explicit knowledge or implicit knowledge (Shintani & Ellis, 2013). Although it is likely that learners draw upon both types of knowledge when writing, it remains an empirical question whether the knowledge gained from CF is implicit or explicit in nature (Bitchener & Knoch, 2010a). The study reported below is intended to address this point by examining the differential effects of two CF types – direct corrective feedback (DCF) and metalinguistic explanation (ME) – on Iranian EFL learners' implicit and explicit knowledge of English definite and indefinite articles.

Literature Review

Theoretical Background

There are several theoretical grounds for arguing that CF can be beneficial to language learning. Bitchener (2012) referred to four SLA theories, namely Krashen's monitor model, skill acquisition, interaction, and socio-cultural theories, all of which can explain the role of written CF in L2 learning and acquisition. Among these positions, Krashen's monitor model and skill acquisition theory are mentioned below since they are related to the role of implicit and explicit knowledge in L2 learning.

Krashen (1985) makes a distinction between 'acquisition' and 'learning' and argues that CF has no role in developing learners' implicit or procedural knowledge i.e., acquisition. However, Krashen claims that CF can be beneficial in developing learners' explicit knowledge i.e., learning. Contrary to Krashen's view that explicit and

implicit knowledge are completely distinct, skill acquisition theory states that there is an interface linking implicit and explicit knowledge and that learning includes a transfer from controlled towards automatic processing. For instance, DeKeyser (2003) accommodates the interface view that the gap between explicit knowledge and implicit knowledge can be bridged by output practice and instruction (which can also include written CF). In addition, drawing on this theory, Ellis (2010) asserts that CF can contribute to the proceduralization of explicit L2 knowledge and therefore to learning. Feedback is also valuable since it can hinder learners to proceduralize incorrect language.

Turning to empirical studies, there is now a substantial body of L2 writing research regarding the effect of written CF on learners' revision and editing skills. According to Manchon (2011), this bulk of research focused on feedback for accuracy but not on feedback for acquisition. As it is evident in Kang and Han's (2015) meta-analysis, previous L2 writing researchers demonstrated that CF developed the accuracy of learners' written texts but, the fact is that the ability to revise a text cannot be an evidence of learning. Polio (2012) states that in L2 writing research very little is known about whether written CF is beneficial, harmful, or ineffective for language learning; while, SLA research on oral CF has provided convincing evidence that oral CF facilitates the acquisition in oral productions (see Ellis & Shintani, 2013; Kamiya, 2015; Shintani, 2015). Although noticeable differences exist between oral and written CF, there are, as mentioned above, theoretical possibilities with regard to the language learning potential of written CF.

Insisting on the importance of considering the SLA theories in discussions of written CF, Polio (2012) further reasons that "we should consider conducting more studies guided by some of the specific approaches to SLA and develop a research agenda guided by SLA theory" (p. 376). To date, only one study (Shintani & Ellis, 2013) has attempted to investigate whether written CF can assist the development of explicit and implicit knowledge of English articles. Given the lack of empirical evidence on this issue, it is necessary to

examine whether written CF can develop explicit, implicit, or both knowledge types.

Types of written CF

Another issue in the study of CF is examining whether certain types of CF are more beneficial in L2 learning and development. Early studies have most often considered the dichotomy between direct (explicit) or indirect (implicit) CF. The former can be defined as the provision of the correct linguistic form above the linguistic error in the text. The latter involves indicating that an error has been made without drawing any explicit attention, such as underlining the error or mentioning the number of errors in the margins (Ferris, 2003). A growing but far from conclusive body of research studies has attempted to compare the relative effects of indirect and DCF. Contrary to SLA studies which reveal that direct feedback is more influential than indirect feedback in L2 development (Bitchener & Knoch, 2010a; Ferris & Roberts, 2001; Frear, 2012; Junqueira & Payant, 2015; Van Beuningan et al., 2012), some L2 writing studies found that indirect feedback can cause either greater or similar levels of accuracy in the written texts (Bitchener & Ferris, 2012; Chandler, 2003; Guenette, 2007; Ferris, 2006; Ferris and Hedgcock, 2005; Ferris & Helt, 2000). However, since these studies operationalized the two categories of CF differently, it is perhaps not surprising that they led to inconclusive results.

More recently, studies have focused on an additional form of direct feedback which includes written Metalinguistic Explanation (e.g., Bitchener & Knoch, 2008; 2010b; Bitchener, Young, & Cameron, 2005; Diab, 2015; Sheen, 2007; Shintani & Ellis, 2013; 2015; Shintani, et al., 2014). This type of CF consists of explicit explanations of grammatical rules and the provision of target-like examples where the error has occurred. Among the studies which investigated this form of ME, two studies reported no significant differences for the inclusion of ME (Bitchener & Knoch, 2008; 2010b) and three studies reported that ME was beneficial (Diab, 2015; Bitchener et al., 2005; Sheen, 2007). According to Ellis, Sheen, Murakami, & Takashima (2008), comparing direct and ME has greater theoretical and practical significance when viewed from the

perspective of SLA theory. Moreover, the distinction between these two feedback types has been little investigated.

In a series of studies Shintani and her colleagues utilized a new kind of ME (as in the current study) which took the form of a written handout explaining the use of the target grammatical forms. Shintani and Ellis (2013) compared the effect of direct written CF and ME on learners' explicit and implicit knowledge of the English indefinite article. They found that DCF benefited neither implicit nor explicit knowledge and ME helped to develop learners' L2 explicit knowledge but had no effect on their implicit knowledge. In another study, Shintani et al. (2014) investigated the impacts of direct written CF and ME on Japanese university students' accurate use of indefinite article and the hypothetical conditional in new pieces of writing. They reported that the DCF followed by revision was the most effective type of feedback and its effect lasted longer than the ME. Moreover, they found that DCF was more beneficial than ME when the focus was on hypothetical conditional, i.e., when a more complex syntactical structure was targeted. More recently, Shintani and Ellis (2015) designed a correlational study to examine whether language analytical ability mediated learners' performance while receiving DCF and ME treatments. It should be noted in passing that in the current study ME took the same form as in the three aforementioned studies.

As reviewed above, research has not been able to produce consistent findings with regard to the differential effects of written DCF and ME. However, this is also dependent upon the focus of the feedback provided. The distinction between focused and unfocused feedback is another issue in CF studies. It is only recently that researchers (e.g., Bitchener & Knoch, 2009, 2010a, 2010b; Ellis et al., 2008, 2014; Shintani & Ellis, 2013; 2015) have started to investigate whether written CF can effectively focus one or two linguistic error categories (e.g., definite and indefinite articles, regular and irregular past tense, hypothetical conditional). However, as claimed by Ferris et al. (2013), due to the precision of these recent studies, we can conclude that focused written CF is more valuable than unfocused written CF. Nevertheless, another question is that which error categories are more responsive to focused written CF.

Considering this very limited amount of research on few linguistic structures, it is too early to make any conclusion or pedagogical advice regarding the learning potential of the CF which is directed at certain forms and structures. According to Bitchener (2012), “it may be that discrete rule-based items can be more effectively targeted with written CF than complex error categories can be but, until we empirically test these different categories, we can only talk about theoretical possibilities” (p. 357). Therefore, it would be of great interest to investigate which type of direct focused feedbacks (i.e., DCF or ME) can be more beneficial to the acquisition of certain types of linguistic errors e.g., English definite and indefinite articles.

To sum up, while there is clear support for the claim that written DCF can assist learners in improving their linguistic accuracy (Kang & Han, 2015), there is only one study to date that has attempted to show whether it contributes to the development of explicit knowledge or implicit knowledge of the target structures (i.e., Shintania & Ellis, 2013). As mentioned by Shintania and Ellis (2013) their study lacks the acceptable kinds of testing instruments used by SLA researchers to assess implicit knowledge. In addition, the participants in their study were all low-proficiency learners. Therefore, following the skill acquisition framework, the present study is designed to investigate the differential effects of written CF and ME on Iranian intermediate EFL learners’ implicit and explicit knowledge of definite and indefinite articles.

The current study

Considering the aforementioned issues, the purpose of this study was to investigate the differential effects of DCF and ME on Iranian EFL learners’ implicit and explicit knowledge of English definite and indefinite articles. Consequently, the current study addressed the following research questions.

Q1. Does DCF have any effect on Iranian EFL learners’ explicit and implicit knowledge of the English definite and indefinite articles?

Q2. Does ME have any effect on Iranian EFL learners’ explicit and implicit knowledge of the English definite and indefinite articles?

Q3. Is there any significant difference between DCF and ME in terms of their effects on Iranian EFL learners' explicit and implicit knowledge of the English definite and indefinite articles?

Since there was not enough empirical evidence for formulating directional hypotheses, the following null hypotheses were formulated based on the research questions of this study.

H₀₁: DCF does not have any effect on Iranian EFL learners' explicit and implicit knowledge of the English definite and indefinite articles.

H₀₂: ME does not have any effect on Iranian EFL learners' explicit and implicit knowledge of the English definite and indefinite articles.

H₀₃: There is not any significant difference between DCF and ME in terms of their effects on Iranian EFL learners' explicit and implicit knowledge of the English definite and indefinite articles.

Method

Participants

Ninety-four undergraduate English translation majors enrolled in several EFL courses at a private university in Iran took part in this study voluntarily. Participants were both male and female first-year students and their ages ranged from 18 to 30. These intermediate-level learners were selected out according to their aggregate scores on an Oxford Placement Test measuring grammar (20 items), vocabulary (20 items), reading comprehension (20 items) and L2 writing. Three intact classes, taught by the same instructor, were considered as the three groups of the study: Group 1 received DCF, group 2 received ME, and group 3 (i.e., the control group) did not have an opportunity to practice the target structures and, thus, received no feedback. It should be noted that the total number of students was 147 in the three classes, among which only the data referred to the intermediate-level learners were considered for the analysis (N = 94). The data were gathered during scheduled class times by the course tutor.

Design

This quasi-experimental study employed a pretest – treatment – posttest – delayed posttest design with a control group. Three intact EEL classes were arbitrarily assigned to three groups: the DCF, the ME, and the control. The target structures under investigation were English definite and indefinite articles. Narrative writing tasks and a Speeded Dictation Test (SDT) were used to assess implicit knowledge and an Untimed Grammaticality Judgment Task (UGJT) and an Error Correction Test (ECT) were employed to measure learners' explicit knowledge. Following Kamiya (2015), the narrative writing tasks and the SDT were administered prior to the UGJT and ECT so as to reduce learners' use of explicit knowledge on the implicit tests. Participants took all of the 4 tests, 3 times, in 3 class meetings (1st week: pretest, 2nd week: posttest, and 5th week: delayed posttest). The design of the study is presented below.

- Time 1 (pretest): Writing Task 1, SDT, UGJT, ECT
- Time 2 (posttest) : Treatment, Writing Task 1 + revision, Writing Task 2, SDT, UGJT, ECT
- Time 3 (delayed posttest) : Writing Task 3, SDT, UGJT, ECT

Target structures

In the current study, English definite and indefinite articles were chosen as the intended target structures. English article system was targeted for a number of reasons. First, focusing on specific linguistic errors has shown to be beneficial in recent feedback studies (e.g., Bitchener, 2008; Bitchener & Knoch, 2009, 2010; Ellis et al., 2008; Ellis & Shintani, 2013; 2015; Grey, Williams, & Rebuschat, 2015; Sheen, 2007, 2010; Sheen et al., 2009; Shintani et al., 2014; Kamiya, 2015). Second, using English articles is a very challenging task for the learners (Celce-Murcia & Larsen-Freeman, 1999), particularly for learners whose L1 does not contain articles, as was the case for the participants of this study. Third, an increasing amount of literature reflected that both high and low proficient learners encounter difficulty in using English articles (Bitchener, 2008, Bitchener et al., 2005; Ferris, 2006). Even advanced writers are faced with the dilemma of deciding whether an article is needed and, if it is, whether

it should be definite or indefinite (Bitchener & Knoch, 2009). Fourth, it is not possible to evade article usage in any genre of writing; therefore, it is essential for learners to use articles accurately in order to hand in a good quality writing task. Finally, the operationalization of the target structures lack consistency in previous research. Consequently, in order to widen the comparability of the results, English articles are preferred which were the most frequent targeted linguistic forms in previous CF studies (e.g., Bitchener & Knoch, 2009, 2010a, 2010b; Ellis et al., 2008; Ellis & Shintani, 2013; 2015; Sheen, 2007, 2010; Shintani et al., 2014).

Instruments

Metalinguistic explanation handout. The handout, taken from Shintani and Ellis (2013), included a clear description of the use of definite and indefinite articles. Earlier studies utilized oral or written individualized ME which was provided in response to each type of error in the same way as DCF (as in Bitchener, 2008, Bitchener & Knoch, 2010a, 2010b; Sheen, 2010). To the best of authors' knowledge, only three other studies (Shintani & Ellis, 2013; 2015; Shintani et al., 2014) investigated this kind of generic Metalinguistic Explanation that can be provided to the entire students.

Narrative writing tasks. Three picture compositions, taken from Byrne (1967), were used in the current study. Each task consisted of four pictures based on which learners were required to write a story in 20 minutes. These tasks were selected because they had potential to create contexts for the use of English articles and had been used frequently in earlier studies (e.g., Bitchener & Knoch, 2009, 2010a, 2010b; Ellis et al., 2006; Ellis et al, 2008; Sheen, 2007; 2010; Shintani & Ellis, 2013). Picture-cued narrative activities generate obligatory opportunities for the use of English articles because of the variety of objects, individuals and events demonstrated (Bitchener & Knoch, 2010b).

Following Shintani and Ellis (2013), narrative writing tasks were utilized in order to measure learners' implicit knowledge of the English articles. The writing tasks met Ellis' (2005) criteria for implicit knowledge tests, they did not necessitate awareness of the

target structure, the main focus was on meaning, they were time pressured, and task directions did not offer the implementation of metalinguistic knowledge.

The scores of the narrative writing tasks were computed as percentage of correct usage in obligatory occasions (Ellis & Barkhuizen, 2005). In order to calculate accuracy scores, the obligatory uses of the target structures were initially detected for each writing task. Subsequently, the accuracy score was determined as a percentage of correct usage. For instance, six correct uses from ten obligatory occasions indicated a 60% accuracy score for that writing task. The analysis of the written texts was carried out by the researcher and a research assistant and the inter-rater reliability coefficient was above .82.

Speeded Dictation Test (SDT). This test was primarily used by Sheen (2007, 2010) to assess learners' implicit knowledge of English articles. Although an elicited oral imitation task has frequently been used for this purpose in other studies, limitations in administering that kind of test hindered its implementation in the current research. Nevertheless, as for the narrative writing tasks, the SDT is predicted to measure the implicit knowledge since it satisfies the four principles stated by Ellis (2005). The calculated Cronbach's alpha for the SDT in the pretest was an acceptable reliability value of 0.79.

The SDT consisted of 14 items, each of which was comprised of one or two statements including a definite or indefinite articles. There were a total of 9 indefinite and 12 definite article stimuli in the SDT. Each student was given a small notebook, the teacher read the items with a normal pace while learners started to write down one item per page as fast as possible. In order to hinder learners from conscious working on the written sentences, they were asked not to refer back to the previous pages. Drawing on Sheen (2007, 2010), target-like use scores were calculated for the SDT items. Considering the overuse of the target form, this score was supposed to assess the knowledge of articles. As mentioned in Sheen (2007, p. 266), the formula for calculating the SDT accuracy score is as follows:

$$\frac{n \text{ correct suppliance in contexts}}{n \text{ obligatory contexts} + n \text{ suppliance in obligatory contexts}} \times 100$$

= percent accuracy

Untimed Grammaticality Judgment Test (UGJT). This was an adapted version of the test designed by Akakura (2012) to measure learners' explicit knowledge of the English articles. It was an untimed, 20-item, paper-and-pencil test which included 10 grammatical and 10 ungrammatical sentences. Following Kamiya (2015), each sentence was printed on a single page of a booklet and participants were not allowed to go back to the previously answered items. Test-takers were required to inspect the underlined segment of each sentence for grammaticality and indicate one of the four choices on the judgment scale with the coding: 1. correct, 2. probably correct, 3. probably incorrect and 4. incorrect. Moreover, learners were asked to correct ungrammatical sentences. Responses were scored dichotomously: correct and probably correct (1 point), probably incorrect and incorrect (0 points). In addition, unanswered items were counted as incorrect and the total score was reported as a percentage accuracy score. Besides, separate scores were calculated for grammatical and ungrammatical items bases on Ellis et al. (2009) and Akakura (2012), arguing that ungrammatical items can be a better measure of explicit knowledge. The Cronbach's alpha of the pretest in the current study was .751, which was higher than the reliability value of .706 reported in Akakura's (2012) study.

Error Correction Test (ECT).In order to achieve closer comparability of results, this test was the same as the testing instrument used in Ellis et al. (2008), Sheen (2007, 2010), and Shintani and Ellis (2013). 17 items were presented to the students, each containing two related sentences. One of the statements in each item contained an error and was underlined. There were 14 obligatory occasions in the underlined sentences and the rest were distractors. Learners were scored one point for supplying of an article in each of the 14 obligatory occasions. At the end, a percentage accuracy score was calculated. The obtained reliability value, calculated by

Cronbach's alpha, was 0.76, which was satisfactory for a test with 17 items.

Like the UGJT, this test was predicted to assess learners' explicit knowledge of articles since it could satisfy Ellis' (2009) criteria for a test of explicit knowledge. It required a high degree of awareness, was unpressured, emphasized attention on form, and entailed the use of metalinguistic knowledge of the target structure.

Procedure

In the first week, the participants in the 3 groups took the pretests: Writing Task 1, SDT, UGJT, ECT. One week later, the experimental groups received their respective feedback. Texts written by learners in the DCF group were provided by the corrections above each article error. Learners had 5 minutes to review the feedbacks on their writings (i.e., Task 1). They were then required to give back their Task 1 and start to rewrite it again within 20 minutes without accessing their previously composed Task 1. After they finished the rewriting, all materials were gathered and a new picture sheet was given to the learners, based on which they started to write a new story (i.e., Task 2). In the same session, the SDT, UGJT, and ECT were performed for the second time.

Regarding the ME group, ME handouts together with each learners' previously written text (untouched and without individual CF) were distributed among the learners in week 2. The content of the handout was read out loud by the researcher once and then students were supposed to look for the errors in their returned texts within 5 minutes. As for the DCF group, materials were collected and students were required to rewrite the story in 20 minutes without consulting to their original text or to the ME handout. Next, they were asked to do the posttests: Writing Task 2, SDT, UGJT, and ECT. In addition, learners in the control group did not receive any kind of feedback and took the four posttests only.

Three weeks later, the delayed posttests (i.e., Writing Task 3, SDT, UGJT, and ECT) were conducted in the WCF, ME, and control

groups. A couple of points are worth mentioning here: Firstly, the order of the items in SDT, UGJT, and ECT was randomized for the three testing times i.e., pretest, posttest, and delayed posttest. Secondly, learners' other instructors were asked not to teach the target structures during this research project.

Data Analysis

After entering the required data into SPSS (v. 22), a number of descriptive and inferential statistics were performed to answer the research questions of the study. First, descriptive statistics for each of the writing tasks, SDT, UGJT, and ECT were calculated separately in the three testing periods for the DCF, ME, and control groups. Second, in order to investigate the effectiveness of the two feedback types on the learners' implicit and explicit knowledge of English articles, pretest, posttest, and delayed posttest scores of each of the four tests in the three groups were subjected to a series of one-way Analysis of Variances (ANOVAs) and two-way repeated-measures ANOVAs. In the next step, to pinpoint the exact points in time where differences between the groups arose, Bonferroni's post hoc pair-wise comparisons were used when there was a significant time-group interaction effect. Afterwards, correlation coefficient r was utilized to compute the effect size of the pairwise comparisons. According to Cohen (1998), values of .1, .3, .5 were interpreted as small, moderate, and large effects, respectively.

Throughout the analysis, mean scores obtained from the four tests were considered as the dependent variables. In addition, the independent variables were the type of feedback (DCF, ME, No feedback) and the testing phases (pretest, posttest, delayed posttest).

Results

The first and second research questions addressed the effects of the DCF and ME, respectively. Additionally, the third research question addressed the comparative effects of the two types of feedback treatments on learners' implicit and explicit knowledge of English articles. In order to investigate the research questions, results are presented for each testing instrument separately. In doing so, the

descriptive statistics for each test is presented first. Afterwards, the results of the corresponding inferential statistical analyses are reported.

Results of narrative writing tasks

Table 1 below shows the descriptive statistics for the DCF, ME, and control groups at the three different testing periods. As explained previously, the scores of the narrative writing tasks were calculated as percentage of correct usage in obligatory occasions (see the instruments section).

Table 1

Descriptive statistics for accuracy scores of the narrative writing tasks

Group	N	Pretest		Posttest		Delayed posttest	
		M%	SD	M%	SD	M%	SD
DCF	31	49.42	31.81	65.21	28.64	55.32	25.54
ME	30	47.14	26.41	70.24	32.17	74.27	29.15
Control	33	51.07	25.34	53.97	28.54	53.12	33.21

As is clear in Table 1, while the three groups were very similar at the pretest, the DCF and ME groups significantly increased their accuracy at the first posttest. As illustrated in Figure 1, the mean score of the ME group on the delayed posttest is marginally higher than that of the immediate posttest. This indicates that learners were not only able to retain the improvement after receiving ME but also to enhance it slightly after three weeks.

A one-way ANOVA showed that there were no significant differences among the three groups on the pretest scores, $F(2, 94) = 5.14$, $p > .05$. A two-way repeated-measures ANOVA revealed that there were significant main effects for group, $F(2, 94) = 11.21$, $p < .05$, and time, $F(3, 94) = 32.14$, $p < .05$, and a significant time-group interaction, $F(7, 94) = 26.24$, $p < .05$. The interaction effect indicates

that the groups performed differently from each other over time and according to the treatments.

The post hoc pair-wise within group comparisons using the Bonferroni adjustment revealed that both the ME and DCF groups significantly improved from pretest to posttest. In addition, the difference between pretest and delayed posttest in the ME group was statistically significant with a medium effect size ($r = .41$). Although the ME group steadily increased throughout the three test times, the increase from posttest to delayed posttest did not reach significance. No other significant within group differences were found.

Between group comparisons for the immediate posttests showed that there were significant differences with large effect sizes between the two experimental groups and the control group: DCF ($r = .71$), ME ($r = .76$). For the delayed posttests, only the ME group was found to significantly outperform the control group with a medium effect size ($r = .34$). In addition, the differences between the ME and the DCF in the delayed posttests reached statistical significance ($r = .31$). These results suggested that learners in the ME group outperformed those in the DCF and control groups in the delayed posttest.

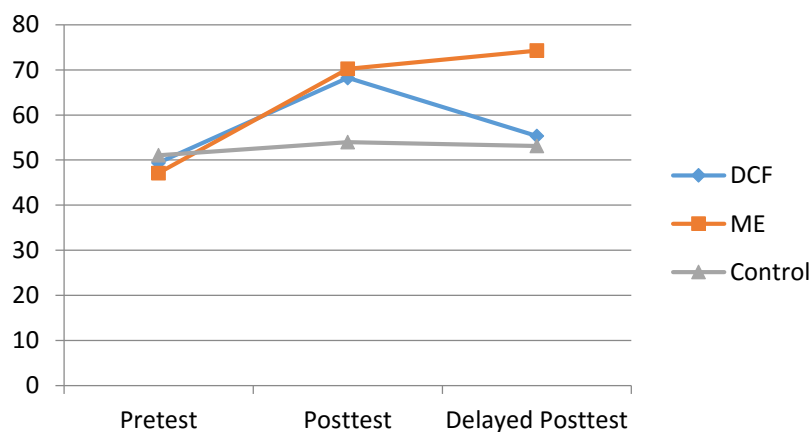


Figure 1. Mean percentage of the writing tasks

Results of the SDT

Table 2 presents the descriptive statistics for the scores on the SDT over the three testing periods. In addition, Figure 2 provides a visual representation of the mean percentages for each group in the three testing phases. As mentioned earlier, target-like use scores were calculated for the SDT items.

Table 2

Descriptive statistics for scores of the SDT

Group	N	Pretest		Posttest		Delayed posttest	
		M%	SD	M%	SD	M%	SD
DCF	31	50.61	18.24	58.21	17.24	53.28	16.85
ME	30	52.47	13.21	61.44	16.72	62.73	15.24
Control	33	49.17	16.85	52.41	15.26	51.19	14.62

Because a one-way ANOVA showed no statistically significant group differences in the pretests among the three groups, a two-way repeated-measures ANOVA was conducted to address the research questions. Results revealed that there were significant main effects for group, $F(2, 94) = 11.32, p < .05$, and time, $F(3, 94) = 32.27, p < .05$, and a significant time-group interaction, $F(7, 94) = 19.12, p < .05$. Bonferroni pairwise comparisons showed that, for the immediate posttest, the ME group ($r = .76$) and the DCF group ($r = .76$) outperformed the control group. In addition, there was no significant difference between the two experimental groups in the immediate posttests. As for the delayed test, however, only the ME group outperformed the control group ($r = .37$) and no other significant differences were found.

In addition, Bonferroni within group comparisons indicated that there were significant gains made by the DCF ($r = .65$) and ME ($r = .72$) groups from pretest to posttest and also from pretest to delayed posttest in the case of ME group ($r = .43$). Overall, both the ME and

the DCF treatments proved to be effective while the impact of the ME proved longer lasting than the DCF.

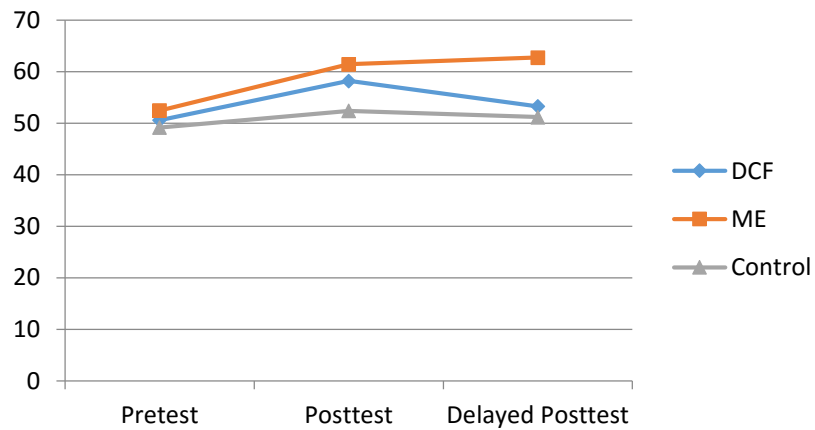


Figure 2. Mean percentage of the SDT

Results of UGJT

The means and standard deviations for grammatical, ungrammatical, and total scores derived from the UGJT over the three testing sessions in the three groups can be seen in Table 3 below. Besides, Figure 3 illustrates the UGJT total scores for the three groups under analysis across the three testing periods.

Table 3
Descriptive statistics for scores of the UGJT

Group	N	Pretest		Posttest		Delayed posttest	
		M%	SD	M%	SD	M%	SD
<i>Grammatical</i>							
DCF	31	28.24	15.24	37.69	19.52	30.47	17.29
ME	30	24.91	13.74	36.15	17.24	38.83	16.86
Control	33	29.77	19.27	30.85	23.28	33.28	25.09
<i>Ungrammatical</i>							
DCF	31	13.37	10.28	20.52	16.29	16.17	14.38
ME	30	13.93	8.85	22.16	12.68	24.29	13.02
Control	33	10.88	7.37	12.89	9.64	11.00	8.48
<i>Total</i>							
DCF	31	41.61	26.41	58.21	30.15	46.64	24.85
ME	30	38.84	23.72	59.31	27.12	63.12	29.16
Control	33	40.65	30.86	43.74	34.05	44.28	36.13

As shown in Table 3, scores obtained from the grammatical items are higher than that of the ungrammatical items among the three testing periods and in the three groups (see Figure 3). The general trend for greater grammatical scores is not surprising since learners were only required to check the grammatical items without any time limits (Kamiya, 2015). It should be noted that initially analysis procedures were done for each of the grammatical, ungrammatical, and total scores of the UGJT separately. Since these analyses led to same results for the three UGJT scores, only the findings with regard to the total scores are reported here.

At the beginning, in order to establish equivalency among the groups, a one-way ANOVA was performed on the UGJT pretest total

scores. The results indicated that there was not any significant difference between the groups in the pretests, $F(2, 94) = 8.29, p > .05$. Consequently, to run a two-way repeated measures ANOVA, the total scores were entered as the dependent variable with time (three levels) and feedback treatment (three levels) as independent variables. Results revealed significant main effects for feedback treatments, $F(3, 94) = 9.62, p < .05$, time, $F(2, 94) = 18.62, p < .05$, and significant interaction between time and feedback type $F(5, 94) = 6.68, p < .05$. The significant interaction effect suggests a differential increase in the scores over time according to the treatment conditions. To statistically check the differences between pairs of groups, post hoc multiple comparison tests were performed with Bonferroni adjustment.

Post hoc within group tests showed that the scores increased significantly from the pretest to posttest for the DCF ($r = .52$) and ME ($r = .76$) groups with large effect sizes. Moreover, the mean score of the ME group significantly increased from pretest to delayed posttest with a medium effect size ($r = .33$). Judging from the fact that the scores increased (although not significantly) from the pretest to delayed posttest even for DCF and control group, some of the score gains for ME group can possibly be attributed to the test effect.

Comparing the scores of the groups on the posttests via post hoc between group tests, significant differences were observed between feedback groups and the control group at the first posttest with large effect sizes (DCF $r = .63$, ME $r = .68$). In addition, The ME group significantly outperformed the DCF and control group at the delayed posttests with medium effect sizes ($r = .35$). In summary, both the DCF and ME group had significant improvements from the pretest to posttest, while only the ME group could retain that effect until the delayed posttest.

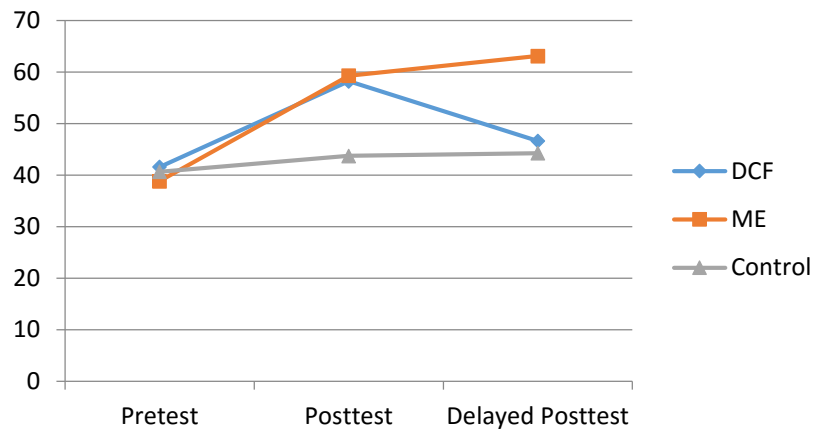


Figure 3. Mean percentage of the UGJT

Results of ECT

Table 4 displays the descriptive statistics for the accuracy scores on the ECT test which measured EFL learners' explicit knowledge of English articles over the three testing periods for the three groups of DCF, ME, and control. Additionally, the mean plot (Figure 4) illustrates how the students' scores on the ECT changed over time across the three groups.

Table 4

Descriptive statistics for scores of the ECT

Group	N	Pretest		Posttest		Delayed posttest	
		M%	SD	M%	SD	M%	SD
DCF	31	26.52	18.24	37.12	22.15	28.94	24.64
ME	30	29.07	19.32	43.24	24.24	45.27	20.57
Control	33	25.87	17.64	26.14	19.54	24.19	21.61

A one way ANOVA was performed to ascertain whether the differences in the three groups' scores on the pretests were statistically significant. This showed no statistically significant group differences among the DCF, ME and control groups, $F(2, 94) = 11.34, p > .05$. A two-way repeated measures ANOVA indicated that there were significant effects for group $F(2, 94) = 13.21, p < .01$, and time $F(4, 94) = 22.45, p < .05$, and also a significant time-group effect $F(6, 94) = 24.23, p < .05$. The post hoc pair-wise within group comparisons manifested significant gains from pretest to posttest for the two experimental groups with large effect sizes: DCF ($r = .47$) and ME ($r = .54$). Moreover, there was a significant difference between pretest and delayed posttest in the ME group with a medium effect size ($r = .31$). Although learners in the ME group obtained slightly higher scores in the delayed posttests than form posttest, this difference did not reach significance.

Nonetheless, post hoc between group tests revealed that in the delayed posttest, the ME group performed better than the control group ($r = .28, p < .05$) whereas no significant differences were found between the DCF and control groups' delayed posttest scores. Additionally, these analyses revealed that in the posttest (but not in the delayed posttest), the DCF and ME groups outperformed the control group ($p < .01$) with large effect sizes ($r = .58$ and $r = .62$, respectively). In sum, both feedback types had significantly influenced learner's performances on the ECT, from which the ME treatment lead to better longitudinal gains after three weeks.

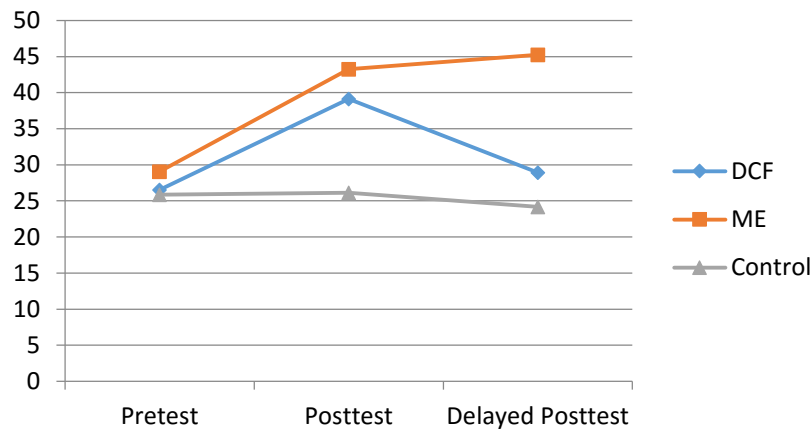


Figure 4. Mean percentage of the ECT

Discussion

The first research question addressed the effect of DCF on EFL learners' explicit and implicit knowledge of the English definite and indefinite articles. Results revealed that DCF led to better scores in the immediate posttests i.e., writing tasks, SDT, UGJT and ECT; while, this effect was not persistent in the long run. Moreover, the DCF group did not outperform the control group in the delayed posttests. Therefore, the findings of this study suggest that DCF had positive immediate effects on both implicit and explicit knowledge of English articles which could be not retained after 3 weeks.

This result generally agrees with those obtained in studies on article use (e.g., Bitchener, 2008, Bitchener & Knoch, 2010b; Ellis et al., 2008) that found positive effects of focused feedback on learners new and revised written productions. However, our finding with regard to the effect of DCF is not consistent with that of Shintani and Ellis (2013) and Shintani et al. (2014) who reported that DCF did not have any significant effect on the acquisition of indefinite article. One possible reason might be that these two studies only examined only the indefinite article while our study analyzed the combined scores for

definite and indefinite articles. A more plausible explanation would be that participants in the current study were all Iranian EFL learners whom were used to learning explicit grammar rules at schools; whereas, the two aforementioned studies used learners with mixed abilities in handling DCF.

In addition, the non-significant result with regard to the long-term effect of DCF in this study is contrary to other similar researches (e.g., Bitchener & Knoch, 2010b; Van Beuningen et al., 2012), which investigated the impact of a one treatment session and arrived at enduring outcomes. Again, there is a difference between these studies and the current research. As claimed by Bitchener and Knoch (2010b), due to the high scores in the pretest of their study, they were not sure about the long-term effects of CF. In addition, these two studies investigated advanced L2 writers whom might already had a good command of English articles.

The second research question asked whether ME focusing on English articles had any effects on learners' acquisition of explicit and implicit knowledge of the target structures. The findings revealed that ME learners' scores in all of the four instruments (writing tasks, SDT, UGJT, and ECT) improved from pretest to immediate posttest and then retained in the delayed posttest. That is, ME remained beneficial as time passed. Moreover, ME group noticeably outperformed the control group in the both immediate and delayed posttests in all of the four measures of implicit and explicit knowledge. Thus, ME proved to be effective in improving the implicit and explicit knowledge of English articles over time. This finding confirms the idea that "implicit knowledge once developed is not easily forgotten so if the ME had had an effect on the learners' genuine knowledge of language the effect should have been durable" (Shintani & Ellis, 2013, p. 300).

The results of the current study support previous research (e.g., Diab, 2015; Bitchener et al., 2005; Bitchener & Knoch, 2010b; Sheen, 2007) that suggest ME was effective immediately after it had been delivered and its effects did not wear off in the delayed tests. The pattern of the ME group scores in this study (pretest < immediate posttest ≤ delayed posttest) lend strong support to the argument, raised

by R. Ellis (1997) and N. Ellis (2005), that explicit knowledge can develop the processes which are involved in the development of implicit knowledge (e.g., noticing). Consequently, the awareness made as a result of ME in this study might cause the interaction between explicit and implicit knowledge of English definite and indefinite articles which is assumed to trigger L2 learning (Ellis, Loewen, & Erlam, 2006). Therefore, better scores in delayed tests after three weeks can suggest that ME encouraged changes in learners' implicit knowledge of English articles; that is, learners had successfully incorporated the target structures into their language system. This has also been underpinned by Ellis et al. (2006) and Mackey (1999).

Our findings with regard to ME partly run counters to Shintani and Ellis (2013) who found that ME led to the development of the learners' explicit knowledge but had no effect on their implicit knowledge. Moreover, Shintani and Ellis (2013) reported positive immediate effect for ME which was not retained in the delayed tests. In their study, the ME group was significantly better than the control group at Time 2 but not at Time 3, which was not the case in our study. The most likely reason could be related to the nature of the targeted structure in their study (i.e., indefinite article) which needs more time to be acquired than the definite article. Our results also contradicts that of Shintani et al. (2014) who reached no significant results with regard to the effect of DCF and ME on the acquisition of indefinite article. As suggested by the interviews in Shintani et al. (2014), this might be explained by the fact that learners focused their attention on the more complex target structure (i.e., hypothetical conditional) and did not focus on the indefinite article in their text reconstructions. It should be noted that, as far as the hypothetical conditional was concerned, Shintani et al. (2014) observed that both DCF and ME resulted in gains in explicit knowledge of this target structure but it atrophied over time which is similar to the findings obtained by Shintani and Ellis (2013) regarding the indefinite article.

The third research question investigated whether or not there was a differential effect for DCF and ME on learners' implicit and explicit knowledge of English articles. It was found that overall both

treatments were shown to be effective in the immediate posttests. However, the ME proved to have longer lasting effect than the DCF as the improvement of both knowledge types were sustained after a three week period in the ME group. Therefore, a point that can be made is that the description of the rules and the examples given explicitly in a ME handout may be more beneficial in promoting learners' implicit and explicit knowledge of English articles than the DCF.

Additional support for this result comes from Schmidt's (2001) idea regarding the role of awareness in L2 acquisition. Schmidt differentiates between *noticing* which is limited to conscious attention to a certain form in the input, and *understanding*, as a higher level of awareness, which entails knowledge of rules and metalinguistic awareness of that certain instance of language. Building on this notion, we can contend that the ME which was used in the current study promoted both levels of awareness; while, DCF elevated only *noticing* to the target structures. Schmidt argued that for the acquisition to take place, noticing is essential whereas understanding is very constructive. The support for this interpretation comes from the durable effects of ME in this study which is clear evidence for the potential of focused ME to help learners acquire implicit and explicit knowledge of English articles.

This view is confirmed by other studies (e.g., Bitchener et al., 2005; Ellis et al., 2006; Sheen, 2007, Shintani & Ellis, 2013) who found that ME was superior to other means of feedback when targeting certain linguistic structures. Results of the current research can make an important contribution to the debate on the role of ME. It demonstrates that the generic ME in the form of a handout can be more effective than the more time-consuming individualized DCF. This explanation would appear to be supported by Shintani and Ellis (2013) who used the same ME handout. However, still further research is desirable to examine the advantage of ME over DCF.

Conclusion

As discussed in the preceding section, the implementation of DCF in this study demonstrated to be beneficial on both implicit and explicit knowledge tests in the short term but the effects were not retained

after three weeks. On the contrary, ME led to the development of learners' implicit and explicit knowledge of English articles and its effects were durable as shown three weeks after the treatment. The benefit of ME handout used in this study is that it is not time consuming for the teacher since there is no need to correct each writer's text. However, it might not be the case for more complex target structures like the hypothetical conditional in Shintani et al. (2014). To the best of our knowledge only three studies (Shintani et al., 2014; Shintani and Ellis, 2013; 2015) have examined this type of ME whom provide inconclusive results. Thus, the operationalization of ME in the form of a handout warrants further investigation.

As mentioned earlier, Truscott (1996) reasoned that although DCF might contribute to learners' explicit knowledge it would not have any effects on their implicit knowledge. Similarly, other scholars (e.g., Bitchener, 2012; Polio, 2012) held the view that DCF is liable to develop L2 explicit rather than implicit knowledge. Our study lends credence to this claim as shown by the positive effects of DCF immediately after the treatment. However, judging from the empirical evidence for the long term effects of ME in the current study, it seems reasonable to conclude that ME is likely to develop both knowledge types, at least as far as the implicit and explicit knowledge of English definite and indefinite articles are concerned.

In language pedagogy, it is argued that corrective feedback is needed but it may lead to overcorrecting (Hedge, 2000). As practical implications, our study addressed this concern by targeting a single category. Results highlighted the potential advantages of focusing on one-error category as supported by previous research (e.g., Bitchener 2008; Bitchener and Knoch, 2009, 2010a; Ellis, 2009; Sheen 2007; Sheen, Wright, & Moldawa, 2009). Hence, language teachers are suggested to limit the focus of the feedback to one error at a time while they can switch to other structures during a course. Doing this, learners can concentrate on one identifiable structure effortlessly rather than dealing with a variety of linguistic errors at a time.

As with all such studies, there are limitations that offer opportunities for further research. First, the target structures in this

study were English definite and indefinite article. Thus, further research is necessary to find the role of targeting more complex structures. Second, all of the four tests used in this study were valid measures of implicit and explicit knowledge. However, due to logistic constraints, SDT was used instead of the oral elicited imitation task and Timed GJT. This demonstrates clear need for future research to make use of additional instruments in order to measure the implicit knowledge. Third, only three narrative writing tasks were completed in this study. Further research is required to explore the effects of feedback on more writing tasks over longer periods of time.

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