The Effect of Unfocused Direct and Indirect Written Corrective Feedback on the Implicit and Explicit Grammatical Knowledge and Writing Accuracy of EFL Learners

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ABSTRACT

This study investigated the effect of direct and indirect unfocused written corrective feedback (WCF) on the implicit and explicit grammatical knowledge as well as the writing grammatical accuracy of Iranian EFL learners in their new pieces of writing. To that end, 90 participants selected from a statistical pool of 380 EFL learners in seven private English language institutes were assigned into two treatment groups of unfocused direct and indirect WCF and one control group via random matching technique to receive the intended treatment. Five instruments, namely, Timed Grammaticality Judgment Test, Metalinguistic Knowledge Test, Untimed Grammaticality Judgment Test, Oral Imitation Test, and Writing Test were used to measure the probable learning gains in implicit/explicit grammatical knowledge and the writing accuracy of the participants due to the treatment. In turn, the statistical analyses of MANCOVA, MANOVA, and one-way ANOVA were used to analyze the data. Although no significant difference was identified between the two types of WCF in learning gains, the results showed that these two types of instructional treatment helped improve the explicit and implicit grammatical knowledge as well as the writing accuracy of the participants. Theoretical and pedagogical implications of the findings are discussed

Keywords: Direct/indirect unfocused WCF; Implicit/explicit grammatical knowledge; Writing accuracy; EFL learners.

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1. Introduction

One of the widely used educational activities in English classes is to provide corrective feedback (CF); many ESL/EFL practitioners consider it as a vital element which can contribute to learners' L2 development (e.g., Bitchener, 2012; Ellis, 2010; Manchón, 2011; Van Beuningen, 2010). Nonetheless, the role of written corrective feedback (WCF), as a mechanism to aid second language acquisition (SLA), is still unclear. Mainly, considering the fact that the majority of studies conducted on CF in an SLA framework have particularly focused on oral CF, the extent to which correcting written grammatical errors may assist students to notice their grammatical errors and whether it results in more grammatical accuracy in a new composition are still debatable (Sheen, 2007).

The initial point of the continuing educational and academic argument concerning the importance of WCF started with Truscott (1996) claiming that correcting grammar is unproductive and harmful, and ought to be discarded. As a response, Ferris (1999), pioneering the case for WCF, claimed that Truscott's arguments

were too debatable considering the quickly increasing studies establishing the value of WCF. Ferris (2007) maintains that learners should be given supplementary and attuned written correction by their instructors so that they can compensate for their grammatical limitations.

Meanwhile, although many studies have been conducted on the effectiveness of CF during the past two decades (e.g., Adams, 2003; Bruton, 2009; Manchón, 2011), several researchers have doubted the efficacy of WCF in second and foreign language classrooms and raised some major criticisms and problems concerning the effectiveness of WCF for grammatical development. Among them, we can enumerate (a) the lack of offering linguistic proof that students employ the knowledge learned from WCF on a former writing composition in a new piece of writing (e.g., Bitchener, 2012; Bruton, 2009) and (b) the absence of studies on WCF in the framework of SLA (Polio, 2012). In effect, despite an increasing evidence on the relationship between written error correction and written accuracy development over time (Bitchener &Ferris, 2012), many studies (e.g., Ashwell, 2000; Ferris & Roberts, 2001; Sheen, 2007) have until recently been restricted to investigating the impact of focused WCF in which one or two types of errors or some minor linguistic categories (e.g., English articles) are corrected as feedback. As Xu (2009) pointed out, providing L2 learners with focused WCF may cause them to deliberately notice using one or two grammatical categories as they are focusing on them, while ignoring others. Moreover, focused WCF has been criticized on the grounds that writing instruction and grammar correction are mainly intended to assist learners develop their overall writing accuracy, and not a very limited number of linguistic items (e.g., Ferris, 2010; Storch & Wigglesworth, 2010; Van Beuningen, Long & Kuiken, 2012).

In turn, considering an SLA viewpoint, the implicit/explicit issue is of paramount importance in the debate about the efficacy of error correction (Ellis, 2010). In effect, the type of knowledge acquired by L2 learners is a key issue in the debate on WCF and writing grammar correction. Those who challenge the importance of grammatical corrections (e.g., Krashen, 1982; Truscott, 1996) argue that all that is gained from grammar correction is explicit knowledge. Therefore, as it is only the implicit knowledge that enables students to spontaneously communicate, the explicit knowledge gained from instruction and grammar correction is seen less valuable in production. On the other hand, several other SLA researchers argue that there is an interface connecting implicit and explicit knowledge bases (e.g., DeKeyser, 2003; Hulstijn, 1995).

As to the effectiveness of WCF on the implicit and explicit knowledge, although there is currently sufficient empirical evidence (Ellis & Shintani, 2013) for oral CF indicating that this kind of CF leads to the development of implicit knowledge in oral free-production tasks (i.e., freely producing utterances including the target features), there is a dearth of research to date exploring whether WCF can help learners develop implicit knowledge, explicit knowledge or both (Polio, 2012). Investigating if WCF had any impact on adult L2 learners' explicit and implicit knowledge, Shintani and Ellis (2013) attempted to investigate the impact of one kind of CF (i.e., direct CF) compared with another kind of CF (i.e., providing metalinguistic explanation) on adult L2 learners' explicit and implicit knowledge. The findings showed that the metalinguistic explanation assisted the improvement of learners' L2 explicit knowledge, though the impact did not have durability and thus possibly was ineffective on their implicit knowledge.

In turn, while there has been a large amount of research on written error correction and its effects on writing accuracy, few studies have so far attempted to compare the effectiveness of unfocused direct vs. unfocused indirect WCF. As a rare example, Van Beuningen et al. (2012) attempted to compare the impact of direct and indirect unfocused WCF on the classroom composition of Dutch L2 students. The findings revealed that both indirect and direct unfocused WCF resulted in accuracy improvement in new pieces of writing when compared to the other two control groups (i.e., self-editing their writings without any CF). Similarly, little research has been conducted to investigate whether WCF helps the development of implicit and explicit grammatical knowledge or both (Polio, 2012).

Accordingly, this research was firstly intended to investigate the effect of different types of WCF on the implicit and explicit knowledge of different grammatical features. Secondly, it explored the impact of direct vs. indirect unfocused WCF (i.e., for the first kind of treatment the correct forms of the errors are provided and for the second kind of treatment the erroneous structures are just

underlined) on writing accuracy in learners' new pieces of writing over time. The following research questions were formulated to address the study objectives:

1. Does unfocused direct and indirect WCF affect the development of explicit and implicit knowledge of the English grammar of Iranian EFL learners?

2. Is there any difference in the probable effect of these two types of WCF on the development of implicit and explicit knowledge of the English grammar among Iranian EFL learners?

3. Do these two types of WCF lead to an increase in EFL writing accuracy compared to no feedback condition? If yes, which one?

2. Methodology

2.1. The study design

This study is based on a pre-test, post-test and delayed post-test design. The quantitative methods were utilized to collect data on the impact, if any, of direct and indirect unfocused written corrective feedback (WCF) on the implicit and explicit grammatical knowledge as well as the writing grammatical accuracy of Iranian EFL learners in their new pieces of writing.

2.2. Participants

To identify the participants for the current project, the researchers issued an announcement among seven private English language institutes in Behbahan city, Iran, and invited those EFL language learners studying in the 5th to 7th semesters according to the standards of American English File textbooks (Latham-Koeing, Oxenden, & Seligson, 2012) to take part in a non-compulsory writing module. 380 EFL volunteers were assured that the course was free of charge and they would receive bonus on their participation. To check their homogeneity, the participants were asked to sit for the Michigan Examination for the Certificate of Proficiency in English (ECPE) (Corrigan, Dobson, Kellman, Spaan & Tyma, 2010). Based on their performance on this test, 90 volunteers who scored one standard deviation below the mean score were identified as those needing special treatment.

The participants were assigned into three different groups each consisting of 30 learners via random matching technique. The study design composed of two treatment groups: the direct unfocused written corrective feedback (DUWCF) and the indirect unfocused written corrective feedback (IUWCF), and one control group. The DUWCF group received direct unfocused WCF on their writing tasks, while the second treatment group (i.e., IUWCF) was given indirect unfocused WCF on their writing tasks. The learners of the control group received no CF on their writing compositions in the 12 sessions; however, they were given general feedback on the quality and organization of their compositions.

2.3. Instrumentation

2.3.1. Michigan Examination for the Certificate of Proficiency in English (ECPE)

As for the homogeneity of the participants language proficiency level, ECPE (Corrigan et al., 2010) was employed which consisted of 50 listening items, 40 grammar items, 20 cloze items, 40 vocabulary items, and 20 reading comprehension each of which scored one point. The listening section was removed from the test battery due to the practicality problems and the research priorities. To ensure the reliability of the 120-itme test, it was piloted on 30 EFL learners other than the participants in the main study. The reliability coefficient was found to be 0.84. The scoring was estimated out of 120 items and the time allotted to take this test was 120 minutes. Based on the results of the proficiency test, those learners whose scores fell one standard deviation below the mean score were considered as the participants of the current study. In fact, their scores in the proficiency test showed that they were in need of more treatment on different language components, including grammar as it was targeted in the present study.

2.3.2. Oral Imitation Test (OIT)

This test adopted from Ellis (2006) measured implicit knowledge of the learners and consisted of 34 belief statements including both grammatical and ungrammatical sentences covering the 17 target structures, i.e., one grammatical and one ungrammatical sentence per structure. The test sentences were presented orally to participants on a CD player and they were expected to repeat the sentences orally in correct English as their responses were audio recorded. When a participant was not able to mimic a sentence, this was coded as 'avoidance'. In turn, each correctly imitated sentence was given a score of 1, while 0 score was allocated to each incorrectly imitated sentence.

2.3.3. Timed Grammaticality Judgment Test (TGJT)

The Timed Grammaticality Judgment Test (TGJT) adopted from Ellis (2006) contained 68 sentences (34 grammatical sentences and 34 ungrammatical sentences). The test offered four sentences for the judgment of each of the 17 grammatical structures. As Ellis (2006) pointed out, these 17 grammatical structures were selected based on several criteria: (a) they were shown to be generally problematic for EFL learners to produce and were acquired early or late in line with the developmental properties of L2 acquisition, (b) these structures represented a broad range of proficiency levels and consisted of both morphological and syntactical language features. The indication of the grammaticality or ungrammaticality of each sentence was required from the participants. The time limit was on average 6.24 seconds for each sentence. In Ellis (2006), this time was established by timing native speakers' performance on the sentences in a pilot study. After calculating the average of the native speakers´ performance, Ellis (2006) added 20 percent to the previous timing due to the slower processing speed of L2 learners. As far as the scoring mechanism was concerned, the TGJT items were scored dichotomously as either correct (1 point) or incorrect (0 point), with items left unanswered were scored as incorrect. The maximum score for this test was 68 points.

2.3.4. Untimed Grammaticality Judgment Test (UGJT)

In the Untimed Grammaticality Judgment Test (UGJT), participants had the same content as the timed one, while the difference was that they could use their own time to do it. The UGJT items were scored dichotomously as either correct (1 point) or incorrect (0 point), with items left unanswered scored as incorrect. The maximum score for this test was 68 points.

2.3.5. Metalinguistic Knowledge Test (MKT)

In the fourth test, the Metalinguistic Knowledge Test (MKT), adopted from Ellis (2006), the participants were presented with 17 ungrammatical sentences and were required to select the rule that best explained each error out of the four choices provided. The test takers were required to only mark the rule that best explained each error out of the four choices as the correct answer was scored 1.

2.3.6. Writing Test (WT)

A WT was utilized to measure the learners' writing accuracy in terms of the intended structures in the pre-test, post-test and delayed post-test sessions. In effect, we asked the learners to write descriptively about a suggested interesting real-life topics in about 100-150 words. As for measuring the writing accuracy in the WT, the percentage of error-free words was calculated. This is, the number of errors was counted in comparison to the entire number of words. According to Polio (1997), calculating the percentage of error-free words is a better representation for the quantity of errors than other accuracy measures including error-free t-units, in which there is no distinction between one and multiple errors per t-unit.

In order to account for the consistency of ratings for the WT, the basic measure for inter-rater reliability (IRR) which is a percent agreement between raters was used to calculate the IRR in the present study. That is, the number of ratings in agreement between the two raters (namely, one of

the researcher and another independent researcher in the field) was counted. The rating results showed that the raters agreed with each other about the ratings awarded on the writing accuracy of learners based on the number of errors to the total number of words in the WT (IRR=100%). In turn, repeated measurements by the same rater on the same day were used to calculate intra-rater reliability as a metric for rater's self-consistency in the scoring. The results showed that the intra-rater and the inter-rater reliability were equal.

It should be also noted that the above-mentioned tests measuring the implicit and explicit grammatical knowledge were already reliable and valid tests professionally designed by Ellis (2006). The Cronbach Alpha for the Oral Imitation Test had been reported as 0.88, for the Timed Grammaticality Judgment Test 0.96, for the Untimed Grammaticality Judgment Test 0.83, and for the Metalinguistic Knowledge Test, 0.79. To account for the construct validity of these four tests, Ellis (2006) ran a Principle Component Factor Analysis. This solution provided evidence for the claims that the Oral Imitation Test and the Timed Grammaticality Judgment Test were measures of the implicit grammatical knowledge while the Untimed Grammaticality Judgment Test and the Metalinguistic Knowledge Test were measures of the explicit grammatical knowledge. To ensure the reliability of these tests for the context of the present study, the researchers piloted the tests on 30 students other than the major participants of the study.

2.4. Procedure

First, the ECPE was used so as to homogenize the participants in terms of their levels of language proficiency. This test included 100 items and measured the general language proficiency of the test takers. Having scored the test, those learners whose scores fell one standard deviation below the mean score were selected as the participants of the current study to receive the intended treatment. In fact, their scores in the proficiency test showed that they were in need of more treatment on different language components, including grammar as it was targeted in the present study.

2.4.1 Treatment: Teaching and feedback procedure

As for the treatment, one of the researchers taught the two treatment groups and the control group in 12 sessions. To that end, learners were expected to write 12 descriptive compositions based on some suggested topics (e.g., describing a peaceful place that you have visited; describing a famous person that you would like to meet; describing an object that has been in your family for a long time; describing a memorable trip you took) throughout the 12-session treatment. Then, the first experimental group received DUWCF on their compositions, as the instructor identified the errors in their writing tasks while the focus was on the 17 grammatical items under investigation, and then provided learners with the correct forms of the errors. The compositions were then returned to the learners to reflect upon the WCF given on the relevant errors. In turn, the participants in the second experimental group received IUWCF on the relevant errors, as the instructor indicated that an error has occurred by underlying the erroneous structure but not providing the correct form of the error. Similarly, all the compositions were then given back to the learners in the second experimental group to reflect upon the WCF provided. On the other hand, the learners in the control group were given no specific WCF on the grammatical accuracy of their compositions in these 12 sessions. However, they received general feedback on the quality and organization of their compositions.

2.4.2 Test administration

Four testing instruments, namely, the UGJT and MKT together with TGJT and OIT were administered to measure the probable learning gains in terms of the explicit and implicit knowledge during the treatment sessions, respectively. In effect, the UGJT and MKT were used to measure the learners' explicit knowledge of the intended grammatical structures, while TGJT and OIT were to measure the learners' implicit knowledge of the structures. Besides, a WT was assigned to measure their writing accuracy in terms of the intended structures. To collect data on the implicit and explicit knowledge of learners, each of these tests was once administered as the pre-test, then post-test,

and finally delayed post-test. In turn, a WT was also assigned to measure the writing accuracy of the learners in terms of the intended structures for the pre-test, post-test and delayed post-test. The pre-tests including the UGJT, MKT, TGJT and OIT as well as the WT were assigned three days before the first treatment session, while the post-tests including the same tests were assigned a day after the last treatment session. As for the delayed post-tests, they were administered two weeks later so as to check the durability of the gains.

2.4.3 Target structures

In order to identify the grammatical problems of Iranian EFL learners in L2 writing, the researchers examined the related literature and came across several common writing grammatical errors identified by EFL instructors in their classes (e.g., Khansir & Shahhoseini, 2013; Boroomand & Rostami, 2013; Omidpour, 2014). To make sure if the suggested checklists were also generalizable to our target participants, 20 Iranian EFL instructors already teaching in those selected institutes were asked to rate the items and see if these items were also salient in their EFL classes. Among those items identified in previous studies, 30 items were commonly reported by those instructors surveyed to be as the most salient problems. Among these items, 17 grammatical structures were selected on the grounds that they were already reported by Ellis (2006) as the most universal grammatical errors made by English learners. Moreover, there were also some instruments professionally developed by Ellis (2006) to measure the implicit and explicit grammatical knowledge of these 17 structures for non-native learners of English. This, in turn, paved the way to measure the implicit and explicit grammatical knowledge of the same items for those learners taking part in the present study using reliable instruments already established.

3. Results

3.1. The results of reliability of the tests

To ensure the reliability of the tests for the context of the present study, the researchers piloted the tests on 30 students other than the major participants of the study. Then, the reliability of the different test measures was calculated using Cronbach Alpha. Table 1 displays the reliability coefficients for the measurement instruments.

Table 1. Tests' Reliability Analysis

Test	OIT	TGJT	UGJT	MKT	ECPE
Reliability	0.69	0.71	0.73	0.75	0.84

3.2. The descriptive statistics for the ECPE

In order to account for the homogeneity of the participants, ECPE was administered to 380 participants to determine their levels of language proficiency. After scoring the test papers, those learners who scored one standard deviation below the mean score were considered as the participants of the current study. The mean score, standard deviation, minimum and maximum scores of the 380 participants who took part in the MTELP are shown below in Table 2.

Table 2. Descriptive Statistics of the 380 Participants for ECPE

Test	N	Mean	SD	Min	Max
ECPE	380	60.80	10.2	27	98

The cut-off point of the ECPE scores was determined so as to assign the participants into three different groups (i.e., direct unfocused WCF, indirect unfocused WCF, and no feedback). The size of each class was 30 in order for the data to be generalizable. This way, 90 students who scored from

50.6 to 60.80 in the 120-item ECPE were assigned into three different groups via random matching technique to receive the intended treatments. The descriptive statistics of the 90 students who were selected as the participants and assigned into three groups based on their performance in ECPE are presented in Table 3.

Table 3. The Descriptive Statistics of the ECPE for the Three Groups of Learners

Test	Groups	N	Mean	SD	Min	Max
ECPE	DUWCF	30	54.6	3.3	51	59
	IUWCF	30	53.1	2.8	51	57
	CONTROL	30	53.8	2.9	51	58

3.3. The descriptive statistics of the tests

Table 4 below presents the mean scores and standard deviation for the learners' performance in the UGJT, MKT, OIT, TGJT and WT for the three testing occasions: pre-test, post-test, and delayed post-test. As Table 3.4 shows, in UGJT the gains for the two treatment groups were higher than that of the control group, but the first treatment group (namely; DUWCF) outperformed the second treatment and control groups (M= 53.00, SD= 3.4). The IUWCF group, in turn, showed more improvement than the participants in the control group (M= 52.53, SD= 3.6). In effect, despite the groups' pretest scores being approximately close to each other in all three groups, the posttest scores of the participants in the three groups differed from their pretest scores.

In MKT, the two treatment groups outperformed the control group, but the gains in the DUWCF group were higher than those in the second treatment and control groups (M= 15.37, SD= 1.1). The IUWCF group, in turn, showed more improvement than the participants in the control group (M= 15.00, SD= 0.98).

As shown in Table 3.4, the gains in OIT for the two treatment groups were more noticeable than those of the control group; however, the first treatment group outscored the second treatment and control groups (M= 30.37, SD= 1.9). The IUWCF group, in turn, outperformed the participants in the control group (M= 29.93, SD= 2.3).

In TGJT, all the three groups improved from the pre-test to the post-test; however, the participants receiving the DUWCF outperformed the other two groups (M= 54.53, SD= 3.4). The IUWCF group, in turn, showed more improvement than the participants in the control group (M= 54.03, SD= 3.2). In effect, despite the groups' pretest scores being approximately close to each other in all three groups, the posttest scores of the participants in the three groups differed from their pretest scores.

Similarly, as depicted in table 3.4 the two treatment groups outperformed the control group due to the treatment, but the first treatment group had more gains than the second treatment and control groups (M= 88.43, SD= 5.52). In turn, the IUWCF performed higher than the participants in the control group (M= 88.03, SD= 5.13).

Table 4. The Descriptive Statistics for the Tests in Three Testing Occasions

		Mean pre-test	SD	Mean Post-test	SD	Mean delayed post-test	SD
Control	UGJT	29.30	2.1	35.89	2.7	33.02	3.1
	MKT	9.53	0.54	11.01	1.3	10.8	0.95
	OIT	17.80	1.1	22.08	2.2	20.7	2.6
	TGJT	33.30	2.28	38.3	2.9	34.2	3.6
	WT	47.97	3.3	58.7	3.5	54.3	4.1
DUWCF	UGJT	29.40	1.8	53.00	3.4	52.40	3.28
	MKT	10.03	0.51	15.37	1.1	14.90	1.3
	OIT	17.70	1.2	30.37	1.9	29.83	2.1
	TGJT	33.47	2.3	54.53	3.4	53.83	3.4
	WT	48.17	3.2	88.43	5.52	87.33	4.37
IUWCF	UGJT	29.50	2.3	52.53	3.6	51.70	2.9
	MKT	9.80	0.53	15.00	0.98	14.67	1.4
	OIT	17.60	1.25	29.93	2.3	29.40	2.5
	TGJT	33.20	3.1	54.03	3.2	52.37	3
	WT	48.03	4.1	88.03	5.13	86.63	5.01

3.4. *Normality of the data*

To ensure the data is normally distributed, the Kemologov test (Smirnov) was used. If the test index is not significant, it shows that the distribution of variables is normal. The following table shows the normal distribution of the scores for the research variables.

Table 5. Descriptive Statistics for the Normality Test

Tests	Z test	P value
MKT	.858	.453
UGJT	.957	.246
TGJT	.920	.223
WT	.930	0.35
OIT	.870	0.41

As shown in the Table 5, none of the variables studied have statistical significance in the z test. Therefore, it can be said that the variables studied have a normal distribution.

At this juncture, the statistical analysis of MANCOVA was used to determine whether different types of WCF had different effects on the development of implicit and explicit grammatical knowledge as well as the writing accuracy of learners. Furthermore, MANCOVA was exploited to see if there were any significant differences between the three groups. In effect, to compare the control and treatment groups and tackle the first research question, on the basis of the post-test scores and controlling the effect of pre-tests, first a MANCOVA was performed on the data. The results of MANCOVA are shown in Table 6.

Table 6. The Results of Multivariate Tests for the Three Groups in the Dependent Variables (Tests)

Test	Value	F	Hypotesis df	Error df	Sig.
Pillai's Trace	0.998	15.737	10.000	158.000	0.0001
Wilks' Lambda	0.009	1.142	10.000	156.000	0.0001
Hotelling's Trace	108.526	835.651	10.000	154.000	0.0001
Roy's Largest Root	108.519	1.715	5.000	79.000	0.0001

As can be seen in Table 3.6, the results of MANCOVA on the control and treatment groups scores show that regarding the tests of Pillai's Trace, Wilks' Lambda, Hotelling's Trace and Roy's Largest Root, there is a significant difference, at least, in one of the dependent variables (F= 15.737, P< 0.0001). To find this difference, a one-way ANCOVA was performed on the investigated variables as shown in Table 7.

Table 7. The Results of One-Way ANCOVA on the Dependent Variables

Tests of Between-Subjects Effects							
Source	Dependent Variable	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Groups	UGJT	11148.661	2	5574.330	310.056	.0001	0.883
	UGJT Delayed	10258.12	2	4921.12	290.66	.0001	0.761
	MKT	584.082	2	292.041	271.523	.0001	0.869
	MKT Delayed	512.08	2	270.04	213.3	.0001	0.82
	OIT	3090.781	2	1545.390	422.421	.0001	0.912
	OIT Delayed	2892.61	2	1480.3	396.11	.0001	0.87
	TGJT	8638.262	2	4319.131	544.367	.0001	0.930
	TGJT Delayed	8214.28	2	4010.78	496.8	.0001	0.860
	WT	32105.957	2	16052.978	1173	.0001	0.966
	WT Delayed	31500.1	2	15900.89	1158	.0001	0.86

As shown in Table 7, a significant difference existed between the control group and the two treatment groups in UGJT (F= 310.506, P< 0.0001). There was also a significant difference between the control group and the two treatment groups in MKT (F= 271.523, P< 0.0001). In turn, a significant difference was found between the control and the two treatment groups in OIT (F= 432.421 and P< 0.0001). Therefore, to answer the first research question it should be said that the first kind of treatment (i.e., DUWCF) has had a positive impact on both the explicit grammatical knowledge (in both tests of UGJT and MKT) and the implicit grammatical knowledge (in both tests of OIT and TGJT) of Iranian EFL learners. The adjusted means of the dependent variables are presented in Table 8 after adjusting the pre-test scores.

Table 8. The Adjusted Means of the Dependent Variables

Dependent Variable	Groups	Delayed post-test Means	Delayed post-test Standard Deviation	Post-test Means	Std. Error	95% Confidence Interval Lower Bound	Upper Bound
UGJT	Control	33.8	2.1	35	.778	30.438	35.535
	DUWCF	53.1	3	53.08	.778	51.540	54.637
	IUWCF	51.8	2.56	52.49	.774	50.951	54.032
MKT	Control	10	0.8	10.9	.190	10.302	11.059
	DUWCF	14.2	1.1	15.25	.190	14.876	15.634
	IUWCF	14	1	14.99	.189	14.621	15.374
OIT	Control	20	2.1	21.63	.351	18.935	22.332
	DUWCF	28.8	1.8	30.347[a]	.351	29.648	31.045
	IUWCF	28.5	2.1	29.986[a]	.349	29.291	30.681
TGJT	Control	32.8	2.9	37.9[a]	.517	34.302	39.359
	DUWCF	51.2	3	54.399[a]	.517	53.370	55.427
	IUWCF	50.3	2.1	54.171[a]	.514	53.148	55.195
WT	Control	54	4	58.2[a]	.679	54.450	59.152
	DUWCF	87	4.7	88.367[a]	.679	87.016	89.718
	IUWCF	85	3.8	88.032[a]	.676	86.688	89.376

a. Covariates appearing in the model are evaluated at the following values: UGJT = 29.40, MKT = 9.79, OIT = 17.70, TGJT = 33.32, WT = 48.06.

In Table 8, after adjusting the pre-test scores, a significant difference was found between the two treatment groups and the control group. The adjusted mean scores indicated that the two treatments of DUWCF and IUWCF increased the explicit and implicit grammatical knowledge of the Iranian EFL learners.

To answer the second research question, a MANOVA was performed. Table 9 shows the results of the MANOVA.

Table 9. The results of Multivariate Analysis of Variance (MANOVA)

Multivariate Tests[b]							
Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.997	4.947E3[a]	4.000	55.000	.000	.997
	Wilks' Lambda	.003	4.947E3[a]	4.000	55.000	.000	.997
	Hotelling's Trace	359.800	4.947E3[a]	4.000	55.000	.000	.997
	Roy's Largest Root	359.800	4.947E3[a]	4.000	55.000	.000	.997
GA1	Pillai's Trace	.041	.587[a]	4.000	55.000	.673	.041
	Wilks' Lambda	.959	.587[a]	4.000	55.000	.673	.041
	Hotelling's Trace	.043	.587[a]	4.000	55.000	.673	.041
	Roy's Largest Root	.043	.587[a]	4.000	55.000	.673	.041

a. Exact statistic
b. Design: Intercept + GA1

Table 9 shows the results of the MANOVA for the two treatment groups. Considering the tests of Pillai's Trace, Wilks' Lambda, Hotelling's Trace and Roy's Largest Root, no significant difference existed in the dependent variables (P> 0.05 and F = 0.587). Therefore, it can be said that there was no significant difference between the impacts of the two treatments (DUWCF and IUWCF) on the improvement of the explicit and implicit grammatical knowledge in the three testing occasions of the pre-test, post-test, and delayed post-test.

As for the third research question, the results of MANCOVA in the control and treatment groups revealed that considering the tests of Pillai's Trace, Wilks' Lambda, Hotelling's Trace and Roy's Largest Root, there was a significant difference (*F*= 15.737 and *p*< 0.0001) at least for one of the dependent variables (see Table 6). To find about this difference, a one-way ANCOVA was performed on the investigated variables. The relevant findings are shown in Table 7.

As shown in Table 7, a significant difference (F= 117.33, P< 0.0001) existed between the control group and the treatment groups in terms of WT. Therefore, it can be said that by eliminating the pre-test effect, DUWCF and IUWCF increased the writing accuracy of the participants in the two

treatment groups compared to that of the control group. After adjusting the pre-test scores, the adjusted mean scores of the WT are shown in Table 8.

As can be seen in Table 8, after adjusting the pre-test scores, there was a significant difference between the two treatment groups and the control group. The adjusted mean scores suggest that the two treatments (DUWCF and IUWCF) led to the improvement in the writing accuracy of the Iranian EFL learners.

In addition, a one-way ANOVA was performed on the WT to investigate the possible difference between the mean scores of this dependent variable in DUWCF and IUWCF groups, in post and delayed posttests. The results of the one-way ANOVA are presented in Table 10.

Table 10. The Results of the One-Way ANOVA

Tests of Between-Subjects Effects					
Dependent Variable: WT					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	56.625ᵃ	3	18.875	.693	.558
Intercept	921026.408	1	921026.408	3.383E4	.000
GA1	56.625	3	18.875	.693	.558
Error	3157.967	116	27.224		
Total	924241.000	120			
Corrected Total	3214.592	119			
a. R Squared = .018 (Adjusted R Squared = -.008)					

As shown in Table 10, the results of one-way ANOVA for the treatment and control groups revealed no significant difference between the two treatment groups (p <0.05) regarding their post-test scores and the delayed post-test scores in the WT. Convincingly enough, a Tukey's test followed to make multiple comparisons between the different groups so as to determine which group did better on the WT. The results are presented in Table 11 below.

Table 11. The Multiple Comparisons between the Groups in the Tukey's Test in Terms of Writing Accuracy in WT

Multiple Comparisons							
Tukey HSD							
						95% Confidence Interval	
Dependent Variable	(I) g	(J) g	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Control	Control	DUWCF	-7.20000*	.95336	.000	-9.5638	-4.8362
		IUWCF	-5.00000*	.95336	.000	-7.3638	-2.6362
	DUWCF	Control	7.20000*	.95336	.000	4.8362	9.5638
		IUWCF	2.20000	.95336	.072	-.1638	4.5638
	IUWCF	Control	5.00000*	.95336	.000	2.6362	7.3638
		DUWCF	-2.20000	.95336	.072	-4.5638	.1638
*. The mean difference is significant at the 0.05 level.							

As it is shown in Table 11, significant differences were identified between the mean scores of the control group and those of the DUWCF group (p<0.05, Mean Difference = 7.20000). When compared, the mean score of the control group also differed significantly from that of IUWCF group (p<0.05, Mean Difference = 5.00000). However, no significant differences were located between the mean score of the DUWCF group relative to that of IUWCF group (p<0.05, Mean Difference = 2.20000). Thus, it was reasonably decided that significant differences existed between the two treatment groups in terms of their writing accuracy compared to the control group, as they enjoyed higher degrees of significance of their mean scores and standard deviation as compared to that of the control group, while the two treatment groups were not significantly different in terms of the learners' writing accuracy.

4. Discussion

The main objective of the current research project was to investigate the effect of direct and

indirect unfocused WCF on the implicit and explicit grammatical knowledge of EFL Iranian learners. The second aim was to explore the effectiveness of direct and indirect unfocused WCF on reducing errors of learners in a new piece of writing over time. To that end, 90 EFL language learners took part in a non-compulsory writing module instructed by one of the researchers. The collected data from the participants' answers to the tests as well as the data from assessing their performance in the writing test were accordingly analyzed inferentially.

To answer the first research question targeting the effects of unfocused direct and indirect WCF on the development of the explicit and implicit knowledge of the English grammatical knowledge of Iranian EFL learners, the TGJT, UGJT, MKT, and OIT were run to measure the explicit and implicit grammatical knowledge of the participants. The results of MANCOVA and the accompanied one-way ANCOVA suggested that both direct unfocused WCF and indirect unfocused WCF were effective in promoting both the implicit and explicit grammatical knowledge of the participants. However, these findings are in contrast with those of Polio's (2012), indicating that WCF contributes to explicit rather than implicit grammatical knowledge. Polio (2012) pointed out that WCF may assist only the development of the explicit knowledge. Similarly, Bitchener (2012) argued that the findings of the studies investigating WCF support the claim that it is likely for students to internalize their explicit grammatical knowledge through WCF and later it is possible that WCF contributes at least to the development of explicit grammatical knowledge.

Besides, the findings of the present study are not in line with other studies (e.g., Ferris, 1999, 2007; Polio, 2012; Williams, 2012) indicating that WCF contributes to the development of only the explicit grammatical knowledge. The present study reveals that different types of WCF (at least direct unfocused WCF and indirect unfocused WCF) can contribute to the development of both the explicit and implicit grammatical knowledge of the language learners.

In effect, in line with many SLA researchers (e.g., DeKeyser, 2003; Hulstijn, 1995), our findings converge on the position that there is an interface connecting implicit and explicit knowledge bases. Drawing on Skill Acquisition Theory, we also believe that the gap between explicit knowledge and language use can be gradually bridged by output practice (DeKeyser, 2003). By practicing language production, L2 learners are, indeed, enabled to consolidate and automatize their linguistic repertoire (Manchón, 2011). Moreover, WCF is believed to further assist the proceduralization of declarative L2 knowledge (Ellis, 2010). In effect, the results of the present study conform to the interface position (DeKeyser, 2003; Hulstijn, 1995), suggesting that output practice (e.g. writing practice) can automatize the linguistic repertoire of language learners; thereby they can make use of both the implicit and explicit grammatical knowledge in the process of writing composition.

To answer the second research question targeting the probable difference in the effect of these two types of WCF on the development of the implicit and explicit knowledge of the English grammar among Iranian EFL learners, a MANOVA was performed. The results showed no significant difference between the impacts of the two treatments (DUWCF and IUWCF) on the improvement of the explicit and implicit grammatical knowledge in the three testing occasions of pre-test, post-test, and delayed post-test. In fact, our findings contradict the findings of Shintani and Ellis (2013) who investigated the effects of one kind of CF (direct CF) with another kind of CF (providing metalinguistic explanation) on adult L2 students' explicit and implicit knowledge. In contrast to our findings, it was shown that the direct CF had no impact on the accurate use of the target form, signifying that it was not beneficial for either the explicit or implicit grammatical knowledge. However, the provision of metalinguistic explanation resulted in gains in accuracy in the error correction test and in a new piece of writing following the treatment in the immediate post-test but not in a second piece of writing which was done two weeks later as the delayed post-test. These findings are construed as suggesting that the metalinguistic explanation assisted the development of students' L2 explicit knowledge, though the impact did not have durability and thus possibly was not effective for their implicit knowledge.

As an alternative perspective, several scholars adhere to an intermediate position (e.g., Doughty & Williams, 1998; Ellis, 2006). They see implicit and explicit knowledge as being separated, but argue that explicit knowledge may feed into the intake process by helping learners notice the formal features of the input. From this perspective, CF could be expected to foster interlanguage

development because it facilitates the process of noticing (the gap). In turn, the results of the present study can be construed as being in line with the intermediate position (e.g., Doughty & Williams, 1998; Ellis, 2006) as, in the present study, the two types of WCF employed contributed almost equally to the development of both the explicit and implicit of grammatical knowledge and it can also be construed that the participants of the present study made use of these two types of knowledge while writing.

Regarding the third research question investigating whether the two types of WCF employed in the present study led to an increase in the accuracy development of learner writing compared to no feedback group, the results of conducting the writing test, which was a measure of writing accuracy of the students in terms of the intended structures, showed a significant difference between the two treatment groups and the control in the post-test and delayed post-test scores. However, the results of MANCOVA accompanied by one-way ANCOVA revealed that the difference between direct unfocused WCF and the indirect unfocused WCF was not statistically significant in the post-test and delayed post-test scores, though the participants receiving direct unfocused WCF slightly outperformed the other treatment group. Furthermore, the direct unfocused WCF had a more enduring effect on the writing accuracy development of the learners; though, it was found that those who received different types of WCF lost some gains at the time of the delayed post-test.

Regarding these findings, it can be construed that providing the learners with written error correction, regardless of the kind of written feedback approach, was effective in decreasing the quantity of written errors on the grammatical forms and structures targeted in this study. Although there were not any major differences among the two kinds of WCF employed in this study, providing any kind of written error correction was more effective than supplying no error feedback at all in developing learners' writing accuracy in a new piece of composition. These findings appear to be consistent with what WCF supporters (e.g., Bitchener & Knoch, 2010a; Ellis et al, 2008; Sheen, 2007) claim that repeated written error feedback and practice result in better writing accuracy in new pieces of writing, whereas no WCF caused the participants of the control group not to notice their written errors in the process of their writing, which, in turn, hindered their writing accuracy improvement over time. Moreover, consistent with our findings, Bitchener and Knoch (2009) offered evidence indicating that all types of written error correction are likely to be more effective than no CF on students' writing grammatical accuracy.

In addition, a one-way ANOVA was performed on the WT to investigate the possible difference between the mean scores of this dependent variable in DUWCF and IUWCF groups, and also in the post-test. Our findings showed no significant difference between the two treatment groups regarding their post-test scores and delayed post-test scores in the WT. The findings of the current study, in turn, are not congruent with those of Ferris's study (2007) which showed that indirect written feedback was more effective for writing accuracy improvement than direct written feedback. He indicated that students will benefit noticeably from indirect written error feedback because it encourages a more profound internal processing and as a result, it is more likely to contribute to long-term retention. As the findings of the present study reveal, both direct and indirect unfocused WCF contributed to the writing accuracy development of the language learners. Although, the direct group outperformed the indirect group, the difference was not statistically significant. Similarly, the findings of the current study are not in line with Ellis' (2009) claim that the direct kind of WCF does not trigger long-term learning. In fact, these results reveal that direct WCF does promote the improvement of students' writing. In contrast, the findings of the present study are in line with the results of the previous studies by Bitchener and Knoch (2010b), Chandler (2003), Ferris and Hedgcock (2005), Ferris and Roberts (2001) indicating that there is a lack of sufficient evidence to suggest that direct unfocused WCF is significantly more effective than indirect unfocused WCF.

5. Concluding remarks

Given the ongoing skepticism by Truscott (1996) regarding the significance of WCF, that criticism is grounded mainly in what he considers as a lack of empirical support indicating that written

error correction develops acquisition as illustrated by improvements in grammatical accuracy in a new piece of writing. Nevertheless, it is assumed that such evidence is currently becoming accessible. The present study reveals that WCF can be beneficial in developing higher grammatical accuracy development in a new piece of writing as well as the development of implicit and explicit grammatical knowledge. Importantly, our results indicate that written error correction can be effective in an EFL context as well as an in an ESL context.

The findings of this study can be supposed to have contributed to the field of SLA by providing empirical evidence to the general question of whether different types of WCF facilitated language learning by comparing the extent to which both types of WCF led to the improvement of implicit and explicit grammatical knowledge and also the writing accuracy of the EFL learners over time. In effect, this study showed that WCF can be effective in promoting the implicit and explicit grammatical knowledge and enhancing greater grammatical accuracy, more importantly, in a new piece of writing.

The findings of the current study are also beneficial for L2 instructors as they reveal that, with the provision of the direct and indirect written error feedback, teachers are supposed to further promote the students' mastery of linguistic forms that continue to emerge as linguistic errors in their writing compositions. Furthermore, as this study showed, teachers should be assured that the provision of written error feedback on a number of grammatical forms and structures is more likely to be effective and assists language learners to develop their general writing accuracy than the provision of no feedback on written errors from different grammatical forms in students' new pieces of writing.

To conclude, the current research project, in turn, is not without its limitations. This research was carried out with language learners who were in their 5th to 7th semesters in some private language institutes. Therefore, further studies are needed to explore the effects of different kinds of written error correction with university students at higher levels of proficiency and to investigate whether the proficiency level of students can affect the results. Furthermore, the present study did not scrutinize other variables such as gender differences of the participants because of the feasibility limitations. Different personality traits are deemed to have differential impacts on the success of written error correction (Sheen, 2007). Finally, more research would be required to explore the question of the extent to which the observed writing accuracy is due to the possibility of complex structures avoidance by the learners.

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