

**The effects of direct and indirect written corrective feedback (CF) on English-as-a-second-
language (ESL) students' revision accuracy and writing skills**

By

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of the Requirements for the Degree of
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University of Victoria

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Supervisory Committee

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Abstract

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Since the publication of Truscott's paper in 1996 arguing against the effectiveness of grammar correction in second language (L2) writing, there has been an ongoing debate regarding the effectiveness of written corrective feedback (WCF) in the field of second language acquisition (SLA). This debate has continued due to conflicting research results from research examining short-term effects of WCF and scarcity of research investigating its long-term effects (Ferris, 2004, 2006). Using a mixed-method research design, this study investigated the effects of direct and indirect WCF on students' revision accuracy of the same piece of writing as well as its transfer effects on new pieces of writing over time. The present study also investigated the differential effects of direct and indirect CF on grammatical and non-grammatical errors. Using a stimulated recall strategy, the study further explored students' perception and attitude regarding the types of feedback they received. Fifty-three intermediate level English-as-a-second-language (ESL) students were divided randomly into four groups: direct, underlining only, Underlining+meta-linguistic, and a control group. Students produced three pieces of writings from three different picture prompts and revised those over a three-week period. To examine the delayed effects of feedback on students' writing skills, each group was also asked to produce a new piece of writing two weeks later.

The results demonstrated that all three feedback groups significantly outperformed the control group with respect to revision accuracy in all three writing tasks. WCF did not have any significant delayed transfer effects on improving students' writing skills. Short-term transfer effects on overall accuracy, however, were found for Underlining+metalinguistic CF, but not for other feedback types. In terms of grammatical and non-grammatical accuracy, only Direct CF displayed significant short-term transfer effects on improving grammatical accuracy. These findings suggest that while Direct CF was successful in improving short-term grammatical accuracy, both direct and indirect CF has the potential to improve accuracy in writing. The findings also clarify that no single form of CF can be effective in addressing all types of linguistic errors.

Findings from the qualitative study demonstrated that different aspects of direct and indirect CF helped learners in different ways to successfully attend to different types of CF. In the case of Direct CF, learners who successfully corrected errors believed that the explicit information or correction was useful for them. They believed that it helped them understand what errors they made and helped them remember the corrections. Learners who were successful in correcting errors from indirect CF in the form of underlining and in the form of underline in combination with metalinguistic CF indicated that these two types of indirect CF helped them notice the errors, think about the errors, guess the correct form(s) or feature(s) and also remember the correction. The findings also indicated that both grammatical and non-grammatical errors could be difficult for learners to correct from indirect CF if they do not have sufficient L2 proficiency. Findings from the qualitative study also indicated that while learners considered both direct and the two indirect CF as useful, indirect CF in the form of underlining together

with metalinguistic CF was preferred by a majority of learners as it provided valuable information about the errors made as well as promoting thinking and better understanding.

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Dedications

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CHAPTER ONE – INTRODUCTION

1.1 Background and Purpose of the Study

Corrective feedback (henceforth CF) is a central aspect of second language (L2) writing programs around the world, but it has been a controversial topic in English-as-a-second-language (ESL) teaching. Since the publication of Truscott's paper in 1996 arguing against the effectiveness of grammar correction in L2 writing, there has been an ongoing debate on this topic. Truscott (1996) claimed that CF is not only ineffective, but it also has a potentially harmful effect on L2 students' writing. He expressed his concern regarding teachers' ability to provide sufficient and consistent feedback and learners' ability and willingness to use the feedback effectively. The harmful effect, as pointed out by him, is that by emphasizing learner errors through CF, teachers run the risk of making their students avoid more complex structures. Truscott (1996, 2004) further suggested that CF is a waste of time and teachers and learners should allocate their time and energy on additional writing practice (Van Beuningen et al., 2012).

Many researchers, since 1996, have investigated the effectiveness of feedback and defended the use of corrective feedback. Ferris (1999), for example, wrote a response to Truscott's paper and provided evidence in support of error correction in L2 writing. According to Ferris (2004), "despite the published debate and several decades of research activity in this area, we are virtually at Square One, as the existing research base is incomplete and inconsistent, and it would certainly be premature to formulate any conclusions about this topic" (p. 49). Since then, a number of L2 writing studies investigated the effectiveness of CF in L2 writing. Most of the early studies that

investigated the effect of CF on accuracy had conflicting results regarding the effectiveness of error feedback. While some of these studies concluded that grammatical error correction is effective, others found grammatical error correction to be ineffective. The research literature has not been clearly positive about its role in writing development (Hyland and Hyland, 2006). Ferris (2004) and Guenette (2007) pointed out that this lack of conclusive results in support of corrective feedback or one type of corrective feedback is due to poor research design and lack of comparability between these studies. Several recent studies have tried to find a more conclusive answer to the question of the effectiveness of CF by addressing some of the research design flaws of the early studies through incorporating control groups and measuring improvement of accuracy in new pieces of writing (Storch, 2010). But findings about the effectiveness of direct and indirect feedback from these recent studies are still inconclusive. Furthermore, these studies have focused their investigation on finding the effectiveness of direct feedback only, and have also used 'one-shot' designs, where feedback was provided only on one occasion and on a single text. Also, only one recent study has investigated learners' perspective on feedback (e.g., Storch and Wigglesworth, 2010). Therefore, more research needs to be conducted addressing the effectiveness of different types of feedback and taking into account learners' perspectives on feedback for our better understanding of the effectiveness of CF.

Accordingly, the first aim of the current research project is to investigate the effectiveness of different types of CF in L2 writing. In particular, the aim was to investigate the effect of direct and indirect comprehensive feedback (i.e., providing feedback on all errors) on reducing errors in student revisions of the same essay and in a

new piece of writing over time. The second aim was to account for the learners' perspective of different types of feedback and their effectiveness on both grammatical and non-grammatical errors. In particular, for this part, the study investigated learners' perception and attitude regarding the types of feedback they received and also their motivation behind the correction (and not correction) of the identified errors.

1.2 Significance of the Study

Addressing the methodological limitations of the previous studies, this research project provided treatment (target feedback) on more than one occasion (3 times). The participants produced three new narratives in three weeks, revised those after receiving CF treatments, and also produced a new piece of narrative two weeks after they last received the CF treatment. Thus, not only short-term but also long-term effectiveness of corrective feedback was identified. The qualitative component to investigate learners' perspective on the feedback they receive would help to explore how learners actually use and utilize CF, which could provide insights on how and when learners benefit from error correction. Furthermore, as this research project investigated the effectiveness of direct and indirect feedback on reducing 'grammatical' and 'non-grammatical' errors, it would help to find out whether or not the effectiveness of direct and indirect feedback depends on the type of error that is targeted.

In general, the findings of this research study will be a huge contribution to the ongoing debate between Truscott (1996, 2001, 2004 and 2007) and Ferris (1999, 2002, 2004 and 2010) regarding the effectiveness of CF on L2 acquisition. This research will advance our knowledge in the field of applied linguistics, particularly second language

writing. Applicability of the findings from this investigation will be extended to both theoretical and pedagogical contexts. As the success of ESL learners at all levels depends on their proficiency in L2 writing, the findings will provide invaluable information to L2 scholars and teachers about the role of feedback in developing learners as successful writers. Any compelling evidence regarding error categories and the effect of feedback in reducing those errors will help refine and improve the current practice of teaching ESL writing. L2 writing syllabuses will also be able to incorporate empirically substantiated methods and tasks. Furthermore, the findings will also enable ESL teacher training institutions to equip prospective ESL teachers with necessary strategies to provide feedback that will facilitate L2 writing development.

1.3 Outline of the Dissertation

This dissertation consists of six chapters. The first chapter provides the background, purpose, and significance of the present study. Chapter two first defines feedback and error correction. Then, the chapter presents discussions on the role of CF in second language acquisition (SLA) and in L2 writing, compares differing views on the role of CF in L2 writing, and then presents the review of early and recent literature on the effectiveness of written CF in L2 writing. Chapter two concludes with a discussion of the rationale for the current study and the presentation of the research questions. Chapter three presents the research methodology used in the present research study. This chapter first narrates the research design and then describes the participants, the treatment groups, the procedure including the instruments used, the pilot study, data processing and data collection timeline. Chapters four and five report data analysis as well as present the

findings for the research questions discussed in Chapter two. Chapter four first describes the assessment measures, then introduces the data analysis, and finally presents the findings derived from the statistical analysis with regards to the effects of CF on revision accuracy and writing skills. Chapter five explores learners' perceptions and attitude towards CF and presents the findings from the qualitative analysis. Chapter six presents the discussion and conclusions, and also the theoretical and pedagogical implications of the findings. This chapter ends with a discussion on the limitations of the present research and provides directions for further research.

CHAPTER TWO – REVIEW OF THE LITERATURE

This chapter begins with the presentation of the definitions of CF and a typology of different written CF types. The second section discusses the differing views of CF in SLA theories and in L2 writing research. The third section discusses the differing views on the role of CF in L2 writing development. The next section presents a review of the literature, which includes early and recent research that claimed to have found evidence for and against CF. The final section introduces the statement of purpose and the research questions for the current study.

2.1 Defining Feedback and Error Correction

Various terms have been used in identifying errors and providing feedback in the SLA literature. Some of the most frequently used terms are: ‘corrective feedback’, ‘negative evidence’, ‘negative feedback’, ‘treatment’ and ‘repair’. Several SLA researchers/authors have defined or described corrective feedback differently. According to Chaudron (1998), as asserted by Tatawy (2002), the term ‘corrective feedback’ is used in a variety of ways. Tatawy (2002) elaborated that in Chaudron’s view, the term ‘treatment of error’ refers to teachers’ reaction to an error which tries to inform the learner about the fact of error. This treatment may not be observed by the student, or some treatment may be made very explicit to elicit a revised response from the student. Tatawy (2002) further pointed out that in Chaudron’s view, the effective correction helps learners to modify their interlanguage rule in a way that the error does not occur again.

In Schachter's (1991) opinion, the term 'corrective feedback', 'negative evidence', and 'negative feedback' are three terms with similar meaning, used respectively in the field of language teaching, language acquisition and cognitive psychology. Schachter adds that the phenomena that can be interpreted as negative data/evidence include: "confirmation checks, clarification requests, failure to understand (such as Huh? Or What?), silence, expanded and corrected repetitions", and even laughter (p. 90). Lightbown and Spada (1999) defined CF as "an indication to the learners that his or her use of the target language is incorrect" (p. 172). CF, in their view, can include a wide variety of responses, ranging from implicit to explicit, and some may also contain additional metalinguistic information. According to Li (2010), "corrective feedback in SLA refers to the responses to a learner's nontargetlike L2 production" (p. 309).

Long (1996) further elaborated the view of CF. According to him, the input language learners receive can be categorized 'positive evidence' and 'negative evidence'. Positive evidence, as Long pointed out, is providing the learners with examples of what is grammatical and acceptable in the TL. Negative evidence, on the other hand, is providing information explicitly or implicitly to the learners about what is "ungrammatical" (p. 413). Gass and Selinker (2001), however, defined positive evidence as: "that language (in both spoken and written forms) to which learner is exposed" (p. 260) and negative evidence as: "information provided to the learner concerning the correctness of form" (p. 457).

There are also some apparent differences between oral and written CF. As pointed out by Sheen (2010), oral CF takes place immediately after the occurrence of an error, while, on the other hand, written CF is delayed. Sheen also asserted that written CF is

cognitively less demanding than oral CF, which requires learners to provide an immediate response. While accuracy of the erroneous utterances is the primary focus in oral feedback, written feedback intends to improve the overall quality of students' writing, focusing on content and organization. Referring to Polio (2001), Sheen further elaborated that written CF can be more complex than oral CF as it takes into account many aspects of writing, for example, "overall quality, grammatical accuracy, syntactic complexity, lexical features, content, mechanics, coherence and discourse features, and fluency" (p. 176).

The next subsection discusses different types of written feedback available to teachers and researchers. There are a number of studies that have investigated the efficacy of different types of written CF. Written CF research has compared different types of written feedback in order to find out if one type of feedback is more effective than others. Understanding the nature of each type of feedback might help researchers to investigate the relative effectiveness of different types of feedback with more accurate and efficient research designs. Likewise, such understanding would enable teachers to provide feedback to their students effectively and as per students' needs. As this paper will review research that investigated the efficacy of different types of written CF, understanding the nature and characteristics of each type of feedback is vital to critical examination of this research.

2.1.1 Typology of written corrective feedback types

Identifying the options for correcting students' linguistic errors in a systematic way is important for determining if written CF is effective and, if it is, what kind of CF is

most effective (Ellis, 2009). Ellis presented a typology of different types of written CF available to teachers and researchers “as a basis for the systematic approach to investigating the effects of written corrective feedback” (p. 97). Based on teachers’ handbooks and published empirical research, Ellis listed 6 types of feedback to correct linguistic errors in students’ written work. The types of feedback and their descriptions are as follows:

- i) Direct CF (The correct form is provided to the students by the teacher.)
- ii) Indirect CF (The teacher indicates that an error has occurred but does not provide the correction.)
- iii) Metalinguistic CF (The teacher provides some kind of metalinguistic clue regarding the nature of the error. These can be in the forms of use of error code written in margin or brief grammatical descriptions for each numbered error at the bottom of the text.)
- iv) Focused and unfocused CF (Focused CF is intensive, i.e., correction on specific type(s) of error; and unfocused CF is extensive, i.e., correction on all or most errors.)
- v) Electronic feedback (‘The teacher indicates an error and provides a hyperlink to concordance file that provides examples of correct usage’.)
- vi) Reformulation (Native speaker’s reworking of the entire text of the students ‘to make the language seem as native-like as possible while keeping the content of the original text’.) (Ellis, 2009; p. 98).

The next section elaborates on differing views regarding the importance and role of error correction in SLA and L2 writing theories and the apparent difference in the nature of SLA and written CF research.

2.2 Corrective Feedback (CF) in SLA and L2 Writing

The role and treatment of errors or CF has been viewed differently within different theories of SLA. These differing views also have had an impact on the research on corrective feedback in SLA and L2 writing. The following subsection 2.2.1 elaborates the differing views of errors in SLA theories, and subsection 2.2.2 describes how the role of error correction has been addressed differently in SLA and L2 writing research.

2.2.1 Error in SLA theories

Theories of first language (L1) acquisition and L2 acquisition have had different views regarding the importance of error correction, also known as CF. According to the behaviourist view (e.g., Lado, 1957), errors are considered harmful to learning and thus require immediate treatment or correction. According to the nativist view, acquisition is considered to be driven by positive evidence, and CF plays very little or no role at all in acquisition. Chomsky (1975), for example, argued that negative evidence¹ (correction of form) does not have any effect on L1 acquisition. Some of the advocates (e.g., Carroll, 1995; Cook, 1991) of Chomsky's theory of Universal Grammar (UG) - "the system of principles, conditions, and rules that are elements of properties of all human languages" (Chomsky, 1976; p. 29)- argue that negative evidence affects language behaviour only, but not learners' interlanguage (IL) grammars. According to Krashen (1982, 1985), L2 acquisition is a subconscious process and it cannot be altered by negative evidence. He believes that L2 learners need positive evidence for second language acquisition, which he termed as "Comprehensible Input". And according to the interactionist view, errors are

¹ Definitions of 'positive evidence' and 'negative evidence' have been provided in section 2.

considered treatable through naturally occurring feedback during interaction. According to Long (1981, 1983, 1996), for example, learners improve in their language accuracy if they are provided with negative evidence during interaction. Long views negative evidence as a form of conversational and linguistic modification that promotes SLA. White (1987, 1989) also argues that positive evidence is not sufficient for L2 acquisition.

Very recently, several authors have further emphasized the role of noticing as a cognitive process that facilitates SLA. Schmidt (1990, 1993, 2001), for example argues that for SLA to take place, L2 learners need to notice the gap between their IL and the target language. In other words, noticing is the necessary condition for SLA. To Schmidt “intake is what learners consciously notice” (Schmidt, 1990; p. 149). Ellis (1995) puts forward the role of noticing in SLA in such simple words: “no noticing, no acquisition” (p. 89). Gass (1991) asserts that “nothing in the target language is available for intake into the language learners’ existing system unless it is consciously noticed” (p. 136). Skehan (1998) also agrees with Gass and asserts that as learners’ naturally focus on meaning, correction is required to draw their attention to grammatical form. Negative evidence, thus, can direct learners’ attention to the problematic forms (Gass, 1990). In brief, according to the advocates of negative evidence or corrective feedback, noticing is the condition for acquisition, and correction facilitates noticing.

2.2.2 Corrective feedback in SLA and L2 writing research

As discussed in the previous sub-section, there have been theoretical disagreements regarding the role of error correction in language acquisition. Similarly, the role of CF has also been addressed differently in the SLA and L2 writing research literatures. SLA research on CF has been mainly concerned with oral CF (Sheen, 2007).

Sheen adds that oral CF has been investigated by SLA researchers mainly to find out how this kind of feedback can facilitate the acquisition of a single/specific grammatical feature of an L2, and, on the other hand, L2 writing researchers investigated written CF to find out how feedback facilitates overall writing development. According to Ferris (2010), although L2 writing and SLA researchers investigate similar phenomena, it is important to understand that they do not necessarily ask the same questions. L2 writing scholars are, as Ferris asserts, “motivated by different questions and influenced by philosophical and theoretical paradigms distinct from those that affect SLA researchers” (p. 182). Ferris (2010) further clarifies that the studies of written CF designed by SLA researchers investigate if written CF aids long-term acquisition of specific linguistic features, and in contrast, L2 writing researchers investigate if written CF helps improve the overall effectiveness of students’ writing and make them more successful as writers.

There also has been an ongoing debate among written CF researchers regarding the role of corrective feedback in L2 acquisition and L2 writing development. The next section discusses further how this debate over the effectiveness of written corrective feedback in L2 writing originated and also sheds some light on the arguments put forward by both sides in this debate.

2.3 Differing Views on the Role of CF in L2 Writing

CF in writing has been a much debated and controversial topic in L2 teaching for many years. According to Hyland and Hyland (2006), “while feedback is a central aspect of L2 writing programs across the world, the research literature has not been unequivocally positive about its role in writing development” (p. 83). But prior to 1996,

the idea that CF helps L2 writers improve writing accuracy had rarely been challenged (Bitchener, 2008). The debate over the effectiveness of written CF started when Truscott made his remarks in 1996 that corrective feedback in L2 writing is ineffective and harmful.

Truscott (1996) argued that there is no clear definition of grammar correction and that the different types of correction teachers employ are not useful. Truscott cited several studies to support his claim. According to him, those studies demonstrated that no matter how much feedback L2 students have been provided with, they do not improve in writing. Ferris (1999) then argued against Truscott's claim on the ineffectiveness of grammar correction in writing. Ferris argued that "some potentially positive research evidence on the effects of grammar correction" have been "overlooked or understated" (Ferris 2004; p. 50) by Truscott. Based on the findings of the same research studies on which Truscott based his argument against grammar correction, Ferris (1999) argued that while some participants in those studies did not benefit from feedback, others did. In Ferris's opinion, this difference is due to the effect of different types of correction on different types of errors and concluded that, "in discussing whether or not grammar correction is 'effective,' it is important to know what sort of error correction we are discussing" (Ferris, 1999; p. 4). Furthermore, Ferris observed that learners like to be corrected in order to improve their grammatical accuracy and regarded this preference as a further argument in favor of correction. Truscott (1999) further responded to Ferris's (1999) rebuttal and stood by his claims. He argued that even if some participants benefited from error correction, the studies on grammar correction did not provide strong evidence in its support because learners who did not receive correction would eventually

improve their writing performance in any case. He asserted that even if students want grammar correction, it does not mean that teachers should give it to them. According to him, the students' preference for grammar correction is based on a "false faith" (p. 116) inculcated in them by their teachers.

Truscott (1996, 1999) and Ferris (1999) thus build their arguments based on their different interpretations of earlier studies of grammar correction in L2 writing. Both put forward strong arguments in their support. Their debate has drawn significant attention to the topic of 'error correction' or 'corrective feedback' in L2 writing. Ferris (1999) realized the importance of the debate and asserted that, "If nothing else, reading Truscott's essay and reviewing the primary sources he cites has highlighted for me the urgent need for new research efforts which utilize a variety of paradigms to examine a range of questions that arise around this important topic" (p. 2). According to Chandler (2003), "the one implicit point of agreement in Truscott and Ferris' articles was that the existing data are insufficient to resolve the question of whether error correction can be an effective way to improve the accuracy of L2 writing" (p. 268). Reiterating Ferris (1999) and Chandler (2003), Bitchener (2008) asserted that Truscott (1996, 1999) and Ferris (1999) demonstrated that "research evidence was limited in terms of the range of studies that had attempted to address the question of efficacy and in terms of the quality of the research design" (p. 102). Second language writing researchers, as a whole, feel the need for more empirical research on the effectiveness of corrective feedback in L2 writing, and since 1996, a significant number of empirical studies of written CF have been conducted and published in distinguished journals. Storch (2010) affirms that in the field of L2 writing research, written CF seems to have attracted the most attention recently. Storch adds that,

between the years 2006-2009, 16 articles on written CF were published in the 'Journal of Second Language Writing', whereas, 17 articles on the same topic was published in the previous 10 years in the same journal. Majority of these articles reported studies that investigated if CF in writing is effective (i.e., if it leads to improved accuracy of particular linguistic feature(s), and also to overall effectiveness of students' writing) and if so, which types of CF are more effective. According to Sheen, written CF studies fall into three major categories: “(a) studies that have examined the effect of CF on learners’ revised texts; (b) studies that have compared different types of CF- that is, feedback on form versus feedback on content, direct versus indirect correction, error code versus underlining- and (c) studies that have investigated the effect of CF on new pieces of writing over time” (Sheen, 2010, p. 172).

The following section presents a literature review of published research on corrective feedback in L2 writing.

2.4 Major Research Literature on Written Corrective Feedback in L2 Writing

This section presents a review of research literature that investigated the effect of corrective feedback on L2 writing in two parts. The first part reviews some of the early empirical research (published between mid-1980s and mid-2000) that had commonality in investigational aims and design. Part two presents a review of recent empirical corrective feedback studies (published between mid-2000 to the present) which are relatively distinct from the early ones due to their improved research design. Each part includes a review of the research design of the reviewed research in order to get clearer answers to the questions regarding the effectiveness of written CF from future research.

2.4.1 Early research

A number of L2 writing studies, published between mid-1980s and mid-2000, investigated the effectiveness of error correction in L2 writing. It's worth noting that, before the mid-1990s, empirical research investigating the effects of written CF was comparatively rare (Ferris, 2010). However, after a review of some of the written CF studies published between mid-1980s and mid-1990s, Truscott (1996) claimed that correction of errors in L2 writing was ineffective. Truscott (1996) recommended the evaluation criteria that "The researchers compare the writing of students who have received grammar correction over a period of time with that of students who have not" (p. 329), which was also supported by Ferris (1999, 2004). But as Ferris (2004) pointed out, only six of these studies (e.g., Ashwell, 2000; Fathman & Whalley, 1990; Ferris & Roberts, 2001; Kepner, 1991; Polio et al., 1998; Semke, 1984) did the 'correction/no correction' comparison, i.e., these examined if written feedback on students' writing helps them produce more accurate texts than those who do not receive any feedback. Some other studies investigated if students who receive corrective feedback on errors improve in accuracy over time (e.g. Chandler, 2003; Ferris, 1997; Frantzen, 1995; Lalande, 1982; Polio et al., 1998; Rob et al., 1986; Sheppard, 1992). The next two subsections present a discussion of most of these studies.

2.4.1.1 Studies investigating the effects of error correction on accuracy

Due to the ongoing debate on the effectiveness of teacher feedback on L2 writing and whether it improves grammatical accuracy, several researchers (e.g., Chandler, 2003;

Fazio, 2001; Ferris, 1997; Gascoigne, 2004; Lalande, 1982; Rob et al., 1986; Semke, 1984; Sheppard, 1992) investigated this topic.

Lalande (1982) wanted to find out what kinds of outcome different feedback mechanisms had on grammatical accuracy. The study was quasi-experimental and longitudinal in design. The participants were 60 intermediate level students learning German at an American university, who were divided into two control and two experimental groups. The 45-minute in-class essays were used as pretest and posttest. The same instructional material was used for all groups but the groups received different kinds of feedback. The control groups received direct feedback and teachers provided them with corrections. The participants here had to incorporate the corrections in their rewritten version. The essays of the treatment groups, on the other hand, were marked using error correction codes. Students in the treatment groups were required to interpret the codes, correct the errors and rewrite the full essay. They were also required to fill out an error awareness survey sheet as a second treatment to make them aware of their most frequent errors before writing their next essay. The findings of the study demonstrated that the experimental groups outperformed the control ones, i.e., the students in the experimental groups made fewer errors than the students in the control groups. However, Lalande (1982) concluded that more longitudinal case study was needed before these findings could be generalized.

Another study that measured the effectiveness of different types of feedback on students' writing abilities was conducted by Rob, Ross, and Shortreed (1986). The aim of this quasi-experimental research was to test the hypothesis that direct error-feedback treatments would have a significant effect on improving the students' overall writing

quality. The researchers investigated the effect of four types of error feedback: direct, coded, uncoded, and the number of errors per line. Participants were 134 Japanese college students and they were divided into four groups depending on the type of feedback they received. Each participant was required to produce five narrative compositions over a nine-month academic year. Students in all four groups were required to revise their weekly essays, based on the feedback provided by the instructor. Statistical analysis was used to assess the accuracy, fluency and complexity in writing. The findings demonstrated that the accuracy of all four groups improved but no statistically significant differences between the four feedback groups on any of the three measures (complexity, accuracy or fluency) were found. Rob et al. (1986) concluded that the study does not support the practice of direct correction of surface errors on students' writing.

Sheppard's (1992) study investigated the effects of two different ways of responding to students' writing: "discrete-item attention to form and holistic feedback on meaning" (p. 103). Participants were 26 college freshmen, who received a total of 35 hours of instruction for 10 weeks. The participants were formed into two groups and both groups wrote seven compositions on the same topic. Both groups differed only with respect to the type of feedback they received. The results of the study displayed that both groups gained improvement on one measure, i.e., the correct use of verbs. There was no improvement on the other measure, i.e., sentence boundaries. Sheppard also found that the group that received holistic comments did better than the group that received corrective feedback in terms of grammatical accuracy and linguistic complexity.

Ferris (1997) investigated the effect of teacher commentary on student essays. Her main aim was to investigate how teacher comments written in the margins or at the end of

students' essays improved the quality of students' second draft in terms of grammatical accuracy and also in terms of content. She also explored if the types of commentary were positive or negative and if they were in the form of question, requests, or imperatives. In particular, Ferris wanted to find out which types of teacher feedback: comments in the form of questions, requests, or imperatives are most effective on students' rewrites, and to what extent students made changes in their essays. For this investigation Ferris used 47 freshmen and sophomore students enrolled in an ESL composition class at an American university. The students were required to write four essays and a minimum of three drafts for each. Ferris examined over 1,600 marginal and end comments written on 110 first drafts. She then examined revised drafts of each paper to find out the influence of the commentary on the first drafts on the revised essays and see if the changes made according to the teacher's feedback improved the quality of papers. Four trained coders coded the essays to see which types of feedback influenced the students' revised versions the most in terms of accuracy and fluency. Ferris found that longer feedback had a greater effect on the revisions than short or general comments. She also found that marginal requests for information and grammar comments helped students write better drafts. Thus Ferris's (1997) study found a positive effect on students' revised drafts.

In order to test the true effects of feedback, several other researchers also compared the accuracy of different types of feedback. Fazio (2001) investigated the effect of three types of feedback: correction, commentaries, and a combination of the two on grammatical accuracy. One hundred and twelve grade 5 students from a school in Montreal, where the language instruction was French, participated in her study. The students were divided into three groups according to the type of feedback they received.

Data for this study comprised in-class journal writing, class observations and interviews. The findings of the study demonstrated that none of the three groups improved in their accuracy. Fazio, however, concluded that the lack of improvement probably was due to the short treatment time which might have affected the results.

Chandler (2003) also investigated the effects of different kinds of error correction on students' writing. He reported two studies investigating the effect of error correction in a journal article. In the first study Chandler tried to find out the answers to three research questions. First, he investigated if written feedback causes students to make fewer errors later in the semester. Second, he tried to find out if students who do not correct their errors marked by teachers make fewer errors in the next assignment. Third, he explored if there is any significant difference in the improvement of accuracy on the writing of the two groups (those who correct their errors and those who do not) by the end of the semester. The study was experimental in design with a treatment and a control group. The control group consisted of 16 students and the experimental group had 15 students. The two groups were required to write five written homework assignments about their lives. Each assignment was typed and five pages long. After the teacher gave feedback on the essays, the experimental group was asked to correct all the errors that the teacher underlined and on the other hand, the control group was required to correct their errors at the end of the semester. The findings of the study revealed that students in the control group, who did no correction of errors after each assignment, did not improve in accuracy. But the accuracy of writing improved significantly in the experimental group. Also, both groups showed a significant increase in fluency over the semester.

After finding a positive result in the previous study, in the second study Chandler (2003) wanted to explore how teachers should provide feedback to students to improve their writing. He investigated the effect of four different types of error correction on students' writing in this experimental study. As reported by Chandler, this second study was conducted in the same ESL writing course as the above study but in a different year with different students. In this study 36 students were asked to write 40 pages of autobiographical text over the semester instead of 25. The students were divided into experimental and control groups. Assignments written by students in both sections were corrected by teachers using four different types of error correction: correction, underlining describing the error, describing error only, and underlining only. Statistical analysis of the data revealed that students' accuracy and fluency in writing improved significantly over the semester. Results also demonstrated that feedback in the form of teacher correction, i.e., direct feedback and underlining had a statistically significant effect on students' essays but the other two feedback types did not. These findings are supported by Ferris's (1997) study (discussed above) and Gascoigne's (2004) study, which also found a positive effect of teacher feedback on students' writing.

Basing his study on Ferris' 1997 research, Gascoigne (2004) investigated if teacher feedback helped students improve their writing, and also tried to find out what factors of corrective feedback influence beginner students' writing. Twenty-five freshman students who were native speakers of English and enrolled in a French class participated in that study. Students were required to write 8 essays in class and the duration of each class was 50 minutes. After teacher commentary on the essays the students were asked to revise them. The effect of teacher commentary on students'

revisions was calculated on a scale of 0 to 6. Like Ferris' (1997) findings Gascoigne's study also found that corrective feedback improved students' writing.

Two other similar studies by Lee (1997) and Lizotte (2001) are worth mentioning here. As reported by Chandler (2003), in an experimental study (with experimental and control groups) with EFL college students in Hong Kong, Lee (1997) found that students were significantly more able to correct errors that were underlined than errors that were either not marked or only indicated by a check in the margin. Chandler (2003) also reported that Lizotte (2001) found gains with Hispanic bilingual and ESL students of a low-intermediate English proficiency. This study did not have a control group. Students' errors were corrected using codes and Lizotte indicated only the location of errors for student self-correction. This study revealed that the students reduced errors in their writing significantly over one semester. The students also made significant gains in fluency (numbers of words written in a specified amount of time).

The above section reviewed research that investigated the effectiveness of error correction on accuracy and found different viewpoints regarding the point. The next section explores studies that compared students who received feedback and those who did not.

2.4.1.2 Studies comparing feedback groups with no-feedback groups

According to Truscott (1996), without comparing groups receiving feedback to those who do not, no one can be sure about the benefits of feedback. It is clear from the review of the studies presented in the previous sections that more studies that compare groups receiving feedback to those who do not were needed and several researchers (e.g., Ashwell, 2000; Fathman & Whalley, 1990; Ferris & Roberts, 2001; Kepner, 1991; Polio

et al., 1998; Semke, 1984) responded to that call. This section reviews studies that made such comparisons.

In a pretest/posttest design study, Semke (1984) investigated the effects of direct and indirect error correction on L2 writing. 141 students studying at an American university in the third quarter of a first year German course participated in the study. The duration of the study was 10 weeks. The students were divided into 4 groups, as Semke wanted to find out the differences across groups receiving 4 types of comments/corrections on their journal entries. Group 1, i.e., the control group, received only comments but no error corrections on their assignments. Group 2 received error correction (direct feedback: teacher marked all errors and provided the students with corrections) only; group 3 received correction with comments (feedback on both form and content); and group 4 received coded feedback (errors in the assignments were indicated by codes and students were required to make necessary corrections and rewrite their assignments). The findings of this study indicated no significant differences in accuracy across treatment groups. Semke (1984) concluded that, “corrections do not increase writing accuracy, writing fluency, or general language proficiency, and they may have a negative effect on student attitudes, especially when students must make corrections themselves” (p. 195).

Fathman and Whalley (1990) explored the effect of four types of feedback on students' essays. The researchers focused on investigating feedback on form and content to find out the most effective type of feedback on students' writing. Participants were 72 intermediate ESL students. The participants were divided into four groups. Each group received a different kind of feedback. Group 1 received no feedback on their essays.

Group 2 received only grammar feedback. Here students found their errors underlined and they were required to correct them. Group 3 were provided with content feedback. And the essays of Group 4 were marked with both grammar and content feedback. It was found that both grammar and content feedback were effective. Grammar feedback was found to be more effective than content feedback alone as general content feedback did not point out the errors to the students. It was also found that students who rewrote their essays without receiving feedback improved both in fluency and content, which is indicative that rewriting in itself helps improve students' writing. Furthermore, it was found that students who received grammar feedback also improved their content.

Realizing that there was a need for more research on the effectiveness of written feedback, Kepner (1991) investigated whether there are any differences in grammatical accuracy between groups receiving error feedback and those who do not. The study was quasi-experimental in design and Kepner used treatment and control groups. The participants were 60 students enrolled in a Spanish class and they were divided into four groups. Two groups received feedback on their grammatical errors, while the other two groups received no such feedback. Participants were required to write journal entries as a response to each of their eight assignments. Statistical analysis of the data revealed that the error feedback group improved more than the control group by 15%, but according to Kepner it was not a significant improvement. Kepner concluded that error correction did not help students avoid sentence-level errors. Thus, these findings support Truscott's (1996, 1999) claim that error feedback is ineffective.

Polio, Fleck and Leder (1998) also explored the difference between feedback and no feedback groups. They examined whether students could edit their grammatical errors

on their revisions. The researchers hypothesized that no differences would occur between groups receiving training in grammar and editing and those who do not in terms of linguistic accuracy. The participants were 65 undergraduate and graduate ESL students enrolled in an English for academic purposes composition course at an American university. Data for the study comprised in-class essays written by the students, and their revisions. For the pretest, participants were asked to write a 30-minute essay at the beginning of the semester. After two days, students were asked to edit their essays in 60 minutes. This same process was repeated in week 15 of the semester to collect data for the posttest. The control group was asked to write journal entries all through the semester while they did not receive any kind of feedback. The treatment group, on the other hand, wrote journal entries, received feedback, reviewed grammar and was trained to edit texts. Statistical procedures were used to analyze their data. Like Kepner's (1991) study, the findings of this study showed that there were no significant differences between the accuracy of students who received error feedback and those who did not, and their accuracy did not change significantly from the first week to the end of the semester. Polio et al.'s (1998) study thus had conflicting results with Fathman and Whalley (1990) (reviewed early in this subsection) and two other studies conducted by Ashwell (2000) and Ferris and Roberts (2001).

In a longitudinal study (one-year period), Ashwell (2000) explored two research questions: i) whether mixing content and form feedback was more beneficial for writers than giving only one type of feedback and ii) whether teachers should give form feedback alone without any comments on content on the paper. For this study, Ashwell recruited 50 students who were enrolled in 2 writing classes. Both classes had the same proficiency

level and were taught by the same teacher (the researcher himself). These classes met once a week for an hour and a half. Each class was required to write four assignments and they produced three drafts for each assignment. In addition, students had a textbook that helped them with their sentence structures and they were asked to write diaries to help them with their fluency. Ashwell used the third writing assignment in the semester and its three drafts as data for this study. In a quasi-experimental design there were three treatment groups (who received three types of feedback) and one control group who did not receive feedback. Out of the three treatment groups, one group of students received content feedback on their first draft and form feedback on the second. Another group received form feedback first and then content. The last treatment group received both content and form feedback on their drafts. The findings of this study revealed that there were no significant differences between the three feedback groups. However, all three feedback groups outperformed the control one in formal accuracy. On the other hand, like Fathman and Whalley (1990), Ashwell found that the control group improved like the other groups because the rewriting helped them. In addition, Ashwell pointed out that the group which received both types of feedback on all their drafts improved in their writing slightly more than the other ones, but this difference was not statistically significant. Another finding was that mixing both types of feedback did not harm students' writing. Ashwell, however, pointed out the researcher being the provider of all feedback, lack of significant inter-rater reliability in the content quality check, small sample size, and lack of training of scorers as limitations to his study.

Responding to Truscott's (1996, 1999) recommendation, Ferris and Roberts (2001) also investigated the effect of different types of feedback and the difference

between feedback and no feedback groups. They explored three different types of feedback (coded, uncoded, and no feedback) in their study and there were four research questions. First, they wanted to find out if there were differences in student ability to self-edit errors based on different types of feedback (codes, no codes, no feedback) provided to them. Secondly, they wanted to explore if students corrected certain types of errors more than the other ones. Thirdly, they wanted to find out students' views about their own grammar needs and feedback preferences. And finally, they explored if prior grammar knowledge and awareness of error types influence students' ability to process feedback and self-edit their texts. A quasi-experimental design was used for the study. There were three treatment groups: coded, uncoded, and no feedback. There were 44 participants and they were randomly assigned to these groups. The researchers gave a pretest (a 50-minute in-class essay) to all of their participants, which were corrected by the researchers using the three types of feedback. The students then were asked to self-edit their essays. To find out students' views, the researchers used a five-item questionnaire to survey students' opinions about their experiences in studying English grammar, the problems they faced while writing essays and the feedback type they preferred. Statistical procedures were used to analyze the data. The findings of this study demonstrated that the two groups who received feedback significantly outperformed the no-feedback group. However, there were no significant differences between the coded and uncoded feedback. The participants edited "treatable" errors like verbs and nouns more successfully than untreatable errors such as word choice. As for the students' perception of error feedback, all students expressed that they expected feedback from the teacher and most of them preferred the coded feedback.

2.4.1.3 Summary of findings from early research

It is evident from the review presented in the two previous subsections that most of the studies that investigated the effect of error correction on accuracy had conflicting results regarding the effectiveness of error feedback. While some of these studies concluded that grammatical error correction is effective, others found grammatical error correction to be ineffective. Table 2.1 outlines the findings from the studies reviewed above.

Table 2.1 Summary of findings from early research on the effectiveness of error correction in L2 writing

Studies that claimed to have found positive evidence in support of the effectiveness of written CF:	Ashwell, 2000; Chandler, 2003; Fathman and Whalley, 1990; Ferris, 1997; Ferris and Roberts, 2001; Gascoigne, 2004; Lalande, 1982; Lee, 1997; Lizotte, 2001; Rob, Ross and Shortreed, 1986; and Sheppard, 1992.
Studies that did not find any positive evidence in support of the effectiveness of written CF:	Fazio, 2001; Kepner, 1991 ² , Polio, Fleck and Leder, 1998; and Semke, 1984.

As presented in Table 1, out of the 16 studies that were reviewed here, 12 show that written CF leads to the improvement of grammatical accuracy on L2 writing. But most of these studies were criticized due to research design flaws. Some of the most significant design flaws were: the lack of a control group; not measuring improvement of accuracy in new pieces of writing; and providing feedback on all the errors but not on one or only a few types of errors at a time (Bitchener, 2008; Ferris, 2008). A discussion on research design flaws has been presented in the following sub-section (2.4.1.4).

² Kepner's (1991) study revealed that the error feedback group improved more than the control group by 15%, but Kepner concluded it as not a significant improvement.

Which CF type is more effective- Direct or Indirect?

Also, as pointed out by Storch (2010), the reported results of the studies that considered the effect of different types of feedback are somewhat contradictory. Storch (2010) elaborates that Rob, Ross and Shortreed (1986), for example, found no differences based on different types of feedback. In Lalande's (1982) study, students who received indirect feedback made greater improvement than the students who received direct feedback. On the other hand, in Chandler's study (2003) students receiving direct feedback showed improvement in accuracy over students who received 3 different types of indirect feedback. Storch (2010) further adds that studies that investigated the effectiveness of different types of indirect feedback also generated mixed findings. She gave the example of Ferris and Roberts's (2001) study, where they found no significant difference on accuracy between two types of indirect feedback: underlining & underlining with codes. Chandler (2003), on the other hand, found significant accuracy gains in groups who received underlining as indirect feedback but not in groups who received underlining plus codes.

Based on the findings of these studies, some scholars (e.g., James, 1998; Doughty & Williams, 1998) have made a stronger case for the special value of providing indirect feedback rather than direct feedback. Others have argued in favor of a more direct approach (e.g., Ferris, 1999; Ferris & Roberts, 2001).

Which errors to correct?

While arguing for a direct approach, Ferris (1999, 2010) pointed out that any single form of feedback might not be effective for different types of errors. She made a

distinction between “treatable” errors (e.g., verb tense and form, subject-verb agreement, article usage; i.e., rule governed features) and “untreatable” errors (e.g., word choice, unidiomatic sentence structure, missing or unnecessary words, i.e., lexical issues or sentence structure), and suggested that feedback may be most effective if it focuses on “treatable” errors. Ferris’s (1999, 2010) prediction contradicts with that of Truscott (2001, 2007) who suggested that CF would be beneficial for errors “that are relatively simple and can be treated as discrete items rather than integral parts of a complex system” (Truscott, 2007; p. 258), for example spelling errors. Van Beuningen (2010) also pointed out that Truscott’s claim regarding the correctibility of certain types of errors contradicts with those of Ferris (1999, 2002, 2010), as according to Truscott, lexical errors are the most correctible L2 problems because they are relatively discrete. Whereas, according to Ferris “it is the idiosyncrasy of lexical errors which makes them less suitable targets for CF” (Van Beuningen, 2010). Ferris’s (2002, 2010) proposed distinction in error types and her claim about the effectiveness of feedback on ‘rule governed errors’, and Truscott’s claim about the correctibility of ‘lexical’ errors warrants further investigation, but only two studies (Ferris et al., 2000; Ferris & Roberts, 2001) made such an investigation.

As pointed out by Bitchener (2008), the findings of the studies offer insight into the relative effectiveness of different types of feedback, but they do not establish a clear superiority of one type of feedback over the other. According to Russell and Spada (2006), it is impossible to establish a clear pattern across these studies due to the dissimilarities in variables, design, and methodology. Other researchers such as Ferris (2004) and Guenette (2007) pointed out that this lack of conclusive results in support of

corrective feedback or one type of corrective feedback is due to poor research design and lack of comparability between studies.

The next subsection presents a brief discussion on the issues of research design flaws and lack of comparability of the early research on written corrective feedback.

2.4.1.4 Research design issues

As mentioned earlier, the early studies on written CF were criticized with regards to their research design (Storch, 2010). Some of the most significant design flaws pointed out by researchers (e.g., Bitchener, 2008; Ferris, 2008; Storch, 2010) are: the lack of a control group; not measuring improvement of accuracy in new pieces of writing; and providing feedback on all the errors (unfocused feedback) but not on one or only a few types of errors at a time (focused feedback).

Lack of a control group

Some of the reviewed studies did not compare the writing of the treatment group (the students receiving feedback) with the writing of a control group (students who did not receive feedback). The following table shows the studies that used and did not use a control group:

Table 2.2 Studies with and without control group

Studies without control group	Fazio, 2001; Ferris, 1997; Lalande, 1982; Rob et al., 1986; Chandler, 2003*
Studies with control group	Ashwell, 2000 ; Fathman and Whalley, 1990; Ferris and Roberts, 2001; Kepner, 1991; Lee, 1997; Polio et al., 1998; Semke, 1984

* Chandler claimed to have control group but learners in that group also received feedback. The only difference was that they were asked not to correct their errors until the end of the semester.

Ferris (1999, 2004) and Truscott (1996, 2004) both agree that studies that do not compare the effectiveness of corrective feedback versus no corrective feedback cannot provide evidence in support of the effectiveness of corrective feedback.

Measuring accuracy on revision only

One set of studies on written CF in L2 investigated the effectiveness of written CF on students' revisions of the same paper that received teachers' feedback. Examples of such studies are: Ashwell (2000); Fathman & Whalley (1990); Ferris and Roberts (2001); Rob et al. (1986). Learners in those studies did not have to produce a new piece of writing. Like Ferris (1999, 2004) and Truscott (1996, 2004), Bitchener (2008) also believes that to get a conclusive answer to the question of whether written CF is effective or not will not be possible if researchers do not "make a concerted effort to conduct well designed studies that examine over time the effectiveness of different corrective feedback options on new pieces of writing" (p. 103). Ferris (2010) further adds that other SLA researchers like Ellis et al. (2008) and Sheen (2007) also argue that "such studies are of

limited value because they do not demonstrate that the effects of written CF extend to further compositions” (p. 189).

Providing feedback on all errors

According to Storch (2010), several researchers like Bitchener (2008), Ellis, Sheen, Murakami, and Takashima (2008) and Sheen (2007) argued that another reason for the lack of evidence for the gains in accuracy from feedback is because learners in these early studies were provided with feedback on all errors (only exception was Fazio, 2001). They believe that feedback on all or different kinds of error might have overwhelmed the learners. Storch (2010) further adds that these researchers referred to oral corrective feedback studies in SLA, several of which (e.g., Doughty & Varela, 1998; Han, 2002; Lyster, 2004) have found positive effects of oral corrective feedback due to focusing on a single linguistic feature. Ferris and Hedgcock (2005) also recommend that teachers’ written CF should focus on the most serious and frequent errors in the students’ writing. Ellis, Sheen, Murakami, and Takashima (2008) also believe that directing and focusing learners’ attention to specific errors will facilitate their SLA. According to them, “learners are likely to attend to correction directed at a single (or limited number of) error type(s) [focused CF] and are more likely to develop a clear understanding of the nature of error and correction needed” (Ellis et al., 2008; p. 356).

Finally, as Ferris (2004) has pointed out, these early studies were very different from each other on different research parameters. Some of the parameters she pointed out are: “subject characteristics (for example American college foreign language students versus ESL students versus EFL students), size of samples and treatment groups, duration

of treatment or study period, types of writing being considered, types of feedback being given, who was providing the error feedback, how errors were defined and how accuracy and improvement were measured” (Ferris, 2004; p. 51-52). Due to such differences, Guenette (2007) and Storch (2010) add, comparison between these early studies is problematic.

Several most recent studies have tried to find a more conclusive answer to the question of the effectiveness of CF by addressing some of the research design flaws of the early studies through incorporating control groups and measuring improvement of accuracy in new pieces of writing. The next section presents a review of some of the most recent written CF studies with improved design.

2.4.2 Recent studies with improved design

This section reviews 16 recent studies (Baker and Bricker, 2010; Bitchener, 2008; Bitchener and Knoch, 2008; Bitchener and Knoch, 2009a; Bitchener and Knoch, 2009b; Bitchener, Young and Cameron, 2005; Ellis, Sheen, Murakami and Takashima, 2008; Ferris, 2006; Hartshorn, Evans, Merrill, Sudweeks, Strong-Kraus and Anderson, 2010; Liu, 2008; Sheen, 2007; Sheen, Wright and Moldawa, 2009; Storch and Wigglesworth, 2010; Truscott and Hsu, 2008; Van Beuningen, De Jong and Kuiken, 2008; Van Beuningen et al., 2012) on written CF to explore if the findings of these studies could provide a more conclusive answer to the question about the effectiveness of written CF. Most of the studies investigated the differential effects of different kinds of feedback and also, if corrective feedback improves accuracy over time on new pieces of writing (with exception of Ferris, 2006). Some of the studies that investigated the differential effects of

different kinds of feedback did not focus only on comparing the effectiveness of direct and indirect feedback but explored the effectiveness of different types of direct feedback (e.g., Bitchener, 2008; Bitchener et al., 2005; Bitchener and Knoch, 2009a & b; Sheen, 2007; Sheen et al., 2009). Some other studies investigated whether focused feedback is more effective than the unfocused feedback (e.g., Ellis et al., 2008; Sheen et al., 2009).

2.4.2.1 Research evidence for written CF

Some researchers, for example, Ferris (2003a & b) and Chandler (2003) argued for the superiority of one type of feedback over the other. Ferris (2003a & b) argued for the superiority of indirect feedback, on the other hand Chandler (2003) argued that direct feedback is more effective in improving L2 writing accuracy and facilitating SLA. Responding to the call of Ferris (2004) for more research in this area, Bitchener, Young and Cameron (2005) investigated whether different types of feedback on three targeted error categories helped L2 writers improve the accuracy of their use in new pieces of writing. The three categories that were analyzed are the definite article, prepositions, and the simple past tense. Participants were 53 upper-intermediate migrant learners, who were placed into one of three groups which met for 20, 10 or 4 hours per week, respectively. The first group received direct written feedback along with a five-minute conference with the researcher after completing each new composition. The second group only received direct written feedback, and the third group (the control group) did not receive any feedback on the linguistic accuracy of their writing, rather they received feedback on the quality of their content and organization. The researchers reported that there was no significant effect on accuracy when the three error types were considered as

a single group. But they reported that the combination of the direct written feedback and the conferences resulted in significantly higher accurate use of the definite article and the simple past tense (but not prepositions) in a new piece of writing. Bitchener, Young, and Cameron (2005) concluded that the finding that the positive effect of direct oral feedback in combination with direct written feedback is 'noteworthy' as no other study had investigated the effects of direct written feedback options on the improvement of accuracy before. The findings are also significant, as the researchers added, as it found that treatable grammatical errors, such as past tense and article errors, are more amendable when direct feedback is used in combination with oral direct feedback.

Ferris in 2006 investigated if corrective feedback improves accuracy over time. In particular, she wanted to find out if error feedback helps L2 writers improve their accuracy in the short term and in the long run (in revised text only, not on new piece of writing). She also wanted to explore if the feedback offered by teachers was accurate and complete, how different error feedback strategies used by teachers affected students' writing, and whether different types of errors are affected by error treatment differently. Participants were 92 ESL students, most of whom were pursuing undergraduate degrees at an American university. Three experienced teachers were appointed to study students' writing. The three teachers provided feedback on student essays in 15 error categories: word choice, verb tense, verb form, word form, articles, singular-plural, pronouns, run-on, fragments, punctuation, spelling, sentence structure, informal, idiom, subject-verb agreement and a miscellaneous category. Data mainly consisted of student written essays, interviews and an anonymous survey. A longitudinal approach was used to collect the data. The findings of the study demonstrated that students addressed the majority of the

errors identified by their teachers and that 80% of those revisions that were based on teacher feedback were corrected appropriately by the students. The findings also revealed that the teachers used indirect metalinguistic feedback with treatable errors (e.g., verb tense, form, and agreement), and direct feedback with untreatable errors (e.g., idioms and sentence structure). It was found that students were able to utilize both direct and indirect feedback, especially in revised texts. Ferris asserted that the findings of this study provided substantial evidence that “students who receive error feedback show progress in written accuracy over time” (p. 97). She also reported that, the instructor feedback was highly accurate (89.4%), as measured by the independent inter-rater reliability test. Ferris concluded that these results refute the claims of previous researchers that teachers give incomplete and inaccurate error feedback and that students either ignore teacher feedback or cannot utilize it effectively in revision. Ferris (2006) further added that the findings demonstrated the “superiority of indirect feedback over direct feedback for facilitating student writing improvement over time” (p. 98) and this contradicts the findings of Rob et al.’s (1986) study that “there was little difference in long-term achievement in accuracy related to the level of explicitness of error feedback” (p. 98). Thus Ferris’s (2006) study demonstrates the opposite result of Bitchener, Young, and Cameron’s (2005) study where they found positive effects of direct written feedback. But it’s worth noting that Ferris’s (2006) study did not have a control group and improvement of accuracy was not measured on a new piece of writing.

Like Ferris’ (2006) study, Sheen’s (2007) study also found the superiority of metalinguistic feedback over direct feedback. Sheen (2007) investigated the learners’ analytic ability in mediating the direct and metalinguistic feedback, two different types of

focused written corrective feedback on the acquisition of English articles. Participants were 91 adult ESL learners of various L1 background studying in the US. They were divided into two treatment groups and a control group. One of the treatment groups received “direct-only” feedback (“indicating the location of an error on the student’s text and the provision of the correct form by deleting and/or replacing the error or by adding a linguistic element” (Sheen, 2007; p. 262) , and the other received “direct metalinguistic” feedback (“indicating the location of an error, providing the correct form, and including metalinguistic comments that explain the correct form” (Sheen, 2007; p. 262). Sheen found that both the treatment groups outperformed the control group on the immediate posttests, and the direct metalinguistic feedback group performed better than the direct feedback group in the delayed posttest. Based on the findings, Sheen concluded that metalinguistic feedback is better than direct feedback.

Bitchener (2008) confirmed Bitchener et al.’s (2005) arguments that direct written feedback (FB) in combination with oral direct FB is more helpful in correcting treatable grammatical errors (such as past tense and article). Bitchener (2008) investigated the effectiveness of three different types feedback: direct corrective feedback with oral metalinguistic explanation, direct corrective feedback with written metalinguistic explanation, and direct corrective feedback only. Participants were 75 lower-intermediate international ESL students in New Zealand. The participants were divided into three treatment groups and one control group. Each of the treatment groups received feedback in one of these treatment types, but the control group did not receive any feedback. Feedback focused on two functional uses of the English article: referential indefinite ‘a’ and referential definite ‘the’. The findings demonstrated that all three treatment groups

outperformed the control group in the post-test. It was also found that the treatment groups retained significantly improved levels of performance in the delayed post-test which was conducted after two months. But notably, the two groups that received written or oral metalinguistic feedback along with direct feedback outperformed the group which received direct feedback only. Based on these findings, Bitchener (2008) advocated for a combination of direct and indirect metalinguistic feedback. But it is notable that this study did not have a treatment group to receive indirect feedback with indirect metalinguistic feedback, due to which it unclear whether the improved performance of the two groups (that received written or oral metalinguistic feedback along with direct feedback) is due to the direct feedback only or due to the direct oral/written metalinguistic feedback only.

In an extension of Bitchener's (2008) study, Bitchener and Knoch (2008) wanted to find out the extent to which targeted written CF helps ESL students improve their accuracy in a new piece of writing, if there was a differential effect of different written CF options on accuracy, and if written CF helps migrant (students who settled in New Zealand within an 18-month period) and international students (who were studying in New Zealand with international visas) differently. Data were collected from 144 international and migrant students studying at a private school in New Zealand. There were three treatment groups and one control group in the study. The target structures that received the treatment were the two functions of the English article system (indefinite article 'a' and definite article 'the') over the period of two months, and accuracy was measured by means of a pre-test, a post-test and a delayed post-test. The different written feedback options investigated were: direct corrective feedback, written and oral meta-

linguistic explanation, direct corrective feedback only, and no corrective feedback. The findings of the study revealed similar findings as Bitchener's (2008) study: the treatment groups outperformed the control group. No difference was observed between the three treatment groups. It also revealed that the students retained their level of accuracy while writing a new text seven weeks after the treatment session, and that there were no differences in the extent to which migrant and international students improved accuracy of their writing due to feedback.

Like Bitchener and Knoch (2008), Ellis et al. (2008) also investigated the effectiveness of written feedback on students' acquisition of definite and indefinite articles. They also investigated if there were any differential effects of focused and unfocused feedback on using these articles. To do so, they designed a quasi-experimental study. Forty-nine Japanese students studying English at a Japanese university were grouped into two experimental groups and one control group. One experimental group received focused correction, i.e., correction only on the articles. The other experimental group received unfocused feedback, which comprised correction of not only articles but other linguistic errors as well. All three groups had to take part in a pre-test, an immediate post-test and a delayed post-test, where the task involved narrative writing based on picture stories. The findings of this study revealed that both of the experimental groups gained improvement in accuracy in the use of articles on post-tests and the test involving a new piece of writing. On the other hand, as reported by Ellis et al. "the control group's use of articles was inconsistent manifesting marked fluctuations in accuracy from one time to the next" (p. 364). The feedback was equally effective for the focused and unfocused groups. Based on the findings, Ellis et al. concluded that corrective feedback is

effective as far as English articles are concerned. They further argued that the findings of their study refute the argument of some researchers (e.g. Doughty, 2003) that error correction only promotes metalinguistic understanding but not acquisition, and that written corrective feedback contributes to the development of both declarative knowledge and procedural ability.

In another more recent study, Sheen, Wright and Moldawa (2009) again investigated the differential effects of focused and unfocused written corrective feedback on the accuracy of definite and indefinite articles along with four other grammatical structures (copula 'be', regular past tense, irregular past tense and preposition). Participants in this study were 80 students from six intact adult intermediate ESL classes. The researchers used a quasi-experimental and 'pretest-treatment-posttest-delayed posttest' design. The participants were divided into three experimental groups (focused written feedback, unfocused written, and writing practice) and one control group. The target grammatical structure for the focused feedback group was the use of English definite and indefinite articles, and on the other hand, the target structure for the unfocused group comprised articles, copula 'be', regular past tense, irregular past tense and preposition. Sheen, Wright and Moldawa found that all three experimental groups demonstrated significant improvement in grammatical accuracy over time. However, like Sheen's (2007) study, only the focused group outperformed the control group. Based on the findings, the researchers concluded that "unfocused CF is of limited pedagogical value whereas focused CF can contribute to grammatical accuracy in writing" (p. 556).

Evidence in favor of written CF also came from Bitchener and Knoch (2009a & b). In a six month study, Bitchener and Knoch (2009a) investigated the relative

effectiveness of three different types of direct written corrective feedback on ESL students' writing. Thirty-nine low intermediate ESL learners in New Zealand were assigned to three groups: direct corrective feedback, written and oral metalinguistic explanation; direct corrective feedback and written meta-linguistic explanation; direct corrective feedback only. The participants had to produce four pieces of writing from pre-test, immediate post-test, and two delayed post-tests. The target grammatical structures were two English articles: referential indefinite "a" and referential definite "the". Group one received direct error correction directly above each functional error on both the paper along with written and oral metalinguistic explanation. The written and oral metalinguistic explanation comprised an explanation of the articles and an example of their use. Group two received direct error correction above each error along with written meta-linguistic explanation. Group three only received direct error correction above their errors. As stated by Bitchener and Knoch, the findings demonstrated "no difference in effect upon accuracy" (p. 322) between the three treatment options and that "the observable differences in effect for the three different types of written corrective feedback in the three post-tests were not statistically significant" (p. 327). Thus, like Bitchener (2008) and Bitchener and Knoch's (2008) study, this study also showed that direct feedback alone was more effective than additional provisions of written and oral meta-linguistic explanation, which according to Bitchener and Knoch (2009a) suggests that "the provision of error correction alone may be sufficient for learners at a low intermediate proficiency level" (p. 322).

Using a similar design, Bitchener and Knoch (2009b) investigated the accuracy in using the two functions of the English article system (referential definite article 'the' and

referential indefinite article ‘a’) of 52 low-intermediate ESL learners in New Zealand over a 10-month period by means of a pre-test–post-test design. The participants were assigned to four groups, each of which comprised 13 students. Group 1 received direct error correction above each targeted error and also written and oral meta-linguistic explanation; group 2 received direct error correction and written meta-linguistic explanation; group 3 received direct error correction only; group 4 was the control group and did not receive any feedback. The participants of this study received similar treatments as Bitchener and Knoch’s (2009a) study but one difference was that the students produced five pieces of writing (in pre-test, immediate post-test, and three delayed post-tests). The findings of this study revealed that all the three treatment groups outperformed the control group on all four post-tests and there was no difference in effectiveness between the three treatment groups. According to Bitchener and Knoch (2009b), this finding validates Sheen (2007), Bitchener (2008), and Bitchener and Knoch’s (2008, 2009a) findings that demonstrated the effect of corrective feedback on the use of articles on new pieces of writing over a 2-month period. Bitchener and Knoch (2009b) also asserted that “the enduring effect on accuracy over a 10-month period is clear evidence” that written CF can help ESL learners raise the level of accuracy in using “simple linguistic forms/structures like the two functional uses of the English article system targeted in this study” (p. 14).

Van Beuningen, De Jong and Kuiken’s (2008) study also reported accuracy gains on revised text following direct and indirect feedback; but on new texts, only direct feedback led to improved accuracy. In this study, as mentioned by Van Beuningen, De Jong and Kuiken (2008), they tried to overcome some of the methodological limitations

of previous studies (e.g., lack of control group and time-on-task differences) and wanted to find out if feedback on errors helps to improve accuracy in writing from an initial task to its revision and also to a later writing (i.e., new text). Also, they wanted to find out whether direct feedback or indirect feedback would be more effective. Sixty-two second-year Dutch secondary students from 3 pre-vocational education classes were selected for the study. The average age of the students was 14 years. They were randomly assigned to 4 treatment groups: 2 experimental treatments (direct feedback and indirect feedback) and 2 control treatments (practicing writing, and revision without feedback). Direct feedback was provided in the form of identifying the error and providing the target form. Indirect feedback consisted of an indication of error and its category. Feedback was provided on 9 error categories: word form (e.g., verb tense, singular-plural), word choice, spelling, word order, addition or omission of a word, incomplete sentences, punctuation, and capitalization. The findings of the study revealed that both groups receiving direct and indirect feedback demonstrated significant accuracy gains, but the direct feedback group outperformed those who did not receive any feedback or self-corrected their errors. As also mentioned earlier, although the results demonstrated short-term effects of both direct and indirect feedback, only direct feedback was found to have long-term effects on students' accuracy.

In a most recent study, Van Beuningen, De Jong and Kuiken (2012) found both short-term and long-term effectiveness of comprehensive CF. Their study investigated the effect of direct and indirect comprehensive CF on L2 students' written accuracy. In particular, the study aimed to find out the effectiveness of CF as a revising tool and also its capacity to help long-term accuracy development. Participants were 268 students

from four Dutch secondary schools with multilingual student populations. The present investigation included four sessions: a pretest session, a treatment/control session, a posttest session, and a delayed-posttest session. The treatment and control session took place one week after the pretest session, and the delayed posttest took place 4 weeks after the treatment session. Findings demonstrated that both direct and indirect CF led to improved accuracy in both the revision and in the new pieces of writing. The result further demonstrated that direct CF helped gain grammatical accuracy in new writing and students' nongrammatical accuracy benefited most from indirect CF. Based on the findings, Van Beuningen, De Jong and Kuiken (2012) declared comprehensive CF as a 'useful education tool' (p. 2).

Van Beuningen (2011) pointed out that most studies measured accuracy gains quantitatively, and very little is known about the ways learners engage with feedback they receive and how they benefit from it. Therefore, she conducted a case study with 4 participants selected from the quantitative study described above (the study was conducted in 2011 and published in 2012). This study also aimed to investigate the correctability of lexical and morphosyntactic errors to direct and indirect feedback. Van Beuningen reported that in compare to the overall quantitative measurement of accuracy improvement, the detailed qualitative approach provided additional and different information about the effectiveness of CF. Her study found that correction fostered long-term accuracy improvement and she concluded that the effectiveness of CF "may be mediated by factors such as learners' level of successful CF uptake, or the nature of the targeted error" (p. 91). Van Beuningen also asserted that this finding was in line with the suggestion in the literature that successful uptake might facilitate acquisition (e.g.

Chaudron, 1977; Lightbown, 1998; Loewen, 2004; Sheen, 2004; Swain, 1985), or could be a prerequisite for learning (e.g. Ferris, 2004). She also pointed out that “the idea behind this theorized relation between uptake and retention is that noticing is a necessary condition for acquisition (Schmidt, 1995), and that uptake might be interpreted as (one of the) manifestation(s) of noticing” (p. 119).

In another related study Sachs and Polio (2007) used think-aloud protocol to get insights on learners’ internal processes while attending to written feedback on a L2 writing revision task. Their study further aimed to investigate the effectiveness of reformulations versus written corrections, the relation between noticing and revision outcome, and also if think aloud while comparing reformulated writings make a difference in linguistic accuracy of learner revision. Fifteen adult learners of English were divided into three experimental conditions: error correction, reformulation, and reformulation + think-aloud condition. The verbalization in the reformulation + think-aloud condition displayed that noticing of feedback was related to accuracy of subsequent revision. The findings further demonstrated that that in terms of leading to short-term changes in linguistic accuracy on revisions, reformulations did not prove to be more helpful than error corrections.

Two other recent studies also shifted their focus from investigating the effectiveness of different feedback types on accuracy improvement to investigating how learners perceive feedback (e.g., Baker and Bricker, 2010) and process different written feedback (Storch and Wigglesworth, 2010). Baker and Bricker (2010) investigated if native English and ESL speakers perceive teacher written feedback differently. In particular, the researchers aimed to find out if “directness type of teacher written

feedback affected how quickly and accurately participants were able to identify the intent of the feedback and make corrections necessary” (p. 79). Seventy-one university students in a US university participated in this study, out of which 30 were native English speakers and rest of the 41 were ESL students. Two essays (a personal narrative and a scientific proposal) were used for tests in this study and each essay version included a set of six comments which were direct, indirect, or hedged. Teacher feedback included three positive and three negative comments, and negative comments required correction of the text. Data analysis revealed that both native English speaker and ESL students were faster at responding to direct than indirect and hedged written feedback. Baker and Bricker (2010) concluded that teacher feedback plays a significant role in helping students improve their writing and that “directness type affected how quickly and accurately participants responded to positive and negative teacher feedback” (p.75).

Most recently in 2010, Storch and Wigglesworth investigated the nature of learners’ engagement with the feedback they received on their writing. In particular, they wanted to find out: i) if learners process direct feedback differently from indirect feedback, ii) the factors that affect learners’ uptake of feedback when revising their text, and iii) the factors that affect learners’ retention of feedback when writing new texts. A case study approach was used for this study which included two groups of ESL learners, each comprised of 12 pairs. One group received direct feedback (in the form of reformulation) and the other received indirect feedback (in the form of editing symbols). Direct feedback involved rewriting the learners’ text and attending to grammatical and lexical errors without changing the meaning as much as possible. The indirect feedback comprised marking the text with codes corresponding to certain kinds of errors, which

were explained and exemplified in a handout. Data used in this study were collected from 3 sources: a) the feedback received on day 1 texts, b) the texts written by the pairs on day 1, revised on day 5, and written individually on day 28 (new writing), and c) the transcribed pair talk elicited during the feedback processing and the rewriting sessions on day 5. The transcribed pair talk was analyzed for language-related episodes (LREs: Swain & Lapkin, 1998). Like Ferris's (2006) study, the findings of this study revealed superiority of indirect feedback in that, indirect feedback elicited more LREs than direct feedback. According to Storch and Wigglesworth (2010), students who received indirect feedback, engaged with the feedback extensively and showed a high level of uptake³. The researchers also added that uptake and retention may be affected by different linguistic factors, for example, types of learners' errors, and their attitudes, beliefs, and goals. Thus, in Storch and Wigglesworth's (2010) view, "whether and which types of feedback is effective depend on a complex and dynamic interaction of linguistic and affective factors" (p. 329).

2.4.2.2 Research evidence against written corrective feedback

All the studies discussed so far reported positive evidence in support of written CF, and some of these studies found that direct and focused corrective feedback contributed to significant improvement in students' writing accuracy. But like some of the early research (e.g., Fazio, 2001; Kepner, 1991; Polio, Fleck and Leder, 1998; Semke,

³ As stated by Storch and Wigglesworth (2010), "the texts produced by the pairs after feedback were analyzed for evidence of uptake of the feedback given and texts produced individually in session 3 (*day 28*) for evidence of retention" (p 303. Italics added).

1984), a few recent research studies (e.g. Hartshorn et al, 2010; Liu, 2008, Truscott and Hsu, 2008) again concluded that written CF did not have any benefit.

In 1999, Ferris argued that Truscott's (1996) claim that written CF is ineffective could not be taken seriously as his claim was not made based on findings of a research study. Also, due to the incomparability of early research in terms of design, participants and methodology, she concluded that more research needed to be done to resolve this debate. Truscott responded to this call for research and he, along with his colleague Hsu, conducted a study in 2008 to see if the findings of that study would support Truscott's (1996) previous view.

Truscott and Hsu (2008) first argued in this research article that the previous research found positive effects of feedback on grammatical accuracy because they focused mainly on investigating students' ability to use corrective feedback to revise their first drafts. According to Truscott and Hsu, the findings obtained from revisions are not evidence of learning, as this improvement does not assure that students will be able to produce grammatically accurate texts in the future. Thus, the main aim of their study was to find out if error correction helps learners produce better texts in the future. Forty-seven students enrolled in a basic writing course at a public university in Taiwan were selected for this study. The students were divided into two groups: one experimental and the other control. Data were collected from an in-class writing assignment written during weeks 12-14. In week 12, students wrote a 30-minute guided narrative based on picture prompts. Errors in the experimental group were underlined by their teacher and the control group did not receive any kind of feedback. In week 13, the essays were returned to the students and they were asked to re-write their first draft. They were clearly instructed not to write

a new essay. One week after the revision, the participants were required to write a new narrative to find out their improvement from the first draft and the second. Comparison of the first draft with the revision revealed that the experimental group was significantly more successful in correcting errors than the control group. But the experimental group did not show any improvement in their third writing task, which was on a new topic. Based on this finding, Truscott and Hsu (2008) concluded that “improvements made during revision are not evidence on the effectiveness of correction for improving learners’ writing ability” (p. 292).

Liu (2008) also supports Truscott’s (1996, 2004) and Truscott and Hsu’s (2008) claim that the effectiveness of error feedback can only be assessed appropriately by measuring accuracy on new texts. To further test this claim, Liu (2008) conducted a quasi-experimental classroom study of 12 university ESL students’ ability to self-correct their writing based on two kinds of feedback: i) direct correction, with the correct form provided by the teacher and ii) indirect correction, indicating that the error exists but without providing the correction. The students were randomly divided into two groups, one of which received direct feedback (errors were underlined and corrected) and the other received indirect feedback (errors were only underlined but not corrected). Data sources were the “two drafts of the first essay and the first draft of the second essay” (Liu, 2008; p. 69). Both groups had to submit a second draft after revising the errors. The students wrote the second essay four weeks after the second draft of the first essay was collected. Instances of errors were then identified and classified into three categories: morphological errors, semantic errors, and syntactic errors. Liu calculated the error ratios (the number of errors counted divided by the number of words written) and compared

between drafts and between groups. Liu (2008) found that both types of feedback helped students self-edit their texts. Furthermore, like Truscott and Hsu's (2008), it was found that direct feedback helped students reduce errors in the immediate draft but it did not improve students' accuracy in a different paper. Indirect feedback was found to be effective in helping the students reduce more morphological errors than semantic errors in a new piece of writing. Based on the findings Liu concluded that "providing corrective feedback on students' writing is not a sufficient way to improve students' accuracy in writing" (p. 65)

In a very recent study, Hartshorn et al. (2010) tested the effects of an instructional methodology on ESL writing accuracy, which they referred to as 'dynamic WCF' (i.e., dynamic written corrective feedback). As clarified by Hartshorn et al., dynamic WCF reflects what the individual learner needs most and is meaningful, timely, constant, and manageable for both student and teacher. The main aim of their study was to investigate the effect of written feedback on ESL writing accuracy, but the accuracy was measured within the context of its overall effect on rhetorical competence, writing fluency, and writing complexity. According to Hartshorn et al. (2010), accuracy needs "to be examined within the context of the rhetorical competence reflected in the writing, as well as its writing fluency and writing complexity" due to "any potential trade off effects that might be observed among complexity, fluency, and accuracy" (p. 90). Forty-seven advanced-low to advanced-mid ESL students studying at an American university were divided into two groups: treatment group (28 students) and a contrast group (19 students). The treatment group received instruction in the 'dynamic WCF' method and the contrast group was taught using the traditional approaches to process writing, which included

feedback on the linguistic accuracy along with rhetorical feedback. Both groups studied English intensively for 15 weeks, and the students in the treatment group wrote 10-min compositions almost every day during the course. They received indirect feedback in the form of coded symbols and most frequent types of errors were addressed by the teachers in class. The findings revealed that the mean accuracy scores of the students in the treatment group were relatively higher than the students in the contrast group. But there were no statistical differences between the two groups in terms of their mean rhetorical competence ratings, writing fluency scores, or writing complexity scores. The researchers concluded that, although dynamic feedback helped to improve writing accuracy, this pedagogy did not have much effect on rhetorical competence, writing fluency and writing complexity.

2.4.2.3 Summary of findings from the recent research

Most of the recent studies reviewed in the previous section mainly investigated: i) whether written CF contributed to improved accuracy on the revised texts and also on the new texts, and ii) whether one type of feedback is more effective than another (e.g., the effect of direct vs indirect feedback, focused/targeted vs. unfocused/untargeted feedback, and different types and options of direct feedback).

Is written corrective feedback effective?

In response to the first question, the review demonstrated that, while most of the early research could not find significant effects, almost all the recent studies (except Truscott and Hsu, 2008; Liu, 2008, Hartshorn et al., 2010) found positive and significant

effects of written CF. In a more recent study, Van Beuningen et al. (2012) found improvement of accuracy both in revision and in new pieces of writing. Truscott and Hsu (2008) and Liu (2008) found accuracy gains on the revised texts but not on the new texts. Like Truscott and Hsu (2008) and Liu (2008), Van Beuningen et al. (2008) also found improvement in accuracy on revised texts only from direct and indirect feedback, but on the later version or new text, only direct feedback was reported to have resulted in improved accuracy. Notably, Hartshorn et al. (2010) found relatively higher accuracy gains in the treatment group than the contrast group as a result of providing their dynamic feedback, but as they measured accuracy within the context of its overall effect on rhetorical competence, writing fluency, and writing complexity, they concluded that the dynamic feedback did not have any significant effect on these. Remarkably, these studies (Truscott and Hsu, 2008; Liu, 2008; Hartshorn et al., 2010; Van Beuningen et al., 2008) did not provide subjects with feedback on any specific type or types of error; rather, feedback was provided on several error categories and thus was unfocused. On the other hand, most of the studies that reported positive effects of written feedback on accuracy (e.g., Bitchener, 2008; Bitchener & Knoch, 2008; Bitchener & Knoch, 2009a; Bitchener & Knoch, 2009b; Bitchener, Young & Cameron, 2005; Ellis, Sheen, Murakami & Takashima, 2008; Sheen, 2007; Sheen, Wright & Moldawa, 2009) targeted limited number of grammatical structures⁴ (e.g., their focus was only on articles, past tense and prepositions). Only one exception is Van Beuningen et al.'s (2012) study, which provided direct and indirect comprehensive (i.e., unfocused) feedback and found accuracy gains both in revision and in new pieces of writing.

⁴ Except Ferris (2006), who provided feedback on 15 error categories.

Which type of feedback is more effective?

For the second question, whether one type of feedback is more effective than others, the answer is not very straightforward. The types of feedback investigated in the reviewed studies are: direct vs. indirect feedback, and focused vs. unfocused feedback, and different types of direct feedback.

A limited number of studies investigated the effectiveness of direct vs. indirect feedback among which some found the effectiveness of indirect feedback (e.g., Ferris, 2006) and metalinguistic feedback (e.g., Sheen, 2007) over direct feedback, and some found direct feedback as effective (e.g., Van Beuningen et al. 2008). In Van Beuningen et al.'s (2008) study, direct feedback was found to have produced more significant accuracy gains on new texts, although they found effectiveness of both direct and indirect feedback on revised texts. Researchers thus have disagreement over the effectiveness of direct vs. indirect feedback. Ferris (2003a, 2006), for example, argued that indirect feedback is superior to and more valuable than direct feedback. She believes that indirect feedback has long-term effects on the accuracy of students' writing and that it makes students engage in problem-solving learning and become independent learners. According to Sheen (2007), the distinction between direct and indirect feedback is explained well if we consider their differences as the differences between the awareness at the level of noticing and at the level of understanding. Sheen adds that, direct corrective feedback helps learners notice examples of specific forms, and on the other hand, indirect feedback helps learners not only notice the forms but also know the rules behind the forms, which is metalinguistic feedback. Sheen believes that metalinguistic feedback facilitates noticing and understanding at the same time, but direct feedback facilitates noticing of

the erroneous forms only. Therefore, to Sheen, metalinguistic feedback is better than direct feedback. On the other hand, according to Ellis et al. (2008), indirect feedback assumes that the erroneous forms are already known by the learners, as it expects learners to self-correct their errors. Thus indirect feedback cannot lead to new learning.

It's worth noting that studies comparing direct vs. indirect feedback (e.g., Ferris, 2006, Van Beuningen et al., 2008) addressed a wide range of grammatical structures. But several studies (e.g., Ellis et al., 2008, Sheen, 2007, Sheen et al., 2009) investigated the effects of focused feedback (i.e., feedback directed at specific linguistic error) vs. unfocused feedback. Based on the findings, these researchers concluded that focused error correction positively contributes to accuracy gains in writing, and that direct feedback benefits learners the most. However, Ellis et al.'s (2008) hypothesis that focused feedback would be more effective in promoting writing accuracy than unfocused feedback was not confirmed in their study. Rather, their findings showed that both focused and unfocused metalinguistic feedback were effective in improving accuracy in the use of English articles. Thus, these findings are not conclusive, as pointed out by Sheen (2010), since all these studies focused their investigation on same grammatical feature, English articles, "so it is not clear whether focused correction will prove generally effective in improving learners' linguistic accuracy" (p. 173).

The studies that investigated the effectiveness of direct feedback alone vs. those that investigated direct feedback together with written or oral metalinguistic feedback also demonstrated mixed findings. For example, Bitchener et al. (2005) found superiority of the combination of direct oral metalinguistic feedback and direct written feedback over direct written feedback alone. In Sheen's (2007) study, the direct metalinguistic feedback

group performed better than the direct feedback group in the delayed posttest. Bitchener's (2008) study demonstrated that the two groups that received written or oral metalinguistic feedback along with direct feedback outperformed the group which received direct feedback only. On the other hand, in Bitchener and Knoch's (2008) study, no difference was observed between the three treatment groups (direct corrective feedback, written and oral metalinguistic explanation, and direct corrective feedback only).

Which errors to correct?

As pointed out in the subsection 2.4.1.3., the relative effectiveness of written CF on 'grammatical errors' and 'non-grammatical errors' was not clear from the early studies. There is no conclusive answer to the question of which errors to correct from the findings of the most recent studies as well. This is due to the fact that none of the recent studies have investigated Ferris's (1999, 2002, 2010) claims about the effectiveness of direct and indirect feedback in reducing 'grammatical errors'. Furthermore, Truscott's (1996, 2001, 2007) claim regarding CF's effectiveness in the reducing 'lexical errors' has not been explored as well.

2.4.2.4 Research design issues

As mentioned earlier (in section 2.4.1.4.), the early studies on written CF faced criticism because of their flaws in research design. The early studies were evaluated in this paper based on some of the most significant design flaws pointed out by researchers (e.g., Bitchener, 2008; Ferris, 2008; Storch, 2010): the lack of a control group; not measuring improvement of accuracy in new pieces of writing; and providing feedback on

all the errors (unfocused feedback) rather than on one or only a few types of errors at a time (focused feedback). The limitations of the early studies help us understand why the findings from those studies were inconclusive (Sheen, 2010). This section evaluates research design issues of the recent studies considering these same three factors to show if, and how, the recent studies addressed those flaws.

The following table first summarises the studies that did and did not account for these three factors.

Table 2.3 Summary table of studies considering the three factors: control group, measuring accuracy on new pieces of writing, and focused/ unfocused feedback

Studies with control group	Bitchener, 2008; Bitchener and Knoch, 2008; Bitchener and Knoch, 2009a; Bitchener and Knoch, 2009b; Bitchener et al., 2005; Ellis et al., 2008; Ferris, 2006; Sheen, 2007; Sheen et al., 2009; Truscott and Hsu, 2008; Van Beuningen et al., 2008; Van Beuningen et al., 2012.
Studies without control group	Baker and Bricker, 2001; Ferris, 2006; Hartshorn et al., 2010; Liu, 2008; Storch and Wigglesworth, 2010.
Studies that measured accuracy on new pieces of writing	Baker and Bricker, 2010; Bitchener, 2008; Bitchener and Knoch, 2008; Bitchener and Knoch, 2009a; Bitchener and Knoch, 2009b; Bitchener et al., 2005; Ellis et al., 2008; Ferris, 2006; Hartshorn et al., 2010; Liu, 2008; Sheen, 2007; Sheen et al., 2009; Storch and Wigglesworth, 2010; Truscott and Hsu, 2008; Van Beuningen et al., 2008; Van Beuningen et al., 2012.
Studies that did not measure accuracy on new pieces of writing	Ferris, 2006; Hartshorn et al., 2010.
Studies that provided focussed feedback	Bitchener, 2008; Bitchener and Knoch, 2008; Bitchener and Knoch, 2009a; Bitchener and Knoch, 2009b; Bitchener et al., 2005; Ellis et al., 2008; Sheen, 2007; Sheen et al., 2009.
Studies that provided unfocussed feedback	Hartshorn et al., 2010; Liu, 2008; Truscott and Hsu, 2008; Van Beuningen et al., 2008; Van Beuningen et al., 2012.

Control group factor

As presented in table 2.3, ten of the recent studies (except Baker and Bricker, 2010; Ferris, 2006; Hartshorn et al., 2010; Liu, 2008, Storch and Wigglesworth, 2010) had control groups. Notably, in Van Beuningen et al.'s (2008) study, there were two control groups: one practiced writing only and the other did revision without feedback.

Factor of measuring accuracy on revised vs. new writing

Thirteen studies out of 15 that have been reviewed in this paper measured improvement of accuracy on new pieces of writing. Two studies that measured accuracy on revised papers only are Ferris (2006) and Hartshorn et al. (2010).

Focused/unfocused feedback factor

As also mentioned earlier in section (2.4.2.3.) unlike early studies, most of the recent studies provided feedback on specific types of errors (focused feedback). For example, Bitchener et al., (2005) provided feedback on the definite article, the simple past tense, and the use of prepositions. Other researchers, e.g., Bitchener (2008), Bitchener and Knoch (2008), Bitchener and Knoch, (2009a), Bitchener and Knoch (2009b), Bitchener, Young and Cameron (2005), Ellis, Sheen, Murakami and Takashima (2008), Sheen (2007), Sheen, Wright and Moldawa (2009), focused their feedback on English article system. Unfocused feedback on learners' writing was provided by Truscott and Hsu (2008), Liu (2008), Hartshorn et al., (2010), Van Beuningen et al., (2008).

Therefore, based on these findings, it can be concluded that most of these recent studies have tried to successfully address the research design flaws pointed out by researchers in the early research. Storch (2010) attributed this success to the fact that except for Hartshorn et al.'s (2010) classroom based study, almost all other recent studies are experimental or quasi-experimental and non-classroom based studies. Hartshorn et al.'s study thus lacked a control group vs. treatment group design. However, as most of the reviewed recent studies had a control group, their findings about the relative effectiveness of different types of feedback are valuable. According to Guenette (2007), without a control group the argument for the effectiveness of written feedback cannot be valid. Ferris (1999, 2004) and Truscott (1996, 2004) both also agree that without comparing the effectiveness of corrective feedback and no corrective feedback no study can provide evidence in support of the effectiveness of corrective feedback. Thus, claims by researchers from their studies regarding the effectiveness of certain types of feedback cannot be considered valid. For example, Ferris's (2006) claim that indirect feedback is more effective than direct feedback cannot be well established. Due to the lack of control group in her study, it is hard to decide whether the students improved in accuracy was caused by the feedback alone or because of other variables.

Again, while some researchers questioned the approach of providing unfocused feedback on several error categories, some questioned providing feedback only on limited grammatical structures. In Bitchener's (2008) view, it is impossible to decide exactly where an error lies if error categories are too broad. Ellis et al. (2008), believes that, "learners are likely to attend to correction directed at a single (or limited number of) error type(s) [focused CF] and more likely to develop a clear understanding of the nature of the

error and correction needed” (p. 356). On the other hand, Storch (2010) questioned the generalizability of conclusions about the efficacy of written CF on the basis of evidence on only a limited number of structures. In her opinion, “researchers who focus only on one structure may find few instances of such structures in their students’ writing” (Storch, 2010; p. 41). In Sheen’s (2010) opinion, studies that have all investigated the same grammatical feature (e.g. English articles), could not make it clear “whether focused correction will prove generally effective in improving learners’ linguistic accuracy” (p. 173). But Sheen (2010) added that investigation of written CF is a “worthwhile endeavor”, as these studies demonstrated that written feedback can be effective at least when focused on a single linguistic feature.

Another area of concern, as also pointed out by Storch (2010), is the length and duration of the feedback treatment in the recent studies. Storch (2010) indicated that most of the recent studies (e.g., Bitchener, 2008; Bitchener & Knoch, 2008; Bitchener & Knoch, 2009a; Bitchener & Knoch, 2009b; Sheen, 2007; Van Beuningen et al. 2008) used ‘one-shot’ designs, where feedback was provided only on one occasion and on a single text. She also pointed out that, in some studies where direct feedback was provided with or without written explanations (e.g., Bitchener & Knoch, 2008), the participants were given only a few minutes to go through the feedback before writing a new text in an immediate posttest. Storch (2010) further asserted that, “brief treatments may be easier to implement and control when conducting experimental studies, but lack theoretical and pedagogical validity”, since according to the theories of SLA, “learning requires extensive and sustained meaningful exposure and practice” (p. 42).

2.5 Current Study

Although recent studies have claimed to have found positive effects of CF, findings about the effectiveness of direct and indirect feedback from these studies are still inconclusive. Furthermore, these studies have focused their investigation on finding the effectiveness of direct feedback only, provided unfocused feedback (i.e., provided CF on limited grammatical structures), and have also used ‘one-shot’ designs, where feedback was provided only on one occasion and on a single text (Storch, 2010). In addition, only a few of these studies have investigated Ferris’s (1999, 2002, 2010) claims about the effectiveness of direct and indirect feedback in reducing ‘rule-governed’ or ‘grammatical’ errors and Truscott’s (1996, 2001, 2007) claims about the effectiveness of direct and indirect feedback in reducing ‘lexical’ errors.

The review of the recent studies also calls for more research to investigate learners’ attitudes and perspective on feedback. Notably, out of all the reviewed studies, Sachs and Polio (2007) and Storch and Wigglesworth (2010) are two of the few studies that investigated the nature of learners’ engagement with the feedback they receive on their writing. They concluded based on their findings that, “whether and which types of feedback is effective depend on a complex and dynamic interaction of linguistic and affective factors” (p. 329). Referring to a case study by Hyland (2003), Storch (2010) asserts that learners’ motivation and confidence as writers may be negatively affected by the feedback they receive. Storch also pointed out that the findings of Storch and Wigglesworth (2010) also revealed that “learners’ attitude towards the feedback affects not only whether and how learners respond to the feedback provided, but ultimately whether there is long term learning” (p.44). Storch further argued that experimental

research does not have any merit on the topic of learners' attitudes towards feedback and she proposed that "future studies need to adopt a more qualitative and ecologically valid research design" (p. 44) like their study. Therefore, more research addressing these above mentioned issues needs to be conducted to get a clearer idea about the effectiveness of direct and indirect CF in reducing errors in L2 students writing.

Accordingly, the current research investigated the effectiveness of direct and indirect written CF in response to both grammatical and non-grammatical errors. Note that the grammatical and non-grammatical errors categories in the present study are bigger than Ferris's (1999, 2010) treatable and non-treatable error categories, and also, as the notion of treatability and non-treatability of errors from different types of CF is problematic, the researcher of the present study decided to group errors into grammatical and non-grammatical categories (instead of treatable and non-treatable). In the present study the errors in the syntax of a sentence have been considered as grammatical errors, and the lexical errors (e.g., word choice errors, spelling errors, punctuation errors) are categorized as non-grammatical errors. Please see section 4.1 for a detailed description of grammatical and non-grammatical error categories.

CF was provided on all errors, i.e., this study involved comprehensive CF. Comprehensive CF was provided in the present study as most of the previous studies provided CF only on limited grammatical structures, and the conclusions about the efficacy of written CF on the basis of evidence on the limited number of structures were questioned by several researchers (e.g., Sheen, 2010; Storch, 2010). The current research also provided CF treatment three times on three different texts to make sure that participants are provided with an opportunity of 'meaningful exposure and practice' (Storch, 2010) of the target feedback. As it is mentioned earlier, in most of the previous

research CF treatment was provided only one time on a single text and that was questioned by some researchers in that brief treatments may lack theoretical and pedagogical validity (e.g., Storch, 2010). As Van Beuningen (2011) pointed out, the most important concern of SLA research is the long-term effect of CF or L2 development, and Truscott and Hsu (2008) also argued that to investigate the potential effects of CF, research should compare two independent written works instead of comparing an initial text to its revision. Therefore, the present research also investigated both short-term and delayed effects of comprehensive CF on written accuracy.

In addition, this research investigated learners' attitude towards the feedback they received on their writing, and also their motivations behind the way they dealt with the feedback they received. Students' attitude is one of the main factors that determine their success in language learning (Candlin & Mercer, 2001). Also, according to McGroarty (1996), attitude has cognitive and affective components, and it also involves beliefs, emotional reactions and behavioural tendencies related to the object of the attitudes. As corrective feedback is provided for the benefit of the learners, understanding their attitudes and preferences are important. According to Allwright (1975), as referred by Chenoweth et al. (1983), the effectiveness of the treatment of an error will depend on how it is perceived by the second language learner rather than what it was intended to be by the teacher. Thus, if the learner has a negative reaction to error correction, the desired changes outcome from particular type of feedback may not be brought about.

Understanding learners' attitudes towards direct and indirect CF and different types of errors is further important as, according to Ellis (2009), severity of an error is a matter of personal opinion and "there are no theoretical grounds on which teachers or

researchers can decide whether an error is simple or portable” (Van Beuningen, 2010; p. 13). This research project, therefore, also investigated the attitudes and preferences of L2 writers to determine their motivations and reactions to the correction of their mistakes by their teachers. A stimulated recall interview technique was used to elicit learners’ perceptions and attitudes. Stimulated recall is a “technique used to collect learners’ introspections about the learning process”, in which “following a language learning experience, learners are presented with a stimulus, and are asked to report their thoughts at that time” (Mackey 2006; pg. 416). Treatment (corrective feedback) was provided in students’ writings more than one time. This study, therefore, overcomes the methodological shortcomings of the previous studies (e.g., lack of control group, providing feedback on one type of error, providing CF on one occasion).

2.5.1 Research questions

The present study addresses the following research questions:

- 1) Does comprehensive written CF have any effect on the accuracy of L2 learners’ revision of the same piece of writing?
- 2) Does comprehensive written CF have any transfer effect on the accuracy of L2 learners’ new pieces of writing over time?
- 3) Does the effect of CF depend on the type of FB (direct vs. indirect)?
- 4) Does the effectiveness of CF depend on the type of errors (‘grammatical’ vs. ‘non-grammatical’)?
- 5) What aspects of CF do learners consider useful for successful correction of errors?

- 6) What are the learners' perceptions and attitudes towards the type of errors corrected?
- 7) What are the learners' perceptions and attitudes towards the type of feedback they received?

CHAPTER THREE – RESEARCH METHODOLOGY

This chapter describes the methodology used in the study. The first section describes the study design. Section two describes the participants of the study. Section three describes the treatment groups. Section four describes the writing tasks and prompts used in the study. Section five provides an account of the treatment procedure. Section six describes the interview sessions and the interview questionnaire. Finally, section seven describes data processing.

3.1 Research Design

This study employed a mixed method research design. Employing the quantitative method, this study investigated the effects of direct and indirect WCF on students' revision accuracy of the same piece of writing as well as its transfer effects on new pieces of writing over time. The qualitative method employed a stimulated recall strategy (as defined in the previous section, stimulated recall is a technique used to collect learners' self-analysis or reflections about the learning process) to explore students' perception and attitude regarding the types of feedback they received. The stimulus in this research was students' original writings or their revisions.

Unlike other major studies (e.g. Truscott & Hsu, 2008; Van Beuningen et al, 2012), who provided CF treatment only one time, the current study provided treatment three times to identify both the short-term and delayed effects of direct and indirect feedback in error reduction on revisions and on new texts. This design is thus unique in that it allowed students in the treatment groups to receive feedback on more than one occasion (three times) on three different new writings, and they also produced one new

piece of writing two weeks after they received their last CF treatment. The feedback treatment in this study was provided by the researcher of the present study outside the classrooms, after the regular school hours.

3.2 Participants

Fifty-three adult intermediate ESL students studying at two ESL schools in Canada participated voluntarily in this study. Intermediate level students were selected as they were expected to have gained sufficient writing proficiency needed to produce the writings required. Also, intermediate level students are more likely to try out the target language more and are expected to make grammatical and lexical errors in writing (Brown, 2007). Learners' proficiency level was determined based on a placement test learners had received prior to the study. All the ESL students participating in the study had been required by their school to take a placement test to be placed at the appropriate level. The test, which had been designed by the schools, tested all four proficiency skills (i.e., reading, writing, speaking and listening). To measure learners' speaking and listening skills, the placement tests had used structured interview tasks, and to test learners reading and writing skills, the placement tests included several reading comprehension as well as paragraphs and essay writing tasks. Based on the placement test score, students at both ESL schools had been placed in the beginning, intermediate, and advanced level ESL classrooms.

Most of the participants were of East Asian origin: 39% from South Korea ($n = 21$), 34% from Japan ($n = 18$), and 7.5% from Taiwan ($n = 4$). Other participants were from Brazil ($n = 3$) Saudi Arabia ($n = 2$), Switzerland ($n = 2$), Germany ($n = 1$), Mexico

($n = 1$), and Colombia ($n = 1$). The participants varied in age from 18 to 40 ($M = 25.43$, $SD = 5.0$); the majority (81%) were in the age range of 20 to 30. The youngest two being 18 and 19 years old, and there was only one 40-year old participant.

There were 17 male (32%) and 36 female (68%) students. Nineteen participants (36%) completed their high school education and were studying at the undergraduate level university courses. Thirty-one participants (58%) reported that they completed their college or university education. Two participants reported completing vocational education and training in Nursing, and one participant reported holding an MBA degree.

All the participants indicated that English was their second language. The amount of time they lived in Canada varied from 7 days to 16 months. 26% ($n=14$) of the participants reported they lived in Canada for 3 months. Eight other participants reported they lived in Canada for two months, and 9 participants reported living in Canada for one month. Before participating in the study, 4 other participants lived in Canada for just 1 week and only 1 participant lived in Canada for 16 months. The background questionnaire revealed that 87% ($n= 46$) of the participants indicated the reason for studying English at their current program was “to improve English skills in an English-speaking setting”, and only three participants (5%) indicated their reason for studying English as “to go to university in Canada/US”.

Out of the 53 participants, only 7 reported they had taken an ESL writing course before. To avoid potential effect on students writing development, only the students who were not enrolled in any ESL writing course or program during the span of data collection were considered as participants for the study. During the period of data collection, all the participants were enrolled in the intermediate level general English

classes. These classes are taught following a communicative approach and focus heavily on the development of students' listening and speaking skills by doing authentic and real-life activities and tasks.

3.3 Treatment Groups

For the purpose of the study, participants were randomly divided into four groups: three experimental feedback groups (A, B, and C) and one control no feedback group (D). Each of these groups is described below.

Experimental group A: Direct CF

Experimental group A was a direct CF group. It consisted of 14 participants. The initial number of participants in this group was 17 in week 1, but only 14 participants completed all the writing tasks. Out of the three participants who did not complete the study, one missed the first revision task, the second one missed writing session 3, and the third participant could not continue after second week due to illness. The incomplete data of these three participants was not included in this study.

Participants in this group received direct feedback (i.e., the errors were corrected by the researcher by crossing out the erroneous forms and providing the corresponding target forms above the errors). All existing linguistic errors (both grammatical and non-grammatical) were identified by the researcher (As it was indicated before, to analyse the accuracy in the present study, the errors were divided into two categories: grammatical and non-grammatical. Please see section 4.1 for a detailed description of the error

categories) and the corresponding target forms were provided above the errors, as illustrated in example 1 below:

Example 1: Direct CF

was drinking

1. One day, an Emu ~~drink~~ water in front of a house.

The thirsty

2. ^\ Emu was very ~~thusty~~.

Experimental group B: Underline+metalinguistic CF (Indirect feedback)

Experimental group B was an underline+metalinguistics CF group. There were initially 15 participants in this group, but one of them withdrew from the study in week 2. Therefore, that incomplete data was not included in this study. Thus, there were ultimately 14 participants in the Underlining+metalinguistic CF group as well. The indirect feedback for Group B consisted of underlining the errors, together with written metalinguistic explanation (information about the nature of errors). Similar to group A, participants in this group received feedback on all errors including both grammatical and non-grammatical errors. The errors were underlined and the metalinguistic information was provided above and below the errors, and in some cases on the margins, as illustrated in example 2:

Example 2: Underline+metalinguistic CF (Indirect feedback)

1. One day, an Emu drink water in front of a house.
2. △ Emu was very thusty.
- Wrong tense
- Need article
- Incorrect spelling
-

Experimental group C: Underline only CF (Indirect feedback)

Experimental group C was a underline only CF group. There were 13 participants in the underlining only CF group. Although 15 students participated in the writing task in week 1, two participants withdrew themselves from the study later. Participants in this group also received feedback on both grammatial and non-grammaticall errors but feedback for this group was in the form of underlining the errors only, as illustrated in example 3:

Example 3: Underlining only CF (Indirect feedback)

1. One day, an Emu drink water in front of a house.
2. Emu was very thusty.

Control group D: No CF

Group D was a control group. The participants in the control group did not receive any feedback on their errors. They were asked to self-correct their errors in the

three revision tasks. There were 12 participants in this group. This group started with 12 students in week 1 and all 12 participants completed all the writing tasks.

Notably, the integration and use of these three above mentioned feedback types as treatments for this current study assured that the CF types vary in terms of explicitness, i.e., from fully explicit to less explicit and implicit (Direct CF being fully explicit, Underline+metalinguistic CF being less explicit, and Underline only CF being the implicit).

3.4 Writing Tasks and Prompts

The writing tasks for the present study were writing four narratives from four picture prompts and the revisions of three of these written narratives (produced during the treatment sessions). Previous research (e.g., Truscott & Hsu, 2010, Van Beunigen et al., 2012) has also used similar tasks as prompts to elicit writing samples (i.e., research data). The pictures prompts were selected from ESL textbooks. Students composed one written version of a picture narrative in each writing sessions from four different picture prompts (i.e., each time a different picture was used to produce a new writing).

A pilot study was conducted in order to examine the feasibility of the four writing tasks (i.e., the picture prompts). Four intermediate level ESL students studying at the University of Victoria (UVic) language center volunteered to participate in the pilot study. The pilot study was conducted within a span of 4 weeks. Participants were asked to spend as much time as needed to write the narratives form the picture prompts. On an average, the picture prompts helped produce 100 words (as targeted) within a span of average 20-30 minutes. Participants were also allowed to take 15 minutes to look at or

review the corrections (i.e., the CF) and as much time as needed to do the revision tasks. On average the participants spent 7-10 minutes reviewing the correction and completed the revision tasks in 20-25 minutes. Based on these findings, the actual time to write and revise the narratives in the present study was kept to 30 minutes each, and participants were allowed to look at or review their errors for 10 minutes.

The picture prompts used for Writing 1 had a sequence of eight pictures. The pictures depicted the story of an Emu who fell in love with a man when he gave it food out of care, and how the man got rid of the Emu after some ordeals. This picture prompt (for Writing 1) was adapted from the book “Can You Believe it?” by Jann and Linda Huizenga (Unit 8; p. 50), published by Oxford University Press (2000). The picture prompts for Writing 2 included a sequence of 10 pictures, which showed the story about a bald man who was followed and hit by two individuals while walking on the street. The man finally reached a home but again was hit by a woman. This picture prompt (for Writing 2) was adapted from the book “Teaching Listening Comprehension” by Penny Ur (Figure 13; p. 88), published by Cambridge University Press (1984). According to the book’s acknowledgments page, the illustration was done by Maclachlan and originally appeared in Punch Magazine. The picture prompts for Writing 3 included 11 pictures. The pictures showed the story of three friends who planned a whole night out and how they spent their eventful night together. This picture prompt was adapted from a photocopiable on-line ESL book “New English File: Elementary Teacher’s Book”, written by Clive Oxenden, Christina Latham-Koenig, Paul Seligson, and Francesca target, (Unit 5-C, p. 203) published by Oxford University Press (2004). The picture prompt for the final writing (Writing 4) included 10 pictures. The pictures narrated the

story of a young man who was almost hit by the same car every time he was crossing a road, and finally, planned to teach the car driver a lesson. In terms of complexity, all the four picture prompts were similar. The picture prompt for Writing 4 was adapted from the book “Focus on Grammar: an intermediate course for reference and practice” (Vol. 2), by Marjorie Fuchs, Margaret Bonner and Miriam Westheimer, published by Longman (2000). Please see Appendix 6 for the four picture prompts.

3.5 Treatment Procedure

The present investigation included seven sessions: Writing 1, revision of Writing 1, Writing 2, revision of Writing 2, Writing 3, revision of Writing 3, and Writing 4 (delayed writing). All these seven sessions were completed within the span of six weeks: Writings 1, 2, and 3 and their revisions in week 1, 2, and in week 3, and production of Writing 4 in week 6 (two weeks after the last treatment in week 3). The stimulated recall interviews took place for all 3 treatment groups in week 6 (the last day) with selected participants. The writing tasks (picture prompts) and topics were introduced and explained by the researcher of the present study in all the writing sessions. During each writing task, the researcher provided each participant in all 4 groups with one picture prompt and one paper (lined paper, specially prepared for the writing and revision tasks with enough space between the lines). The participants were allowed to use either pen or pencil to write the narratives. The CF treatments were also provided by the researcher of the present study, and the all revision sessions were conducted by the same researcher as well. All CF were provided using red ink. All the writing and revision tasks took place at participants’ respective ESL schools after regular class hours.

In week one, participants in all four groups produced Writing 1. They were given 30 minutes for this writing task, and were instructed to write at least 10 lines in length or minimum 100 words. Once the participants finished Writing 1, the researcher collected those and provided feedback on all existing errors. The writings were returned to the participants the next day (on day 2). Participants in groups A, B and C only received the target feedback, i.e., Direct CF, Underline+metalinguistic CF and Underline only CF. Participants in group D (i.e., No CF group) did not receive any feedback. The feedback was provided the next day, as the task were relatively fresh in students' memories and believing that they might be more motivated to pay attention to the feedback provided. Participants were given ten minutes to look at the corrections and 30 minutes to revise the first draft of the Writing 1. They were asked to revise all the errors corrected by the researcher. To avoid students' revision by simply copying the corrections, the Direct CF group (group A) received corrections on photocopies of their original writings, which were taken away from them after ten minutes. They were provided with their original writings just immediately before starting their revision task. The participants of this group were also asked to produce minimum 10 sentences or 100 words in their writings. To ensure that there was learning outcome for No CF group as well, participants in the No CF group received an information session about 3 types of CF used as treatments in the current study once the writing and interview sessions were completed. Also, on the same day, the participants received CF on the photocopies of one of the writings they produced in the form of underlining, and the researcher explained the errors they made.

Production of Writing 2 and Writing 3 took place in weeks 2 and 3 respectively. The same procedure for writing and revision were followed with new picture prompts for

Writing 2 and Writing 3. Target CF (i.e., Direct CF, Underline+metalinguistic CF and Underline only CF) was provided on writings 2 and 3 and they were returned to the participants the next day (on day 2) for them to revise all the corrected errors. Similar to Week 1, participants were given ten minutes to look at the corrections and 30 minutes to revise their initial writings (2 and 3). They were instructed to revise all the errors indicated and to produce minimum 10 sentences or 100 words in their writings.

Participants in all 4 groups were required to produce one more new writing from a new picture prompt in week six. There was a two-week gap between treatments three and writing session four to measure delayed learning effect. Participants were given 30 minutes to produce the narrative (at least 10 lines in length or minimum 100 words).

Table 3.1 presents information on the length of students' writings in all sessions.

Table: 3.1 Length of students' writings (minimum and maximum no. of words)

Group	Writing 1	Writing 2	Writing 3	Writing 4
Direct CF	Min: 98 Max:149	Min: 79 Max:124	Min: 89 Max: 127	Min: 80 Max:138
Underline only	Min: 105 Max: 206	Min: 82 Max: 162	Min: 68 Max:165	Min: 70 Max:157
Underline+metalinguistic	Min: 70 Max:129	Min: 74 Max:145	Min: 83 Max:189	Min: 77 Max:171
No CF	Min: 69 Max:130	Min: 69 Max:170	Min: 95 Max:170	Min: 74 Max:186

Table 3.2 below presents an overview of the procedure described above.

Table 3.2 The treatment procedure

			Group A (Direct CF)	Group B (Underlining/ Metalinguistic CF)	Group C (Underlining only CF)	Group D (No CF)
Treatment	Week 1	Day 1	Writing 1	Writing 1	Writing 1	Writing 1
		Day 2	CF + Revision of Writing 1	CF + Revision of Writing 1	CF + Revision of Writing 1	Revision of Writing 1
	Week 2	Day 1	Writing 2 (on new picture)	Writing 2 (on new picture)	Writing 2 (on new picture)	Writing 2 (on new picture)
		Day 2	CF + Revision of Writing 2	CF + Revision of Writing 2	CF + Revision of Writing 2	Revision of Writing 2
	Week 3	Day 1	Writing 3 (on new picture)	Writing 3 (on new picture)	Writing 3 (on new picture)	Writing 3 (on new picture)
		Day 2	CF + Revision of Writing 3	CF + Revision of Writing 3	CF + Revision of Writing 3	Revision of Writing 3
	Week 6		Writing 4 (on new picture) + Recall interview	Writing 4 (on new picture) + Recall interview	Writing 4 (on new picture) + Recall interview	Writing 4 (on new picture) + Interview

3.6 Student Interviews

To investigate learners' perception and attitude on different types of feedback they received and to find out their opinions regarding the effectiveness of different CF types, 24 participants from three treatment groups (8 students from each group) were invited to participate in a prompted stimulated recall interview. As described in section 3.1 (Research Design), stimulated recall is a techniques used to collect learners' self-analysis or reflections about the learning process, in which learners are presented with a stimulus and are asked to report their thoughts following a language learning experience. The initial 24 participants were selected based on the number of errors they corrected, twelve (four from each group) of which were the ones that corrected most number of errors and the other twelve (four from each group) were the ones who corrected least number of

errors. All the selected participants were informed and invited by the researcher in week 3 (after their last treatment), but as participation in the interview was voluntary, nine of the initially selected participants (from all 3 groups) were not willing to participate. Then the researcher approached other participants in the three treatment groups and recruited nine other participants for the interview, and thus the total number of the participants participating in the stimulated recall interview ultimately became 24 (as planned initially).

A questionnaire was used during the stimulated recall interview. This recall interview questionnaire consisted of seven open ended questions (Please see Appendix 4 for the stimulated recall interview questionnaire, and section 3.6.1 for a discussion on the stimulated recall interview questionnaire). During the interview sessions, the researcher provided the selected students with both their original narratives they received feedback on and also the revised versions during the interview process. During the interview, the researcher showed the participants some of the randomly selected errors (both grammatical and non-grammatical types) they corrected and also some of the errors they did not or could not correct as prompts and asked them to comment on the reasons behind their responses to those errors. This process was used by the researcher to make sure that the prompts were accessible and “accurate memory structures are brought into focus and recalled” (Gass and Mackey, 2000, pg. 89). Students were also asked to indicate which error type (grammatical or non-grammatical) was easy or difficult for them to correct from the CF they received. They were also asked to express their opinions about the usefulness of the particular feedback they received. In addition, they were shown the other two CF types that were used in the present study as treatments in three other groups

and were asked to indicate which CF type out of these three (in compare to the CF they received and the other two types) would be useful for successful correction of errors in their opinion and why. Each interview session took 8-12 minutes on an average to complete. The interview sessions were recorded using a digital audio recorder and later transcribed for analysis.

To find out learners' opinions about the self-correction of errors and their perceptions about the effectiveness of different types of CF, participants of 'No CF' groups were also invited to participate in a structured informal interview. Participation in the interview was voluntary, and 10 out of 12 students participated in the interview. A separate questionnaire was used for this interview (please see Appendix 5 for the questionnaire and section 3.6.1 for a discussion on this interview questionnaire). In this informal and a brief individual interview, the participants were asked if self-correction was helpful and if it was an effective way to improve their writing, and what was the reason behind their opinion. They were also shown the 3 CF types that were used in the present study as treatments in three other groups and were asked to indicate which CF type would be useful for successful correction of errors in their opinion and why. The No CF group was also considered for an interview believing that findings from more participants' would provide a better and clear picture about their opinion regarding the usefulness or effectiveness of different CF types. Each interview session typically lasted 5-6 minutes.

3.6.1 Interview questionnaires

In order to design the interview questionnaires, the researcher of the present research studied books on stimulated recall interviews (e.g., Gass & Mackey, 2000; Merton, Fiske & Kendal, 1990) and also read literature that used stimulated recall interviews to investigate learners' perspectives and attitudes regarding CF (e.g., Watanabe & Swain, 2007; Bao, Egi & Han, 2011). The research objectives of the current study were also considered while designing the questionnaires.

The prompted stimulated recall interview questionnaire (Appendix 4) for the three treatment groups consisted of seven open ended questions. The interview was meant to be informal in nature and the first two questionnaire items were designed to help participants recall the reasons (or their thoughts) behind their corrections or non-corrections of different error types (both grammatical and non-grammatical). The rest of the five questions focused on eliciting participants' opinions regarding the usefulness of the target CF they received in their accuracy improvement and development of their writing skills as a whole.

The structured interview questionnaire for the 'No CF' group (Appendix 5) included three questions. Two of those were 'yes'/'no' questions with accompanying questions asking participants' reasons for their answers. The third question provided participants with three CF options with examples for them to select from as most useful, and also sought the reason for their selections. In both interviews (prompted stimulated recall with treatment groups and the one with No CF group), the interview questionnaires were introduced to the participants during the interviews.

3.7 Data Processing

To process the data, all hand written narratives were assigned a code number on the first day of data collection in order to keep the anonymity of the participants. Each week, during the production of the writings and their revisions, the same code number was used on the papers provided to the participants (for the production of narratives and the revisions tasks). During the audio recordings of the stimulated recall interview (with the treatment groups) and the interview with the control group, participants were identified with their code numbers.

All the writings and their revisions were collected by the researcher of the present study for marking and were kept in a safe locker at his home. The writings were corrected in red by the researcher of the present study immediately after the production (on the same day) to be returned to the participants for their revisions on the second day. The scores of all the writings and revisions were put and saved in a Microsoft Excel file on the researcher's personal computer for later analysis. A detailed account of the marking of errors, the accuracy measure, and the analysis used is presented in Chapter 4. The interview recordings and their transcriptions (done by the researcher) were saved in the same computer and the transcriptions of interview data were put in another Excel file for qualitative analysis (presented in section 5.1).

CHAPTER FOUR– DATA ANALYSIS AND RESULTS: QUANTITATIVE DATA

The chapter first describes the assessment measures, then explains how the data were analyzed, and finally presents the results, followed by a summary of the findings.

4.1 Assessment Measures

Every text was analyzed for writing accuracy. Like previous studies of the effectiveness of CF (e.g., Chandler, 2003, Truscott & Hsu, 2008, Van Beuningen et al., 2012), the present study used an error ratio to measure overall accuracy. The error ratio used to measure overall accuracy in this study is: the total number of errors divided by the total number of words written. The result was then multiplied by 100 (i.e., total number of errors/total number of words x 100). A 100-word ratio was used in order to interpret the total number of errors in terms of percentages, i.e., it provided error rates in students' narratives per 100 words.

One of the questions in this study was whether the effect of feedback depends on types of errors. For that purpose, when analysing the data, first the overall accuracy was measured. As was done in some of the previous studies exploring the effectiveness of written CF on grammatical and non-grammatical accuracy (e.g., Van Beuningen, 2011), the errors were then broken down into grammatical and non-grammatical errors and the accuracy rate in each subgroup was calculated and compared. Grammatical error (i.e., the errors in the syntax of a sentence) category included article/determiner errors, inflectional errors, omission of necessary element, addition of non-necessary element, number/gender errors, pronoun errors, preposition errors, incomplete sentence, and other grammatical errors. The non-grammatical category included word choice error,

capitalization error, spelling error, punctuation error and other non-grammatical errors (see Table 4.1).

Table 4.1 Error categories and types

Error Categories	Error Type
Grammatical	Article/determiner error
	Inflectional error
	Omission of necessary element
	Addition of non-necessary element
	Number/Gender error
	Pronoun errors
	Incomplete sentence
	Preposition errors
	Other grammatical error
Non-grammatical	Word Choice error
	Capitalization error
	Spelling error
	Punctuation error
	Other non-grammatical error

Similar to the measure of overall accuracy, for grammatical accuracy error ratios were used. To this end, a ratio was calculated on the basis of the sum of the number of article/determiner errors, inflectional errors, omission of necessary element, addition of non-necessary element, number/gender errors, pronoun errors, preposition errors, incomplete sentence, and other grammatical errors (i.e., (number of grammatical errors/total number of words) x 100). On the other hand, word choice error, capitalization error, spelling error, punctuation error and other non-grammatical errors were included in the non-grammatical accuracy ratio (i.e., (number of non-grammatical errors/total number of words) x 100). All the errors in participants' texts were marked using error codes by the researcher. The coding helped in counting each error category. Although the

researcher was able to classify almost all of the observed errors, some could not be fit in either of the specified error subcategories. These were brought together under “other grammatical errors” or “other non-grammatical errors”.

Intra-rater and inter-rater reliability were calculated to ensure consistency in the implementation of the assessment measures employed in the analysis of student writing. In order to check the reliability of scoring, 50% of the writings were graded a second time by the same researcher 6 months after the initial scoring and analysis of all data. Pearson correlation coefficients for the scores at two times for the four writing tasks were: 0.99, 0.99, 0.94, and 0.97 for Writing 1, Writing 2, Writing 3 and Writing 4 respectively. The Pearson correlation coefficients for the scores at two times for the three revision tasks were: 0.99, 0.99, and 0.99 for Revision 1, Revision 2, and Revision 3 respectively. To ensure good inter-rater reliability, another scorer, an ESL teacher and a native speaker of English, scored 20% of the writings individually. Pearson correlation coefficients for the two scores in the four writing tasks were: 0.98, 0.98, 0.86, and 0.92 for Writing 1, Writing 2, Writing 3 and Writing 4, respectively. The Pearson correlation coefficients for the two scores in the three revision tasks were: 0.99, 0.87, and 0.95 for Revision 1, Revision 2, and Revision 3 respectively.

4.2 Quantitative Analysis

Quantitative analysis was carried out to measure and compare the differential outcomes of feedback treatment. To examine the effect of CF on new writings, a comparison was made between the groups on their rates of accuracy gains from Writing 1 to Writing 2, Writing 2 to Writing 3, Writing 3 to Writing 4 (Delayed Writing). To

examine the effect of error feedback on students' subsequent revisions, a comparison was made between the four groups on their accuracy gains in the three revision tasks (please see the following section for a description of the calculation of gain scores). Data were input to IBM SPSS 19.0 software. Two-way Analysis of Variance (ANOVA) was used to find out within-subject and between-subject effects on the different dependent variables (i.e. overall accuracy, grammatical accuracy, and non-grammatical accuracy) in the treatment and revision sessions (i.e., Writing 1, Writing 2, and Writing 3 and their revisions) as well as the delayed writing session (Writing 4). As the present study investigates the effects of more than one independent variables (1. CF treatments, i.e., Direct CF, Underline only, and Underline+metalinguistic CF; and 2. Tasks/revisions), the two-way ANOVA was used. A two-way ANOVA is considered to be effective in examining the influence of more than one independent variable on one dependent variable (i.e., in the case of the present study: overall accuracy, grammatical and non-grammatical accuracy). The two-way ANOVA also helps not only to determine the main effect of each independent variable but also helps find out if there is an interaction between the independent variables. The two-way ANOVA model contained treatment as a between-subject variable. One-way ANOVAs were then conducted to determine whether there were any significant differences between the mean error rates in the writing tasks and in their revisions of the four groups. Before ANOVAs were conducted, the assumptions of Homogeneity of Variance and Normality of Distribution were checked by using Levene's test and Shapiro-Wilk test. The results were not significant, and thus, the data met the assumptions.

4.3 Results

This section presents the findings regarding the effectiveness of CF on written accuracy. It first presents the results of the effects of feedback on students' revision. It then reports those about the effects of CF on new pieces of writing. In each analysis the effectiveness of CF will be analyzed for both grammatical and non-grammatical errors.

In order to find out if the students in the four groups began the study with similar writing proficiency, first a one-way ANOVA was performed on the error rates for Writing 1. These results showed that proficiency wise, the four groups were not similar. The difference between the means of error rates for the experimental groups and that for the control group was significant [$F(3, 49) = 3.89, p = .014$]. This indicated that there were insignificant initial differences between groups in overall accuracy. Grammatical error rates between groups was also significantly different ($p = .043$), but the error rate difference between the groups in non-grammatical errors was not significant ($p = .101$).

The descriptive statistics for error rates of all the 4 groups in Writing 1 (Session 1) are presented in Table 4.2.

Table: 4.2 Descriptive statistics: Error rate^a of 4 groups in Writing 1 (Session 1)

Groups	Error rates in Writing 1 (Session 1)	
	<i>M</i>	S.D.
1. Underline+metalinguistic (N=14)	17.97	6.20
2. NoCF (N=12)	20.65	4.85
3. DirCF (N=14)	28.53	10.48
4. Underline only (N=13)	23.14	10.58
Total (N=53)	22.64	9.17

^a In percentage (Total no. of errors/total no. of words x 100)

The ANOVA results are displayed below in Table 4.3.

Table 4.3 One-way ANOVA for error rates: Writing 1

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	842.909	3	280.970	3.897	.014
Within Groups	3532.883	49	72.100		
Total	4375.791	52			

Post hoc test with Bonferroni revealed that there was a significant difference in error rates between Direct CF ($M = 28.53$, $SD = 10.48$) and Underline+metalinguistic group ($M = 17.97$, $SD = 6.20$). Since there was a significant difference between the means of error rates of two groups, instead of using raw scores in each writings, gain scores were calculated. Gain scores were calculated for both writings (i.e., in new writings) and in their revisions in order to obtain the gains or improvements in accuracy. Gain scores in writings were obtained by deducting the mean error rates of an initial writing from the subsequent writing, and the gain scores in revisions were obtained by deducting the mean error rates of the writings from their revisions. In particular, accuracy gains in writings were calculated by using these formulas:

$$\text{Accuracy gain in Writing 2} = \text{Total error rate in Writing 1} - \text{Total error rate in Writing 2}$$

$$\text{Accuracy gain in Writing 3} = \text{Total error rate in Writing 2} - \text{Total error rate in Writing 3}$$

$$\text{Accuracy gain in Delayed Writing (Writing 4)} = \text{Total error rate in Writing 3} - \text{Total error rate in Delayed Writing}$$

On the other hand, accuracy gains in revisions were calculated by using the following formulas:

Accuracy gain in Revision 1 = Total error rate in Writing 1 – Total error rate in Revision 1

Accuracy gain in Revision 2 = Total error rate in Writing 2 – Total error rate in Revision 2

Accuracy gain in Revision 3 = Total error rate in Writing 3 – Total error rate in Revision 3

In this manner, a positive gain score indicates higher accuracy gain (making less errors) in subsequent narrative(s), and a negative gain score indicates lower accuracy gains (making more errors) in subsequent narrative(s).

4.3.1 Revision effects

As mentioned earlier, in order to examine the effects of feedback on revisions, first a two way ANOVA was used to test within and between-group differences in the writing and revision sessions. In case of the revision accuracy, the two-way ANOVA demonstrated that time had a significant effect. That is, there was an improvement from Revision 1 to Revision 2, Revision 2 to Revision 3 irrespective of the types of CF [$F(2, 98) = 6.09; p = .003$]. The two-way ANOVA also showed that condition (i.e. feedback types) also had a significant effect on the revisions [$F(3, 49) = .000; p = .000$]. However, the test of within-subject effects demonstrated that there was no interaction between time and condition [$F(6, 98) = 1.62; p = .148$], which displays that learners' improvement in revision accuracy over time did not depend on the feedback condition. One-way ANOVA tests were conducted individually for each condition to find out where the effect of time and condition was. Detailed results for both revision accuracy and transfer effects of CF on new pieces of writing are presented in the following section.

4.3.1.1 Revision effects of CF on overall written accuracy

As mentioned in section 4.1 that in the present study, the overall accuracy measure was broken down into a measure of grammatical accuracy and a measure of non-grammatical accuracy. This section reports first the results of overall accuracy gains in the three revisions. The results of grammatical and non-grammatical accuracy gains in the three revisions will be presented in the next section (i.e., section 4.3.1.2).

In order to examine the effect of CF on students' subsequent revisions, a comparison was made between the four groups on their accuracy gains from Writing 1, 2 and 3 to their revisions using a one-way ANOVA test. Table 4.4 provides the descriptive statistics for accuracy gains in Revision 1, Revision 2 and Revision 3, itemized by group.

Table 4.4 Descriptive statistics: Overall accuracy gains in revision 1, 2 & 3 by group

Groups	Accuracy Gain: Revision 1		Accuracy Gain: Revision 2		Accuracy Gain: Revision 3	
	<i>M</i>	S.D.	<i>M</i>	S.D.	<i>M</i>	S.D.
1. Underline+metalinguistic (N=14)	12.04	6.78	11.85	5.51	8.30	4.82
2. NoCF (N=12)	5.61	5.12	3.47	1.88	2.31	1.70
3. DirCF (N=14)	22.20	8.43	14.44	5.82	17.20	10.86
4. Underline only (N=13)	13.34	8.16	12.19	5.17	11.72	7.02
Total (N=53)	13.59	9.25	10.72	6.30	10.13	8.74

The ANOVA results are shown in Table 4.5.

Table 4.5 One-way ANOVA for accuracy gains: Writing 1, 2 & 3 to their revisions

		Sum of Squares	df	Mean Square	F	Sig.
Accuracy gain in Revision 1	Between Groups	1836.586	3	612.195	11.479	.000
	Within Groups	2613.181	49	53.330		
	Total	4449.767	52			
Accuracy gain in Revision 2	Between Groups	869.250	3	289.750	11.867	.000
	Within Groups	1196.380	49	24.416		
	Total	2065.630	52			
Accuracy gain in Revision 3	Between Groups	1512.799	3	504.266	10.041	.000
	Within Groups	2460.762	49	50.220		
	Total	3973.561	52			

As presented in the table 4.5, the one-way ANOVA of the error rates revealed that the difference in error reduction between the groups in all 3 revision tasks is highly significant (in revision 1: $F(3, 49) = 11.47, p < .001$; in Revision 2: $F(3, 49) = 11.86, p < .001$; in Revision 3: $F(3, 49) = 10.04, p < .001$).

In order to determine where the significant differences in error rate reduction lay between groups, post-hoc multiple comparison tests were conducted using Bonferroni adjustments. The most important observation was that students were able to utilize the CF received during the revision tasks, and also that all three CF treatments turned out to be significantly more beneficial than the control treatment in all the three revision tasks.

Revision 1

Post hoc test with Bonferroni revealed that there was a significant difference in error rates between Direct CF ($M = 22.20, SD = 8.43$) and Underline+metalinguistic group ($M = 12.04, SD = 6.78$), Direct CF and No CF group ($M = 5.61, SD = 5.12$), and also between Direct CF and Underline only group ($M = 13.34, SD = 8.16$) in Revision 1.

Direct CF Group outperformed rest of the two treatment groups as well as the control group in Revision 1. Mean difference values indicated that out of the two indirect CF groups, Underline only group performed better than Underline+metalinguistic CF group but the difference in error rates was not significant. No CF group proved to be least beneficial in comparison to the three treatment groups.

Revision 2

As found from the Bonferroni test, in Revision 2 as well, students who did not receive any CF (No CF group) did not perform well. There was a highly significant difference in error rates between Direct CF ($M = 14.44$, $SD = 5.82$) and No CF group ($M = 3.47$, $SD = 1.88$), Underline only ($M = 12.19$, $SD = 5.17$) and No CF group, and also between Underline+metalinguistic ($M = 11.85$, $SD = 5.51$) and No CF group. Thus, all three treatment groups- Direct CF, Underline+metalinguistic, and Underline only outperformed No CF group in Revision 2, i.e., CF treatments turned out to be significantly more beneficial than the control treatment. Mean difference values indicated that students who received Direct CF performed better than students in the rest of the two treatment groups, and among the two indirect CF groups, students in the Underline only group performed slightly better than the Underline+metalinguistic CF group. The difference in error rates in all three treatment groups was not significant.

Revision 3

Bonferroni test revealed that in Revision 3, there was a significant difference in error rates between Direct CF ($M = 17.20$, $SD = 10.86$) and Underline+metalinguistic CF group ($M = 8.30$, $SD = 4.82$) as well as Direct CF and No CF group ($M = 2.31$, $SD =$

1.70). A significant difference in error reduction was also evident between Underline only CF group ($M = 11.72$, $SD = 7.02$) and No CF group. Students who received Direct CF outperformed students who did not receive any CF (control group) as well as students who received Underline+metalinguistic CF. Students who received Underline only CF also outperformed those in the control group. The mean difference values indicated that effect of Direct CF was larger than two indirect CF treatments. Out of the two indirect CF treatments, Underline only CF was slightly more beneficial than Underline+metalinguistic CF in Revision 3.

4.3.1.2 Revision effects of CF on grammatical and non-grammatical accuracy

The two-way ANOVA test confirmed that time and condition had significant effects on grammatical and non-grammatical accuracy improvement in all three revisions. The test further demonstrated that type of errors also had an effect [$F(1, 49) = 13.28$; $p = .001$]. However, type of errors and condition (i.e., feedback types) did not have any interaction [$F(3, 49) = 2.20$; $p = .099$]. In general, CF seemed to be more effective on grammar errors than non-grammatical errors (see the one-way ANOVA results below for details).

4.3.1.2.1 Revision effects on grammatical accuracy

In order to examine the effect of CF on grammatical accuracy in students' subsequent revisions, a comparison was made between the four groups on their reduction in grammatical error rates from Writings 1, 2 and 3 to their revisions. The results are shown in Table 4.6.

Table 4.6 One-way ANOVA for grammatical accuracy gains: Writings 1, 2 & 3 to their revisions

		Sum of Squares	df	Mean Square	F	Sig.
Grammatical accuracy gain in Revision 1	Between Groups	890.953	3	296.984	8.908	.000
	Within Groups	1633.640	49	33.340		
	Total	2524.593	52			
Grammatical accuracy gain in Revision 2	Between Groups	305.677	3	101.892	6.762	.001
	Within Groups	738.301	49	15.067		
	Total	1043.978	52			
Grammatical accuracy gain in Revision 3	Between Groups	594.980	3	198.327	7.451	.000
	Within Groups	1304.176	49	26.616		
	Total	1899.156	52			

The one-way ANOVA revealed that the CF treatment on Writings 1, 2 and 3 had a highly significant effect on students grammatical accuracy in all the three revisions (in Revision 1: $F(3, 49) = 8.90, p = .000$; in Revision 2: $F(3, 49) = 6.76, p = .001$; in Revision 3: $F(3, 49) = 7.45, p = .000$). In order to determine where the significant differences in grammatical error rate reduction lay between groups, post-hoc multiple comparisons was conducted using Bonferroni test.

The outcomes of post-hoc comparisons with Bonferroni test for grammatical errors in Revision 1 displayed that CF enabled students to correct their grammatical errors when revising their Writing 1. The difference in error reduction rate between Direct CF group and the rest of the three groups was highly significant. Students who received Direct CF ($M = 13.98, SD = 6.20$) outperformed students in rest of the two CF treatment groups: Underline+metalinguistic CF group ($M = 6.89, SD = 4.10$), Underline only CF group ($M = 7.44, SD = 7.21$), as well as students in the No CF group ($M = 2.46, SD = 5.12$). There was no significant difference in error rate reduction between No CF

group and Underline only CF and Underline+metalinguistic CF group. In Revision 2 there was a significant difference in mean grammatical error rates between the three treatment groups and the control group. Students in Direct CF ($M = 8.55$, $SD = 4.75$) outperformed No CF group ($M = 2.23$, $SD = 2.29$). Students in Underline+metalinguistic CF ($M = 7.79$, $SD = 4.22$) and Underline only CF ($M = 7.12$, $SD = 3.58$) outperformed No CF group as well. All three treatment groups (both direct and indirect) had highly beneficial effects on grammatical accuracy measure in Revision 2. In Revision 3 there was a significant difference in grammatical error rates between Direct CF ($M = 10.72$, $SD = 7.43$) and Underline+metalinguistic CF ($M = 5.07$, $SD = 4.72$) and also between Direct CF group and No CF group ($M = 1.26$, $SD = 1.59$). Students who received Direct CF outperformed students in both No CF and Underline+metalinguistic CF groups. Direct CF students also corrected more grammatical errors than students in Underline only CF group but the difference in mean error rates between them was not significant. Underline only CF and Underline+metalinguistics CF groups did not have significant difference in grammatical accuracy gain with No CF groups. Thus, only Direct CF had highly beneficial effect on grammatical accuracy measure in Revision 3.

4.3.1.2.2 Revision effects on non-grammatical accuracy

In order to examine the effect of CF on non-grammatical accuracy in students' subsequent revisions, a comparison was made between the four groups in revisions of their non-grammatical errors. The results are shown in Table 4.7.

Table 4.7 One-way ANOVA for non-grammatical accuracy gains: Writing 1, 2 & 3 to their revisions

		Sum of Squares	df	Mean Square	F	Sig.
Non-grammatical accuracy gain in Revision 1	Between Groups	171.177	3	57.059	2.412	.078
	Within Groups	1159.174	49	23.657		
	Total	1330.351	52			
Non-grammatical accuracy gain in Revision 2	Between Groups	154.758	3	51.586	4.373	.008
	Within Groups	577.978	49	11.795		
	Total	732.735	52			
Non-grammatical accuracy gain in Revision 3	Between Groups	224.073	3	74.691	6.420	.001
	Within Groups	570.070	49	11.634		
	Total	794.143	52			

The one-way ANOVA revealed that the CF treatment had significant effects on non-grammatical errors in students' revision of Writing 2 [$F(3, 49) = 4.37, p = .008$] and Writing 3 [$F(3, 49) = 6.42, p = .001$]. CF treatments in Writing 1 did not result in any significant influence in non-grammatical error reduction [$F(3, 49) = 2.41, p = .078$]. In order to determine where the significant differences in non-grammatical error rate reduction lay between groups, post-hoc multiple comparisons was conducted using Bonferroni test.

The outcomes of post-hoc comparisons with Bonferroni test for non-grammatical errors showed that none of the CF treatments were successful in improving students' non-grammatical accuracy in Revision 1. All the three treatment groups performed better than No CF group in Revision 1. In Revision 2, Bonferroni test displayed a significant difference in non-grammatical error rates between Direct CF group ($M = 5.88, SD = 4.83$) and No CF group ($M = 1.24, SD = 2.59$) and between Underline only CF ($M = 5.06, SD = 3.27$) and No CF group. Students in both Direct CF and Underline

only CF groups outperformed students who did not receive any CF (No CF group), i.e., both of these CF treatments were more effective in improving students' non-grammatical accuracy than No CF treatment. In Revision 3 also, both Direct CF treatment and Underline only CF treatment were more effective in improving students' non-grammatical accuracy than No CF treatment. The difference in non-grammatical error rates between Direct CF group ($M = 6.47$, $SD = 4.71$) and No CF group ($M = 1.04$, $SD = 1.92$) and between Underline only CF ($M = 5.42$, $SD = 3.56$) and No CF group was significant. In compare to No CF treatment, Underline+metalinguistic CF treatment was not successful in improving students' non-grammatical accuracy.

4.3.2 Transfer effects

This section first reports the results related to the transfer effects of feedback on new pieces of writings. The analysis examines both short-term (from Writing 1 to 2, and from Writing 2 to 3) and long-term transfer effects (from Writing 3 to the delayed Writing 4) on overall accuracy and also on the grammatical and non-grammatical accuracy.

As mentioned earlier, in order to examine the effects of CF on new writings, first a two-way ANOVA was used to test within and between-group differences in the writing sessions. The test demonstrated that time did not have any significant effect (i.e., there was no improvement from Writing 1 to Writing 2, Writing 2 to Writing 3, and Writing 3 to Delayed Writing) irrespective of the types of CF [$F(2, 98) = 2.08$; $p = .130$]. There was no main effect of conditions either [$F(3, 49) = 1.73$; $p = .173$]. However, there was an interaction of time and condition (i.e., feedback types) [$F(6, 98) = 2.50$; $p = .027$].

This shows that learners were more likely to improve overtime depending on the feedback condition. Since there was an interaction between time and condition, one-way ANOVAs were conducted individually to find out where the effect was (see below).

4.3.2.1 Short-term transfer effects

This section reports the findings regarding the short-term transfer effects on overall accuracy as well as on grammatical and non-grammatical accuracy in turn.

4.3.2.1.1 Short-term transfer effects on overall accuracy

In order to examine the short-term learning effects of CF treatments (from Writing 1 to Writing 2 and from Writing 2 to Writing 3), a comparison was made between the means of overall accuracy gain scores in four groups by using a one-way ANOVA. Table 4.8 displays the descriptive statistics for overall accuracy gain scores for all groups, itemized per session.

Table 4.8 Descriptive statistics: Short-term overall accuracy gains by group and session

Groups	Accuracy Gain: Writing 1 to Writing 2		Accuracy Gain: Writing 2 to Writing 3	
	<i>M</i>	<i>S.D.</i>	<i>M</i>	<i>S.D.</i>
1. Underline+metalinguistic (N=14)	1.66	7.77	5.21	7.11
2. NoCF (N=12)	4.36	10.14	3.47	3.83
3. DirCF (N=14)	10.88	8.46	-2.82	7.25
4. Underline only (N=13)	4.87	11.11	1.30	9.08
Total (N=53)	5.50	9.77	1.73	7.58

ANOVA results are shown in Table 4.9.

Table 4.9 One-way ANOVA for short-term accuracy gain:
Writing 1 to 2 and Writing 2 to 3

		Sum of Squares	df	Mean Square	F	Sig.
Accuracy Gain: Writing 1 to Writing 2	Between Groups	632.619	3	210.873	2.384	.081
	Within Groups	4333.507	49	88.439		
	Total	4966.126	52			
Accuracy Gain: Writing 2 to Writing 3	Between Groups	498.916	3	166.305	3.266	.029
	Within Groups	2494.922	49	50.917		
	Total	2993.839	52			

The one-way ANOVA showed that the four groups did not vary in the accuracy gains in the Writing 2 [$F(3, 49) = 2.38, p = .081$]. On the other hand, the accuracy gain scores significantly varied in the four groups in Writing 3 [$F(3, 49) = 3.26, p = .029$]. In order to determine where the significant differences in accuracy gains lay between groups, post-hoc multiple comparison tests were conducted using Bonferroni tests.

In case of the overall accuracy gain from Writing 1 to Writing 2, post hoc test with Bonferroni revealed that in Writing 2 there was no significant difference in accuracy gains between the groups that received CF and that of the control group. In case of the three CF treatment groups, the differences in mean scores indicated that students who received Direct CF performed better than students who received Underline+ meta-linguistic CF, however the difference in accuracy gain scores for this two groups was not significant. Students in Underline only CF reduced more errors than students in Underline+metalinguistic group in Writing 2. Comparison of means between Direct CF group and No CF group, as well as between Underline only CF and No CF group further demonstrated that the treatment groups and No CF group performed almost similar in

terms of accuracy gain in Writing 2. Thus, CF treatment on Writing 1 did not have any short-term transfer effects on a new writing task a week later (on Writing 2).

With regard to the overall accuracy gain from Writing 2 to Writing 3, post-hoc pairwise comparison using Bonferonni test revealed a significant difference in mean accuracy gains between Underline+metalinguistic CF ($M = 5.21, SD = 7.11$) and Direct CF ($M = -2.82, SD = 7.25$). In other words, students who received Underline+metalinguistic CF outperformed students who received Direct CF. Underline+metalinguistic CF group also performed slightly better than Underline only CF group. There were no significant differences in accuracy gains between other groups. One important observation in terms of performance in Writing 3 is that students who did not receive any CF (control group) performed better than students who received Direct CF and Underline only CF. Thus, only Underline+metalinguistic CF on Writing 2 had short-term transfer effects on a new writing task one week later (on Writing 3).

4.3.2.1.2 Short-term transfer effects on grammatical accuracy

As mentioned earlier, the two-way ANOVA confirmed that time and condition (i.e., CF types) did not have any significant short-term and delayed effects on grammatical and non-grammatical accuracy improvement. However, the test revealed that type of errors had a significant effect [$F(1, 49) = 6.86, p = .012$]. In general, CF seemed to be more effective on grammar errors than non-grammatical errors (see the one-way ANOVA results below for details). The test also displayed that type of errors and condition did not have any interaction [$F(3, 49) = 2.47, p = .072$], which means that improvement of accuracy did not depend on feedback conditions.

In order to examine the short-term effects of CF treatments on grammatical accuracy (from Writing 1 to Writing 2 and from Writing 2 to Writing 3), a comparison was made between the means of grammatical accuracy gain scores in four groups by using a one-way ANOVA. Table 4.10 presents the descriptive statistics for grammatical accuracy gains, itemized by group and session.

Table 4.10 Descriptive statistics: Short-term grammatical accuracy gains by group and session

Groups	Accuracy Gain: Writing 1 to Writing 2		Accuracy Gain: Writing 2 to Writing 3	
	<i>M</i>	S.D.	<i>M</i>	S.D.
1. Underline+metalinguistic (N=14)	.908	4.12	3.19	4.62
2. NoCF (N=12)	2.83	7.14	1.20	3.37
3. DirCF (N=14)	7.49	6.53	-2.52	7.97
4. Underline only (N=13)	3.48	6.63	-.015	6.38
Total (N=53)	3.71	6.48	446	6.13

As presented in Table 4.11 below, the one-way ANOVA revealed that the four groups significantly varied in the grammatical accuracy gains in the Writing 2 [$F(3, 49) = 2.80, p = .049$]. On the other hand, there was no significant difference in grammatical accuracy gain scores between the four groups in Writing 3 [$F(3, 49) = 2.27, p = .092$].

Table 4.11 One-way ANOVA for short-term grammatical accuracy gain: Writing 1 to 2 and Writing 2 to 3

		Sum of Squares	df	Mean Square	F	Sig.
Grammatical accuracy gain: Writing 1 to Writing 2	Between Groups	320.329	3	106.776	2.804	.049
	Within Groups	1865.943	49	38.080		
	Total	2186.272	52			
Grammatical accuracy gain: Writing 2 to Writing 3	Between Groups	239.439	3	79.813	2.274	.092
	Within Groups	1719.704	49	35.096		
	Total	1959.143	52			

Post-hoc multiple comparisons were conducted using Bonferroni, in order to determine where the significant differences in the grammatical accuracy gains lay between groups. In case of grammatical accuracy gain from Writing 1 to Writing 2, the test revealed that students who received Direct CF ($M = 7.49$, $SD = 6.53$) outperformed students who received Underline+metalinguistic CF ($M = .908$, $SD = 4.12$) in grammatical accuracy gains in Writing 2. Like Underline+metalinguistic CF treatment, Underline only and No CF treatments did not have any significant influence on the reduction of grammatical errors in Writing 2. In brief, Direct CF was more effective on grammatical accuracy gain than those of indirect CF in Writing 2.

Bonferroni test in the case of grammatical accuracy gain from Writing 2 to Writing 3 revealed that there was no significant difference in accuracy gains between the groups. Comparison of the mean values of accuracy gains revealed that Underline+metalinguistic CF and No CF groups made fewer errors in Writing 3, but the difference between mean error rates was not significant. In brief, CF treatments did not have any significant short-term influence on grammatical accuracy improvement from Writing 2 to Writing 3.

4.3.2.1.3 Short-term effects on non-grammatical accuracy

In order to examine the short-term effects of CF treatments on non-grammatical accuracy (from Writing 1 to Writing 2 and from Writing 2 to Writing 3), a comparison was made between the means of non-grammatical accuracy gain scores in four groups by using a one-way ANOVA test. Table 4.12 presents the descriptive statistics for grammatical accuracy gains, itemized by group and session.

Table 4.12 Descriptive statistics: Short-term non-grammatical accuracy gains by group and session

Groups	Accuracy Gain: Writing 1 to Writing 2		Accuracy Gain: Writing 2 to Writing 3	
	<i>M</i>	S.D.	<i>M</i>	S.D.
1. Underline+metalinguistic (N=14)	.761	6.26	2.01	4.11
2. NoFB (N=12)	1.53	5.70	2.26	3.98
3. DirFB (N=14)	3.39	4.74	-.293	4.50
4. Underline only (N=13)	1.38	7.87	1.31	5.87
Total (N=53)	1.78	6.13	1.29	4.65

As determined by the one-way ANOVA, there was no significant difference in mean non-grammatical accuracy gains from Writing 1 to Writing 2 and from Writing 2 to Writing 3 between four groups. Results are presented in table 4.13.

Table 4.13 One-way ANOVA for short-term non-grammatical accuracy gain: Writing 1 to 2 and Writing 2 to 3

		Sum of Squares	df	Mean Square	F	Sig.
Non-grammatical accuracy gain: Writing 1 to Writing 2	Between Groups	53.772	3	17.924	.461	.711
	Within Groups	1905.344	49	38.885		
	Total	1959.116	52			
Non-grammatical accuracy gain: Writing 2 to Writing 3	Between Groups	54.049	3	18.016	.823	.487
	Within Groups	1072.278	49	21.883		
	Total	1126.327	52			

Post-hoc pairwise comparison test using Bonferroni was performed to find out if there was any significant difference. While comparing the mean of gain scores from Writing 1 to Writing 2, the test revealed that there was no statistically significant difference in non-grammatical accuracy gains between the control group and the CF treatment groups. In other words, students whose non-grammatical errors were corrected one week before writing a new text (in Week 2), did not benefit from CF treatments they received. In the case of non-grammatical accuracy gain from Writing 2 to Writing 3, the Bonferroni test also displayed no statistically significant difference between the control group and the CF treatment groups. In short, CF treatments did not have any significant short-term transfer effects (from Week 1 to 2 and from Week 2 to Week 3) on students' non-grammatical accuracy.

4.3.2.2 Delayed transfer effects

As mentioned earlier, the two-way ANOVA demonstrated that time did not have any significant effect (i.e., there was no improvement from Writing 1 to Writing 2, Writing 2 to Writing 3, and Writing 3 to Writing 4) irrespective of the types of FB, and

there was no main effect of conditions either. However, there was an interaction of time and condition (i.e., feedback types) [$F(6, 98) = 2.50$; $p = .027$]. Since there was an interaction between time and condition, one-way ANOVAs were conducted individually to find out where the effect was. The results are presented below.

4.3.2.2.1 Delayed transfer effects on overall accuracy

In order to examine the long-term transfer effects of CF treatments, a comparison was made between the means of accuracy gain scores (Gain scores from: Writing 3 to Delayed writing (Writing 4)) in all the four groups by using a one-way ANOVA. Table 4.14 displays the descriptive statistics for delayed overall accuracy gains for all four groups.

Table 4.14 Descriptive statistics: delayed overall accuracy gains by group and session

Groups	Accuracy Gain: Writing 3 to Writing 4 (Delayed)	
	<i>M</i>	<i>S.D.</i>
1. Underline+metalinguistic (N=14)	1.77	5.61
2. NoCF (N=12)	2.16	5.09
3. DirCF (N=14)	7.66	11.60
4. Underline only (N=13)	5.22	6.67
Total (N=53)	4.26	7.95

The ANOVA results are shown in Table 4.15.

Table 4.15 One-way ANOVA for delayed overall accuracy gain: Writing 3 to Delayed Writing

		Sum of Squares	df	Mean Square	F	Sig.
Accuracy Gain: Writing 3 to Delayed writing (Writing 4)	Between Groups	313.569	3	104.523	1.719	.175
	Within Groups	2979.836	49	60.813		
	Total	3293.404	52			

According to the one-way ANOVA, difference in means of accuracy gain scores from Writing 3 to Delayed writing (Writing 4) between four groups was not significant [$F(3, 49) = 1.719, p = .175$]. Comparison of means of accuracy gain scores between Writing 1 to Delayed writing also revealed no significant difference among the four groups [$F(3, 49) = 1.719, p = .175$]. Results are shown in Table 4.16.

Table 4.16 One-way ANOVA for delayed accuracy gain: Writing 1 to Delayed Writing

		Sum of Squares	df	Mean Square	F	Sig.
Accuracy Gain: Writing 1 to Delayed writing (Writing 4)	Between Groups	390.984	3	130.328	1.732	.173
	Within Groups	3687.088	49	75.247		
	Total	4078.072	52			

Post-hoc pairwise comparison using Bonferroni test revealed that there was no significant improvement in accuracy in the delayed writing two weeks after receiving the CF treatments on Writing 3. In other words, students whose errors were corrected in Week 3 did not benefit from CF they received. In comparison to the three CF treatments, students who received Direct CF made fewer errors than students in the Underline only CF and Underline+metalinguistic CF group in the Delayed writing (in Week 6), but the difference in the mean scores of accuracy gain of these groups was not significant.

Students in the No CF group were able to correct more errors than students who received Underline+metalinguistic CF.

In comparison to Writing 1 (Week 1) and Delayed writing (Week 6), the mean values of accuracy gain scores was almost identical. Post-hoc pairwise comparison using Bonferroni revealed that students who received Direct CF were able to utilize the CF better than students who received Underline only CF and Underline+metalinguistic CF, but the differences in mean scores was not significant. Students in the No CF group were able to correct more errors than students who received Underline+metalinguistic CF. In other words, there were no durable or long term transfer effects of CF treatments in this study.

4.3.2.2.2 Delayed transfer effects on grammatical accuracy

As mentioned earlier, the two-way ANOVA confirmed that time and condition (i.e., CF types) did not have any significant long-term effects on grammatical and non-grammatical accuracy improvement. Only type of error had a significant effect [$F(1, 49) = 6.86, p = .012$] and, in general, CF seemed to have more effect on grammar errors than non-grammatical errors. One-way ANOVA tests were conducted individually to find out where the effect was.

The one-way ANOVA demonstrated that there was no significant difference in mean scores of grammatical accuracy gains from Writing 3 (Week 3) to Delayed writing (Week 6) between four groups. Table 4.17 displays the descriptive statistics for long-term grammatical accuracy gains for all four groups.

Table 4.17 Descriptive statistics: Delayed grammatical accuracy gains by group and session

Groups	Accuracy Gain: Writing 3 to Writing 4 (Delayed)	
	<i>M</i>	S.D.
1. Underline+metalinguistic (N=14)	1.53	4.16
2. NoCF (N=12)	.030	4.51
3. DirCF (N=14)	5.70	7.98
4. Underline only (N=13)	4.32	5.96
Total (N=53)	2.98	6.14

The ANOVA results are presented in Tables 4.18.

Table 4.18 One-way ANOVA for delayed grammatical accuracy gain: Writing 3 to Delayed Writing (Writing 4)

		Sum of Squares	df	Mean Square	F	Sig.
Grammatical accuracy gain: Writing 3 to Delayed writing (Writing 4)	Between Groups	260.880	3	86.960	2.499	.070
	Within Groups	1705.014	49	34.796		
	Total	1965.893	52			

Post-hoc pairwise comparison test using Bonferroni also did not reveal any significant difference in grammatical accuracy gains between the three treatment groups as well as between the treatment groups and the control group. The results indicate that the CF treatments in week 3 were not beneficial for students' grammatical error reduction in a new narrative they wrote after two weeks (on Week 6).

While comparing Writing 1 (week 1) and Delayed writing (Week 6), the one-way ANOVA also did not reveal any significant difference in mean scores of accuracy gains

between the four groups. Post-hoc pairwise comparison also did not reveal any significant difference in grammatical accuracy gains from Writing 1 to the Delayed writing between the three treatment groups as well as between the treatment groups and the control group.

4.3.2.2.3 Delayed effects on non-grammatical accuracy

The one-way ANOVA revealed that, there was no significant difference in non-grammatical accuracy gains from Writing 3 (Week 3) to Delayed writing (Week 6) between four groups. The descriptive statistics for delayed grammatical accuracy gains for all four groups are presented in table 4.19.

Table 4.19 Descriptive statistics: Delayed non-grammatical accuracy gains by group and Session

Groups	Accuracy Gain: Writing 3 to Writing 4 (Delayed)	
	<i>M</i>	S.D.
1. Underline+metalinguistic (N=14)	.242	3.32
2. NoFB (N=12)	2.13	3.39
3. DirFB (N=14)	1.96	5.07
4. Underline only (N=13)	.896	3.60
Total (N=53)	1.28	3.90

The ANOVA results are presented in Tables 4.20.

Table 4.20 One-way ANOVA for delayed non-grammatical accuracy gain: Writing 3 to Delayed Writing (Writing 4)

		Sum of		Mean		
		Squares	df	Square	F	Sig.
Non-grammatical accuracy gain: Writing 3 to Delayed writing (Writing 4)	Between Groups	32.329	3	10.776	.693	.561
	Within Groups	762.039	49	15.552		
	Total	794.367	52			

Post-hoc pairwise comparison test using Bonferroni also did not reveal any significant difference in non-grammatical accuracy gains between the three treatment groups as well as between the treatment groups and the control group. The results indicate that students who received CF treatments on their non-grammatical errors two weeks before (on Week 3) did not get any long-term benefit from it in correcting those errors in a new narrative they wrote two weeks later (On Week 6).

There was no significant difference in non-grammatical accuracy gains from Writing 1 (Week 1) to the Delayed writing (Week 6) as well. Post-hoc pairwise comparison test also did not reveal any significant difference in non-grammatical accuracy gains from Week 1 to Week 6 between the three treatment groups as well as between the treatment groups and the control group.

4.4 Summary of Findings

One of the objectives of the present empirical research was to find out whether CF helps learners develop accuracy in their writing (both in revision tasks as well as in subsequent writings). Analysis of data revealed the following findings:

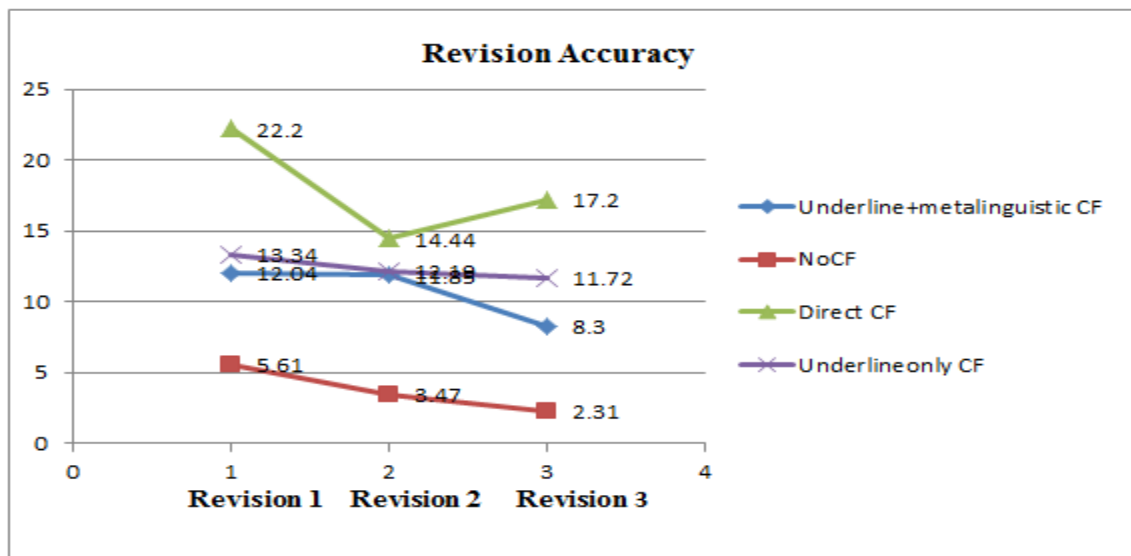
Revision effects

In terms of overall accuracy, in Revision 1, Direct FB Group outperformed Underline+metalinguistic and Underline only treatment groups as well as the control group. In Revision 2, all three treatment groups- Direct CF, Underline+metalinguistic, and Underline only outperformed No CF group. Out of the three treatment groups, Direct CF performed better than rest of the two treatment groups. In Revision 3, students who received Direct CF outperformed students who did not receive any CF (control group). Direct CF was also significantly more successful in correcting errors than Underline+metalinguistic CF. Students who received Underline only CF also performed significantly better than students in the No CF group (control group). Compared to the direct and indirect CF treatments, effect of Direct CF was larger than two indirect CF treatments. In terms of grammatical accuracy in revisions, Direct CF outperformed students in rest of the two CF treatment groups as well as students in the No CF group. In Revision 2, all three treatment groups (both direct and indirect) were highly successful in reducing grammatical errors compared to the control group (No CF group). In Revision 3, Direct CF performed significantly better than No CF and Underline+metalinguistic CF groups. Direct CF students also corrected more grammatical errors than students in Underline only CF group but the difference in error rates between them was not significant. Overall, in compare to direct and indirect CF treatments, direct CF treatment displayed more beneficial effects in improving students' grammatical accuracy in all three revision tasks. In terms of non-grammatical accuracy, none of the CF treatments demonstrated any beneficial effects in improving students' non-grammatical accuracy in Revision 1. However, in Revision 2 task, Direct CF and Underline only CF were

significantly more successful in improving students' non-grammatical accuracy than No CF treatment group. In Revision 3 task as well, both Direct CF treatment and Underline only CF treatment proved to be more effective in improving students' non-grammatical accuracy than no CF treatment.

The following graph presented in figure 4.1 provides a descriptive preview of the overall accuracy gains in three revision tasks, which is presented above. It displays that Direct CF group performed better than the other two treatment groups as well as outperformed the No CF group.

Figure 4.1 Overall accuracy gains in three revision tasks



Short-term transfer effects

As for short-term effects on overall accuracy, the treatment groups who received CF on Week 1 (in Writing 1) did not make any significant improvement in error reduction on a new writing task one week later (in Writing 2). In other words, there were

no short-term effects of CF treatments on overall accuracy in Writing 2. In case of accuracy gains from Writing 2 to Writing 3, significant change in error rate was found only in Underline+metalinguistic CF group. In other words, only Underline+metalinguistic CF on Writing 2 had short-term transfer effects on overall accuracy improvement in a new writing task one week later. In case of short-term transfer effects of CF treatments on grammatical accuracy, Direct CF group displayed significant grammatical accuracy gain from Writing 1 to Writing 2 in compare to Underline+metalinguistic CF group. The indirect CF treatments (e.g., Underline+metalinguistic CF and Underline only) and No CF treatment did not have any significant influence on the reduction of grammatical errors in Writing 2. On the other hand, none of the treatment groups, as well as the control group, displayed any significant grammatical accuracy gain from Writing 2 to Writing 3. In other words, CF treatments on Writing 2 did not have any significant short-term influence on grammatical accuracy improvement in Writing 3. In case of short-term effects of CF treatments on non-grammatical accuracy, none of the CF treatment groups as well as the control group displayed any statistically significant difference in non-grammatical accuracy gains from Writing 1 to Writing 2. In case of non-grammatical accuracy gains from Writing 2 to Writing 3 as well, none of the CF treatment groups and the control group displayed any statistically significant improvement.

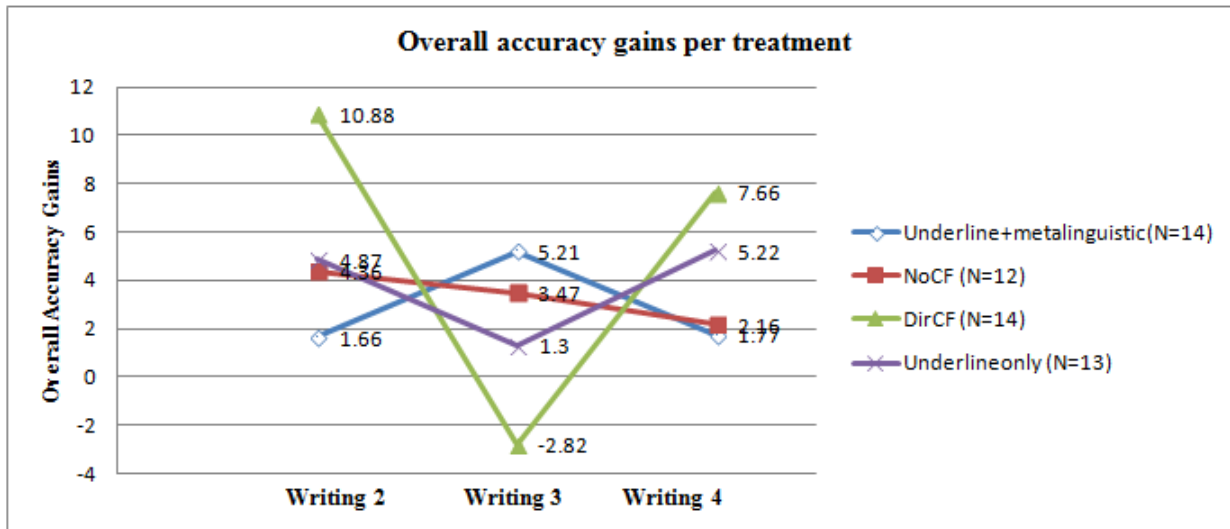
Delayed transfer effects

As for delayed effects of CF treatments on overall written accuracy, none of the CF treatment groups displayed overall accuracy gains from Writing 3 to the Delayed

writing (writing 4) task. While comparing the mean scores of overall accuracy gains from Writing 1 to the Delayed writing, no significant difference was evident. In case of delayed effects of CF treatments on grammatical accuracy, there were no significant gains by the four groups from Writing 3 to the Delayed Writing. A comparison between all four groups' mean scores of gain scores from Week 1 to Week 6 also did not display any significant improvement. Finally, in terms of delayed effects of CF treatments on non-grammatical accuracy, findings also demonstrated that all four groups did not make any significant improvement in non-grammatical accuracy gains from Writing 3 to the Delayed Writing as well as from Writing 1 to the Delayed writing. In brief, CF treatments did not have any significant durable or delayed effects on students' grammatical and non-grammatical accuracy (comparing Week 3 to Week 6 as well as Week 1 and Week 6).

The graph presented in figure 4.2 provides a descriptive preview of the study's main findings, which is presented above. It displays the accuracy development of the four groups over time. Only Underline+metalinguistic CF group made significant short-term improvement of accuracy from Writing 2 to Writing 3, and in case of the delayed accuracy gains (from Writing 3 to Delayed writing), only Underline only and Direct CF group made some improvement, but it was not significant.

Figure 4.2 Overall accuracy gains per treatment



An overview of all significant contrasts between treatments per session and accuracy type is presented in Table 4.21. Possible reasons for such findings and their implications will be discussed in Chapter 6.

Table 4.21 Summary of significant contrasts between treatment groups

	Overall accuracy	Grammatical accuracy	Non-grammatical accuracy
Revision 1	***Dir > NoCF **Dir > Underline+meta *Dir > Underlineonly	***Dir > NoCF *Dir > Underline+meta *Dir > Underlineonly	-
Revision 2	***Dir > NoCF ***Underline+meta > NoCF ***Underlineonly > NoCF	***Dir > NoCF **Underline+meta > NoCF *Underlineonly > NoCF	**Dir > NoCF *Underonly > NoCF
Revision 3	***Dir > NoCF *Dir > Underline+meta *Underlineonly > NoCF	***Dir > NoCF *Dir > Underline+meta	***Dir > NoCF *Underonly > NoCF
Accuracy gain: Narrative 1 to 2	-	*Dir > Under+meta	-
Accuracy gain: Narrative 2 to 3	*Underline+meta > Dir	-	-
Accuracy gain: Narrative 3 to Delayed Narrative	-	-	-

*p<.05. **p<.01, ***p<.001.

CHAPTER FIVE- DATA ANALYSIS AND RESULTS: QUALITATIVE DATA

This chapter addresses the last three research questions (RQ 5, 6 & 7) - namely, what aspects of CF learners consider useful for successful correction of errors, what are the learners' perceptions and attitudes towards the type of errors corrected, and what are the learners' perceptions and attitudes towards the type of feedback they received. Stimulated recall interviews were conducted in order to elicit learners' perceptions and attitudes towards the type of errors corrected and the CF they received. This chapter first describes the data analysis, and then reports the results of the qualitative analysis of all interview questions. The chapter ends with a summary of the findings.

5.1 Data Analysis

Twenty four students from three CF treatment groups participated in the prompted stimulated recall interview and ten students from the control group participated in the brief informal structured interview (please refer to section 3.4.3 for a detailed description of both the interviews). There were seven open-ended questions in the stimulated recall interview questionnaire (other recall prompts were provided by the researcher during the interview sessions if needed) and three open ended questions in the interview questionnaire for the No CF group (Appendix 4 and 5 for the questionnaires). The interview questions were designed to elicit answers to the research questions 5, 6, and 7 of the present research, which aimed to obtain a better understanding of ESL students' perceptions and attitudes towards direct and indirect CF treatments and their perceptions regarding the relative effectiveness of these CF treatments in reducing grammatical and

non-grammatical errors. The interview sessions were recorded using a digital audio recorder and later transcribed by the researcher of the present study. The transcriptions of the interview data were input to Microsoft Excel 2010 software. The open ended components from both of the interview questionnaires were analyzed qualitatively.

A grid was then prepared in Excel for all the responses for each interview question by the same researcher. The participants' answers to the open-ended questions were read repeatedly to generate common themes (e.g., perception statements, expressed reasons and their commonalities and differences etc.) for analysis. A color-coding technique was used to draw out emerging themes from the grid. The themes and coding categories in the current study that emerged from a close examination of the data varied among the interview questions.

To analyse the reliability of coding, both intra-coder and inter-coder checks were used when analyzing the qualitative data of the stimulated recall and the informal interview questionnaires. After finishing the coding of all the responses from the questionnaire items (i.e., interview responses from 7 stimulated recall interview questions and 3 No CF group interview questions), the researcher of the present study re-coded half of the questionnaire responses three weeks later. Same coding technique was used to re-code the data, i.e., reading the responses repeatedly to generate common themes (e.g., perception statements, expressed reasons and their commonalities and differences etc.) and color-coding those. The intra-coder reliability reached 98% agreement. A second coder, who was instructed to follow the same color-coding technique to draw out themes (e.g., perception statements, expressed reasons etc.), then coded five randomly selected

stimulated recall interviews in the current study. The inter-coder reliability reached 95% agreement. Any discrepancies in coding were resolved through discussion.

The themes, along with the results from all the interview questions are presented in the next section.

5.2 Results

This section reports the results of the qualitative analysis of all the interview questions (both stimulated recall interview with 3 treatment groups, and also the interview with the control treatment group).

5.2.1. What aspects of CF learners found useful

After showing each participant examples of some of their successful error corrections, the first stimulated interview question asked participants what helped them to correct those errors. The common themes emerged from the responses to this question in all three treatment groups were that they found the CF provided to them helpful because it provided them with idea about the errors they made and helped them to guess and think about the correct form.

The analysis of the participants' responses revealed that all three CF groups found the CF provided to them was useful to correct certain grammatical and non-grammatical errors. Each group indicated unique reasons for the relative usefulness of the CF and several issues were also revealed form the participants' responses. In the Direct CF group, among the 8 participants, 7 indicated that the CF was very helpful to them in reducing most of the errors as CF was provided directly to them, i.e., all of their errors

were corrected by the researcher by crossing out the erroneous forms and providing the corresponding target forms above the errors. The following table presents some of the examples of students' recall episodes (responses) resulted from recall prompt(s):

Table 5.1 The aspects of CF learners found useful: Examples from Direct CF group

Student	Researcher's additional recall prompt ⁵	Students' responses
1	Initially you wrote "Emu", but you corrected and wrote "an Emu". Why did you correct it?	Because, in here is the bird, a bird, so the Emu is 'a'. But I have to use 'an'. Feedback helped me.
2	You corrected from 'the Emu eating' to 'the Emu was eating'.	I think I need 'was'. Feedback gave me idea.

The other participant mentioned that as the original writing that received feedback was not in front of him during revision, he faced difficulty in correcting errors in some cases. However, he added that as he remembered that the researcher provided CF in some sentences. In one case, he read that sentence again and again, and eventually could figure out the error and corrected it.

In the Underline only CF group, the common theme emerging from the responses was underlining's ability to help guess and think about the correct form. All the 8 participants in this group indicated that although they were confused, underlining indicated that either the grammar or the vocabulary was wrong, and that it made them re-think, guess, and enabled them to correct the errors. Some of the examples of students'

⁵ As mentioned earlier, although the recall interview started with the main question no. 1, additional recall prompts were provided by the researcher during the interview sessions while needed.

recall episodes (responses) resulted from recall prompt(s) are presented in the following table:

Table 5.2 The aspects of CF learners found useful: Examples from Underline only group

Student	Researcher's additional recall prompt	Students' responses
1	You corrected the spelling here. Is this because the word was underlined?	Ya... underlining means that's wrong, so I thought there is a problem but I could not think about another one... 'Cause I think I made a correct one...so I just changed the character.
2	You needed to use capital letter here in the beginning of the sentence, and you corrected it. How did you correct it?	I was confused what I wrote wrong...and then I just chose why just use the capital letter...so that I used capital letter in this one. Because I did not have any spelling error in this word. So, I thought just only capital letter is the way.
3	You correctly used an article here in the gap where I underlined. Can you tell me why?	Because you have underlined here. So, I think I need article. I did not put article before.
4	Did you understand that this is a vocabulary mistake from the underline? How could you correct?	Vocabulary and some comma and period is sometimes confusing for me. I did not know about my mistakes so I guessed it's vocabulary mistake, so, I corrected it
5	You successfully used a preposition 'in' here : "I lived a...". What helped?	Because lived need place. So, I think I need a preposition. Underline helped.

The recall comments indicate that almost all the participants were initially not sure about the type or nature of the error they made, but the underlining CF treatment made the participants think about the nature of the errors, and also made them tap into their current linguistic knowledge. They thought about the correct use of grammar and lexical items based on the underlines provided in their writings by the researcher. In some

cases the Underline only CF helped participants understand what exactly the problem was, and in most cases they also guessed to figure out the ways to correct, and they were successful.

In the Underline+metalinguistic CF group, all of the eight participants reported that the metalinguistic information was helpful as it provided a hint or clue about the type or nature of error. They commented that the metalinguistic information helped them figure out the errors they made and correct those. Some of examples of such responses resulted from recall prompt(s) are presented in the following table:

Table 5.3 The aspects of CF learners found useful: Examples from Underline+metalinguistic group

Student	Researcher's additional recall prompt	Students' responses
1	How did you correct your tense mistake here?	At first I did not understand...then I figured out. Because your feedback gave a hint.
2	Why did you correct this wrong tense here in this sentence?	Because my sentence is wrong...you wrote 'wrong tense' so I changed it to correct tense.
3	You have added a correct preposition here: "...walking in the street --- night". The preposition was missing before 'night' here.	Your direction on the paper helped me to correct answer. Very enough info to me.

One participant commented that the metalinguistic information in this feedback helped her learn. She mentioned that as a learner of English, she usually translated from her native language during speaking and writing but most cases her translation was wrong. However, this CF treatment helped her find out where she was wrong. This opinion was reflected in the following statement:

“I need to check if this word is right and it's the right translation...so for me it makes sense but it is not correct and I need to learn...with your feedback I learned it's not the same ...it's not what I am trying to say”.

Another participant asserted that Underline+metalinguistic CF was not only useful, it was easy too. The reason for this CF being easy was that it provided the information about the errors made. This participant asserted that *“This feedback was easy...because the info was given”*.

5.2.2 What aspects of CF learners did not find useful

The second stimulated interview question or the recall prompt aimed to find out the reasons the participants could not correct some of the errors and what aspects of CF were not useful for them. The common reasons emerging from the responses were: forgetting or not remembering what to correct and not noticing the errors (in the Direct CF group), could not figure out the error from the CF (in the Underline only CF group), and due to lack of knowledge of the target form (Underline+metalinguistic CF group).

In the Direct CF group, 5 participants mentioned that although they reviewed errors indicated and corrected directly by the researcher for ten minutes, they could not remember the errors or what to correct because the corrected writings were not in front of them during revisions. Notably, as explained in section 3.4.1, to avoid students' revision by simply copying the corrections, the direct CF group received corrections on photocopies of their original narratives, which were taken away from them after ten minutes. The original Narratives (which did not have any CF) were returned to them just before they started their revision task. Some of the examples of students' comments or responses are presented in the following table:

Table 5.4 The aspects of CF learners did not find useful: Examples from Direct CF group

Student	Researcher's additional recall prompt	Students' responses
1	You did not correct the article error here. I corrected "A big bird was..." to " <i>the</i> big bird was..."	Because I forgot...I forgot to correct it.
2	You needed to correct the spelling here. Why didn't you correct it? You mean you needed more time to review?	Because I did not notice, and if I check once again, I could correct. I think I just missed it. This feedback was easy. But before I rewrite...if I read it for may times and many minutes and I can correct.
3	You did not add 'when' in this time clause.	This is a time clause. I forgot time clause 'when'.

In the Underlining only CF group, 6 participants indicated that they could not figure out the errors or what to correct from Underline only CF treatment. In some cases participants also mentioned that although underlining helped them understand what errors were made, they could not correct those as they did not know the target form or structure. Some of the examples of such responses are presented in the following table:

Table 5.5 The aspects of CF learners did not find useful: Examples from Underline only CF group

Student	Researcher's additional recall prompt	Students' responses
1	This word 'funny' was not appropriate here. Did you understand why I underlined it? You kept the same word. Why didn't you change it here?	May be it sound correct for me when I say it 'it was so funny' ...it sounds like a correct sentence ...I don't know the mistake... and then want to write not again the wrong thing but I write the wrong thing again.

2	I underlined the word ‘annoying’ but you did not change the word. But it was a wrong word here. It should be “annoyed” or you could use another word here.	I changed actually.. I thought it's a spelling mistake ...there is no 'y', but I put 'y'.
3	Why didn't you correct the wrong tense underlined here?	I could not find what is the error.
4	This preposition was underlined because it was wrongly used here. ..but you did not change the preposition.	Actually I did not know which preposition to use. I was not sure. I think I should change, but I was not sure.
5	You did not add an appropriate article here. You needed ‘the’ here. Didn't you understand?	I did not know what to use.

The participants in the Underlining+metalinguistic CF group also indicated that they could not utilize the CF due to their lack of knowledge in the target form. All 8 participants mentioned that although information about the errors was provided in this feedback, they did not know how to correct the errors. Some of the comments from recall interview that reflect this theme are presented in the following table:

Table 5.6 Examples of Underline+metalinguistic CF groups’ recall episodes from interview question no. 2 (the reasons for not being able to correct the errors)

Student	Researcher’s additional recall prompt	Students’ responses
1	You did not change the article ‘a’ here. I indicated it as ‘wrong article’.	I did not know which one to use.
2	Here I indicated “preposition is missing”. But you did not add a correct preposition. Why?	I did not know ...'to' may be? I don't know.
3	You did not correct the tense here. I wrote ‘wrong tense’.	Because I did not know how to correct it.

It was evident from the comments that although metalinguistic information about the errors were provided, for both grammatical and non-grammatical errors, due to participants' lack of grammatical and vocabulary knowledge they could not correct the identified errors.

5.2.3 The relative difficulty and easiness learners faced in correcting grammatical and non-grammatical errors

The results in this section are drawn from the recall interview questions 3 and 4. Participants were shown examples of selected grammatical errors (e.g., preposition, article, tense etc.) and lexical errors (e.g., spelling, vocabulary, word choice etc.) separately and they were asked whether that type of error was easy or difficult to correct and why. Participants' responses reflected their opinions and beliefs about the relative eases or difficulty in correcting both grammatical and non-grammatical errors in general.

In the Direct CF group, 3 out of the 8 participants mentioned that correcting non-grammatical errors was difficult, and 3 mentioned that correcting grammatical errors was difficult for them. The other 2 participants asserted that correcting both grammatical and non-grammatical errors from the Direct CF was easy for them. Each participant mentioned unique reasons for such opinions. The participants who indicated that correcting non-grammatical errors was difficult for them mentioned that it was hard for them to remember the spellings and meanings of some vocabulary. For example one participant commented that:

“Vocabulary error is difficult for me because you need to know them. I need to know many words.”

While commenting about the difficulty in correcting spelling errors, another participant mentioned that:

“Some spelling is not easy...it may be just a little mistake but you need to alter.”

On the other hand, the three participants who cited that correcting grammatical errors was difficult for them indicated their lack of knowledge of the target grammar as the reason for the difficulty. For example, one participant commented that:

“Grammar sometimes is difficult and vocabulary is easy to correct because, you have to remember how to use grammar....if I don't know grammar I don't know how to correct.”

The same reason for finding the grammatical errors difficult to correct from the Direct CF is echoed in the following comment:

“Grammar is hard because sometimes I don't know the grammar.”

These comments outlines that without having sufficient grammatical proficiency, learners' might not be able to utilize even the Direct CF treatment successfully.

In the Underline only CF group, 4 participants out of 8 mentioned that correcting grammatical errors was difficult, and the other 4 participants mentioned that correcting vocabulary errors was difficult for them. The participants who cited that correcting grammatical errors was difficult for them indicated that Underlining only CF was confusing for them and in most cases, they could not figure out what the mistake was.

These opinions, for example, are reflected in the following comment:

“It was difficult for me. I am not good at grammar...I was confused why you underlined my sentence. I was confused...so underline was not enough for me.”

While indicating that Underlining only CF was confusing, another participant commented that:

“I did not understand what is the problem. It is easy to see spelling problem...but grammar I am confused. Grammar was hard for me.”

Like some of the participants in the Direct CF group, some participants in Underline only group also indicated that due to their lack of grammar knowledge they could not correct the errors successfully. This participant mentioned that:

“Grammar is hard to correct because most of the time I am not sure what the mistake was and when I know the error I don't know how to correct them...maybe I don't know that grammar.”

Participants' comments display that as this group received Underline only CF, it was confusing for the participants to understand whether it was a grammatical error or not. Although underlining only did not help students figure out what errors did they make, it helped some participants notice that they made errors. Some of the participants even figured out the type of errors they made but it was hard for them to correct as they did not have sufficient grammatical knowledge to correct some of the errors indicated by the researcher.

The participants in the Underlining only group, who commented that correcting non-grammatical errors was difficult for them, also cited similar reasons placed forward by the participants in the Direct CF group. These participants also mentioned that they did not know the correct spellings and meanings of some of the vocabulary. For example, one participant commented that:

“Vocabulary was hard because I could not use dictionary...without dictionary even I don't know the spelling or I could not remember the spelling. It was hard because sometimes I know the meaning and I know the word but I don't know the spelling exactly.”

Similarly, another participant mentioned:

“Spelling is hard for me. Usually when I was writing, I did not think about spelling. Only after you gave me feedback in my writing...you gave me the underline, then I realized, oh it's too much spelling mistake. I knew my mistake but I don't know many spelling.”

Finally, in the Underline+metalinguistic CF group, among the eight participants, 4 mentioned that correcting grammatical errors was difficult, 3 mentioned that correcting non-grammatical errors was difficult, and one participant mentioned that both grammar and vocabulary errors were difficult to correct. Participants in this group indicated the similar reasons stated by the participants in the two other treatment groups for finding grammatical and non-grammatical errors difficult to correct from the CF provided to them. Grammatical errors and vocabulary errors were hard for some of the participants to correct because they did not have sufficient knowledge about target grammatical rules or vocabulary knowledge. They highlighted that understanding of grammar and vocabulary was required to successfully utilize the metalinguistic information and correct the errors.

Overall, out of the 24 participants who took part in the stimulated recall interview, 11 indicated that grammatical errors were difficult to correct, 10 indicated non-grammatical errors as difficult to correct, 2 indicated both grammatical and non-grammatical as easy to correct, and one participant indicated that both grammatical and non-grammatical errors were difficult to correct. Table 5.7 presents a summary of the overall findings per group.

Table 5.7 Summary: The relative difficulty and easiness in correcting grammatical and non-grammatical errors per group

	Direct CF group	Underline only CF group	Underline+ meta-linguistic CF group	Total
Grammatical errors difficult	3	4	4	11
Non-grammatical errors difficult	3	4	3	10
Both Grammatical and non-grammatical difficult	-	-	1	1
Both Grammatical and non-grammatical easy	2	-	-	2

Analysis of the participants' comments revealed a commonality in their stated reasons behind their beliefs regarding the relative easiness or difficulty of grammatical or non-grammatical errors. All three groups indicated their lack of sufficient English grammatical and non-grammatical (i.e., vocabulary, spelling etc.) knowledge as the reason for not being able to correct certain grammatical and non-grammatical errors.

5.2.4 What did learners think about the overall usefulness of the CFs

The fifth question or the recall prompt aimed to find out whether the participants found the CF treatment they received useful or not. Overall, in all three treatment groups, participants indicated that the CF treatment they received were useful for them. While all the participants in the Direct CF and the Underline+metalinguistic CF group indicated they found the CF they received very useful, some of the participants in the Underline only CF group indicated that underlinings did not help them in some cases as they did not understand what type of errors they made or how to correct those.

All the 8 participants in the Direct CF group indicated that the direct feedback they received was useful to them. A majority of the participants believed that Direct CF was useful as it helped them notice their grammar and vocabulary errors, enabled them to correct those, and in that process they learned grammar and increased vocabulary knowledge. These beliefs are reflected in some of the comments presented in table 5.8.

Table 5.8 Participants' comments regarding the usefulness of Direct CF

	Comments
1	Very very useful of course, because, I made a lot of mistake...but I got the feedback and I remember something. I didn't know something like 'use of but and comma' but I learned
2	I think it is useful, specially the grammar. It is good feedback about my grammar mistake.
3	Yes useful, because when I write a story sometimes if no one can correct me or when I am speaking English no body correct me if my sentence is correct, or my grammar or my vocabulary is correct or not. In writing...in this feedback I even notice that.

In the Underline only CF group, only 3 participants asserted that the Underline only CF was useful for them, but 5 other participants mentioned that sometimes underlining was not very useful for them to correct certain errors. The participants in this group who indicated that the Underline only CF was useful to them as it helped them notice the errors they made. In some cases they might not be able to correct all the errors, but they appreciated indication of the errors by underlining as it informed them that some type of error had been made. One learner mentioned that although it is a kind of indirect feedback, it might even help learn English because when learners see from the feedback that some sorts of errors have been made, they would think about it and try to fix the errors. However, a majority of the participants in this group found feedback in the form

of underlining not very useful as it did not inform them about the nature or type of the errors. These participants stated that Underline only CF treatment was not always useful for them because from underlining they were not clear about the nature and types of some of the errors. They clarified that certain types of non-grammatical (e.g., punctuation, appropriate use of words etc.) as well as grammatical errors were hard for them to understand and correct. They also clarified that when learners do not have knowledge about certain grammatical structures and their rules, Underlining only CF might make them more confused.

In case of the Underline+metalinguistic CF, among eight participants, 7 mentioned that Underline+metalinguistic CF was useful to them. As indicated by them, the metalinguistic information on top of the underlining helped them correct the errors and learn different English language rules. This belief is reflected in some of their comments presented in table 5.9 below.

Table 5.9 Participants' comments regarding the usefulness of Underline+metalinguistic CF

	Comments
1	Very useful because you can remember the errors and when you write again you can do better...not making mistake I mean
2	Of course very useful, because when I try to practice writing I don't know how to practice. For example, when I am keeping a diary there is no feedback. It is hard for me to know my mistakes...but here I got feedback and it was very useful. Very good practice for me.
3	Yes, of course. For example, I understand that the commas in English is very different than Portuguese, so I never can't put the comma correctly...but I discovered it now from the feedback. I perceived I am wrong all the time with the commas and I was looking for the reason. So, this feedback helped me discover my mistake.
6	Very useful. Every time I speak or write English may be I always make mistake. But if anyone did not correct my sentences, I think I will never fix them. It was very useful to correct mistakes I need this kind of feedback.

These comments display that the metalinguistic information helped the participants clearly understand what type of errors they made, and thus, helped them correct most of the errors. Most importantly, as reflected from the comments, Underline+metalinguistic CF helped them discover what errors they were making before and thus helped them learn different grammatical and lexical rules. Some of the participants even indicated that this feedback might have a lasting learning effect and would help not to repeat the same errors again.

Only one participant mentioned that this CF treatment was not fully useful. It was pointed out that while it might help correcting certain types of grammatical structures, it might not be useful for correcting certain complex grammatical structures. This idea is reflected in the participant's following comment:

“This is good, but sometimes I don't understand. I don't know...easy grammar is ok. For example, feedback for just article is ok. In difficult grammar I can't correct.”

In summary, the majority of the participants indicated that CF they received was useful for them to correct errors. A summary of the participants' reported beliefs is presented in table 5.10.

Table 5.10 Summary: The usefulness of CF in learners' opinions in three treatment groups

	CF treatment received was useful	CF treatment received was not useful
Direct CF group	8	-
Underline only CF group	3	5
Underline+metalinguistic CF group	7	1
Total	18	6

5.2.5 What are the perceptions of learners about the learning effects of the CF they received

The 6th recall interview question aimed to find out if participants would repeat some of the errors again in new writings in the future after receiving the three CF treatments. In particular, the aim was to find out if participants believed there would be some learning effects from the CF treatment they received more than one time on their errors.

Six participants in the Direct CF group indicated that they might not make certain kinds of errors in their future writings. They indicated that as the feedback corrected errors directly (i.e., as the corrections were provided), they might remember some of the grammar rules as well as meanings and spellings of some vocabulary. In other words, these participants believed that due to the learning effects from the Direct CF, they might not make certain errors in the future. It was also clarified by some of the participants that immediate correction (i.e., uptake) of certain errors might not be enough to ensure that that error would not be repeated in future, rather learners have to understand and remember the corrections. This view was echoed in the following comment:

“I am not sure...maybe I will do the same mistake again, because I think it's the thinking. I need to think about the error and remember. Also, as I need to use native language to think about that I may not make right thinking. But I will try to use...I think I can remember, but, I need more practice.”

Another participant also mentioned that it was possible to make the same mistake again as it would require more writing practice to become a better writer. This view was reflected in the following comment:

“I think it is possible to make the same mistake. I think I need to write more and more, and more practice to remember.”

In the Underline only CF group, all the 8 participants indicated that although they received CF treatment three times, they might make the same mistakes again. These participants' commented they believed that it would be more useful for them if the CF was provided a few more times (i.e., more than 3 times) as it would provide them with more understanding of the type of errors they made. A majority of the participants (6 participants) also indicated that from this Underline only CF treatment they were not clear what errors they made and how to correct. Therefore, as they did not understand what errors they made, they did not learn from this CF. Two participants added that if corrections were provided (not underlining only), they would have remembered and learned in that process. These views were reflected in the following comments:

- [1] *Even though you underlined all of the errors I could not understand yet, but if you gave me the correct answer it works well I think ...I think I will remember well in that way, because if I don't get all of correct answer before I thought through all of them, may be it does not work enough to me, sorry!*
- [2] *May be I will make mistake again because I was confused what was the errors from this feedback. If you tell me what is the mistake then it will help me more.*

One participant indicated that Underline only CF helped to think about the mistakes, but thinking alone and not understanding what errors were made, would not ensure that the same errors would not be repeated in future.

However, in the Underline+metalinguistic CF group, all the 8 participants mentioned that they might not make the same errors again. They indicated that as this CF provided them with information about the errors, it helped them understand what errors were made and they would remember those. For example, while stating their beliefs

about the learning effects of the CF they received, two participants made the following comments:

- [1] *I will remember. For example, in the last story, I remembered some corrections, so here, I understood that I need to put a different one.*
- [2] *This correction told me this is wrong tense, this is wrong word. I fixed my mistakes. I will remember...I think I will not repeat this mistake again.*

One participant also indicated this Underlining+metalinguistic CF taught her to be more careful and it would help her pay more attention to errors in future.

5.2.6 What type of CF learners believed would be most useful

The final question of the recall interview intended to find out which CF treatment learners believed would be the most useful. In the Direct CF group, 7 out of 8 participants selected Underline+metalinguistic CF as most useful, and only one participant selected Direct CF as most useful. The seven participants who believed that Underline+metalinguistic CF would be the most useful indicated that this feedback provided information about the type and nature of the errors they made, which helped them think about the errors as well as understand the reasons those were wrong. Some of the examples of participants' comments that reflect such belief is presented in the following table:

Table 5.11 Direct CF group's comments about the reasons they believed Underline+metalinguistic CF treatment would be most useful

	Comments
1	I think Underline+metalinguistic is better, because in case of Direct CF, someone tells me the correct answer directly, so, I don't think so much...like why did I make mistake, but in case of Underline+metalinguistic CF I have to do a lot of thinking...like why did I do mistake.
2	Underline+metalinguistic is the best, because you imply us what's wrong...implying what's the problem, such as the 'verb', 'the present and the past' is good. So, you just told me what kind of mistake we made...then we can think about that.
3	Underline+metalinguistic is the most effective because you don't tell answer directly. You just say the reason and I can think about what's the reason and if I can't understand then I can check the book. It's a good way to learn, because you don't tell me the answer, and I want to think what is the answer, and may be then I will remember it.

One participant in this group believed Direct CF was most effective because this CF had clarity, i.e., it corrected errors directly and was easily understandable. The participant thought Underline only CF might not be understandable, and interestingly, mentioned that providing information about the errors in the Underline+metalinguistic CF would be an additional responsibility and burden on the teacher's part.

Seven out of 8 participants in the Underline only CF group also selected Underline+metalinguistic CF as the most useful method to provide CF treatment. Only one participant selected Underline only CF as most useful. There was commonality in participants' stated reasons for believing Underline+metalinguistic CF as most useful. Like the participants in the Direct CF group, participants in the Underline only group also indicated that Underline+metalinguistic CF would be most useful because this feedback provides information about the errors learners make, allows them to think about those

errors, and understand the reasons those were wrong. Such belief is reflected in some of the participants' comments presented in the following table:

Table 5.12 Underline only CF group's comments about the reasons they believed Underline+metalinguistic CF treatment would be most useful

	Comments
1	I think no. 3 (underline+metalinguistic) is better. Maybe it's better if you find your mistakes by yourself, not by the teacher. So, I think it could be helpful to make your writing better. This is kind of a middle way of other two feedback. So, I think for grammatical error this is the best.
2	Underline+metalinguistic is best, because you gave me information about the problem...like spelling, article, tense. This gives me chance to think about my mistake. I think it's also easy to correct this way.
3	Underline+metalinguistic is my favorite. It gives more information...give me chance to think more. Direct FB I don't like it...With this I don't think...I will forget after.
4	I prefer Underline+metalinguistic, because you gave me more to think about, like what's the problem, what should I change. You also gave time to think about it. So, I think it is effective. It gives me chance to think about mistake.

Only one participant in this group who selected Underline only CF as most useful made the following comment:

"Underline is better because I understand my mistake...like that mistake is grammatical or vocabulary, so 'underline only' is ok."

Finally, in the Underline+metalinguistic CF group, 6 out of 8 participant selected Underline+metalinguistic CF and two participants selected Underline only CF as the most useful CF treatment. The six participants' stated reasons for believing Underline+metalinguistic CF as the most effective CF are in line with the reasons stated by the participants of two other CF groups. The six participants in this group also indicated that the metalinguistic information about the type or nature of error allowed them to think about the errors they made and helped them understand why they were

wrong. Some of the comments that reflect such perceptions are presented in the following table:

Table 5.13 Underline+metalinguistic CF group's comments about the reasons they believed Underline+metalinguistic CF treatment would be most useful

	Comments
1	Underline+metalinguistic is better because with this you think about what is the correct answer, and with no. Direct CF, I can see I need to change this but maybe I don't need to think about the mistake. Better to try again and again and then correct.
2	Underline+metalinguistic is best. Direct CF is not good for me.. I can see everything, so I don't remember. In Underline only feedback I can't understand what the problem is, but in Underline+metalinguistic I have information and I can think about my problem.
3	Underline+metalinguistic is best. Direct feedback is very easy, but depends on level of student. If this is very easy sentence I can understand from the only underline, but if I was in beginner level, maybe I can't understand from only underlining. So, this one -Underline+metalinguistic is better than Underline only. I think, teacher needs to give different feedback to different level.
4	Underline+metalinguistic is best because in Underline only CF I can't understand and I can't correct them. It's not clear. Direct CF is too easy. I will not remember this feedback. In Underline+metalinguistic I can use my brain.

As it is evident in these comments, one participant made an important point that the success in utilizing certain type of feedback might depend on the learners' proficiency level. Direct CF might be easy for some learners with higher proficiency in English. This participant also suggested that teachers should provide feedback considering the levels of the students. The two participants in this Underline+metalinguistic CF group, who selected Underline only as the best method of providing error feedback indicated that due to Underline only CF's ability to make learners think, this CF would be better than the two other CF treatments. In their opinion, providing metalinguistic information would make it easier for learners to figure out what types of errors were made. Only underlining

for them might be enough for some learners to stimulate thinking and to find out the type and nature of errors they make.

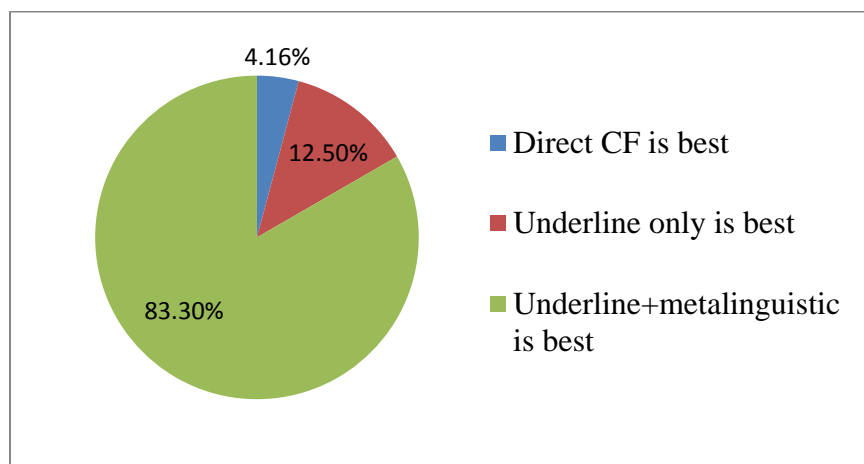
In summary, out of 24 participants from the three groups, 20 selected Underline+metalinguistic CF treatment as the most effective method of providing feedback on learners' writing. Three participants selected Underline only CF treatment and only one participant selected Direct CF as the most effective feedback. These findings are summarized in table 5.14.

Table 5.14 Summary of findings from recall interview question no. 7

Group	Direct CF is best	Underline only CF is best	Underline+metalinguistic CF is best
Direct CF Group	1	x	7
Underline only CF Group	x	1	7
Underline+metalinguistic CF Group	x	2	6
Total	1	3	20

Figure 5.1 describes the percentage distribution of participants' preferred CF types in all three groups.

Figure 5.1 Percentage distribution of preferred CF types (Out of 24 participants in all 3 groups)



Some important points were emerged from the comments of the participants they made during the recall interview. The participants, who selected Underline + metalinguistic CF as the best feedback method, indicated that Direct CF might not be useful as it provides correct answers. In their opinion, Direct CF feedback would be easy as they can simply correct errors without thinking about the causes, and as a result, some learners might not remember the corrections. The participants added that, in the case of Underline only CF, it was not easy to understand what errors were made, so it might not easy to correct errors from this feedback. However, in the case of Underline+metalinguistic CF, the metalinguistic information would help learners understand the problems (i.e., errors) and enable them to fix those successfully. One participant from the Underline+metalinguistic CF group highlighted that the effectiveness of CF treatments might depend on the learners' proficiency levels. While lower proficiency level students might find indirect CF difficult to understand and process, higher proficiency level learners might find Direct CF easy.

The next subsection presents results from the structured informal interview conducted with the participants in the control group (i.e., No CF group). The prompted stimulated recall interview was not conducted with the participants in the control group as they did not receive any corrective feedback. The participants in the control group were asked to find out and self-correct their own errors in their narratives. The researcher of the present study decided to conduct an informal interview with a separate questionnaire as it would provide valuable information and enrich data for the present research. The main aim of this interview with the participants in the No CF group was to find out their opinions about self-correction as a tool to improve written accuracy, and also to explore their opinions regarding the usefulness of the three CF treatments the participants in the treatment groups received. Ten participants participated in the interview.

5.2.7 No CF group's opinions about the role of feedback in general

As mentioned in section 3.6, although No CF group did not receive any feedback, in an informal and a brief individual interview the participants of the No CF group were asked to give their opinions about feedback in general. They were also shown the three CF types that were used in the present study as treatments in three other groups and were asked to indicate which CF type would be useful in their opinion and why.

Out of 10 participants, 6 mentioned that self-correction helped them to correct errors, and four participants indicated it as not helpful. Those who believed self-correction helped them indicated that while revising their writings they thought about the possible errors they made and find some of those errors. They also indicated that re-

writing or revision of a text written earlier increased the possibility of self-correction of errors, which is important in their opinions to improve the quality of their writing. These ideas are reflected in some of their comments presented below:

- [1] *“Self-correction is good because I can find the mistake from the first time I wrote.”*
- [2] *“If I don't write my sentence again, I would not correct these mistakes. So, I think it was useful.”*
- [3] *“It's good idea to make the students know their own errors and correct by themselves.”*

On the other hand, participants who did not find self-correction useful indicated they did not find out what errors they made, and preferred some form of feedback in their writings. For example, one participant made the following comment while expressing concerns regarding the usefulness of self-correction:

“I want to get some feedback from teacher when I give teacher my paper. With this (no feedback), when I get my paper again, I don't know what's incorrect sentence on my paper.”

These participants indicated that it might not be possible for some learners to find out what errors they made by themselves. This belief was reflected in one of the comments presented below:

“I personally think that students usually don't know where their mistakes are.”

One participant indicated preference for one-to-one teacher and student meetings to discuss the errors the students make.

The 6 participants also mentioned they believed self-correction could improve their writing. Three of these participants indicated self-correction as the self-discovery of the errors and mentioned that the successful correction of the errors would help them not to make the same mistake again in future. One participant pointed out that although

teachers did not provide any feedback in their group, it was a good opportunity to practice writing, and added that practice itself might help improve writing proficiency. Another participant pointed out that self-correction could be useful to improve writing speed and writing skills. One participant also indicated that unlike teachers' direct feedback, self-correction would allow learners to think more about their errors, which is in line with the beliefs of majority of the participants in the treatment groups who preferred indirect CF treatment over Direct CF because they believed it enabled learners to think about their errors and learn in that process.

While the participants in the No CF group were shown the three CF types that were used in the present study as treatments and asked to indicate which CF type would be useful in their opinion, 5 participants indicated that they believed Underline+metalinguistic CF would be most useful for them to improve accuracy in their writing tasks. Three participants selected Underline only CF and rest of the two participants selected Direct CF as most useful. The five participants who indicated Underline+metalinguistic CF would be most useful, expressed that metalinguistic information about their errors would help them understand what type of errors they made and enable them to think about the successful corrections of those errors. The three participants who believed Underline only CF would be most useful for them also highlighted the ability of underlining to foster thinking about the errors made as the main reasons for selecting this CF type. These findings from the interview with the No CF group participants are in line with the findings from the stimulated recall interview with the treatment groups (reported in section 5.2.6) in that like those participants, a majority of the participants in the No CF group believed that indirect CF (mainly

Underline+metalinguistic, and also Underline only) would be most beneficial due to the facts that it enables learners to think about the errors made and find out possible corrections for those errors. The two participants who selected Direct CF as most effective indicated that it would help them correct their errors most effectively as they would know what errors were made.

5.3 Summary of Findings from Prompted Stimulated Recall and Structured Informal Interviews

Analysis from the stimulated recall interview revealed that all three CF groups indicated the CF provided to them helped them correct errors. Direct CF helped participants to reduce errors as it was provided directly to them. On the other hand, Underline only CF treatment helped participants think and guess about the nature and type of the errors they made, and eventually correct the errors successfully. In case of the Underline+metalinguistic CF treatment, it provided participants with an idea or clue about the nature and type of the errors they made, which helped them correct errors. With regards to the aspects of CF that learners did not find useful, the participants in the Underline only group mentioned that Underlining only CF did not help them figure out what some of the errors were. Majority of the participants of both Underline only CF group and Underline+metalinguistic CF group also pointed out that in some cases they could guess what errors they made but due to their insufficient grammatical or lexical knowledge they could not correct those errors. For most participants (46%) in all three groups, grammatical errors were difficult to correct. These participants indicated that their lack of sufficient English grammatical and non-grammatical (i.e., vocabulary, spelling etc.) knowledge made it difficult for them to correct grammatical and non-

grammatical errors. Regarding the overall usefulness of the CF, majority of the participants in all three treatment groups also indicated that CF they received was useful and helped them learn different grammatical and non-grammatical features. Some of them indicated that they would not make the same kinds of errors in future. In all three groups, the common reason for finding the CF treatments useful was the learning effects of the CF treatments (for both direct and indirect CF treatments). While asked to comment on the type of CF they believed would be most effective, most of the participants (20 out of 24 participants) selected Underline+metalinguistic CF treatment as the best or most effective method of providing feedback on learners' writing.

CHAPTER SIX – DISCUSSION AND CONCLUSIONS

This chapter discusses the findings of the current study with regard to the effectiveness of CF on the accuracy of L2 learners' revision tasks as well as its transfer effects to subsequent writings, the relative effectiveness of direct and indirect CF, the correctability of grammatical and non-grammatical errors from direct and indirect CF, the aspects of CF learners considered useful for successful correction of errors, learner' perceptions and attitudes towards the type of errors corrected, and learners' perceptions and attitude towards direct and indirect CF that they received. This chapter also presents theoretical implications and implications for L2 teaching pedagogy, followed by a discussion of the limitations of the current study and directions for future research.

6.1 Discussion

Research Question 1: Does written CF have any effect on the accuracy of L2 learners' revision of the same piece of writing?

The first aim of the present research was to find out whether written CF helps learners improve their writing accuracy in the revision of an initial text. Like some earlier research (e.g., Ashwell, 2000; Fathman & Whalley, 1990; Ferris, 1997; Ferris & Roberts, 2001; Sachs & Polio, 2007), it was found in the present research that comprehensive CF led to improved accuracy in revision tasks. In particular, the finding demonstrates that both direct and indirect CF (which includes Underline only CF and Underline+meta-linguistic CF) helped learners successfully reduce errors in all the three revisions. This finding is noteworthy, as unlike previous studies that provided treatment only one time

(e.g., Truscott & Hsu, 2008; Van Beuningen et al., 2012) and found significant effect of either direct or indirect CF, the present study provided treatments three times, investigated accuracy gains in three revision tasks, and found significant effect of both direct and indirect CF types in all three revisions. Furthermore, all three CF treatments demonstrated significant grammatical accuracy gains in all three revisions, and Direct CF and Underline only CF resulted in non-grammatical accuracy gains in Revision 2 and Revision 3.

This finding that written CF led to improved accuracy in revision tasks is also in line with the findings from two recent studies, i.e., Truscott and Hsu (2008) and Van Beuningen, De Jong and Kuiken (2012). In Truscott and Hsu's (2008) study, learners did show improvement in accuracy from comprehensive indirect CF in the only revision task, but not on a new writing task. On the other hand, Van Beuningen, De Jong and Kuiken (2012) found significant effects of both direct and indirect CF on revision task (as well as found accuracy gains from CF on the new pieces of writing, one and four weeks after the treatment was provided). Thus, these findings together with the finding of the present study reconfirms that CF helps to improve accuracy in revision tasks. Although, Truscott and Hsu (2008) argued that, "successful error reduction during revision is not a predictor, even a very weak predictor, of learning" (p. 299), like Van Beuningen (2011) the present researcher also argues that "from a learning-to-write perspective" (p. 124) CF can be a useful tool that can help learners becoming more successful writers.

The results of the qualitative analysis showed that all the participants in the treatment groups found the CF treatment provided to them useful (see discussion for research question 5 in this section). The reason for all three treatment groups being very

successful in reducing errors in the three revision tasks might be that the majority of the learners found the CF provided to them useful and due to this reason they responded well to the feedback. During revision tasks, their attention might be mainly focused on corrections and they also focused on fully utilizing the feedback provided to them (Van Beuningen, 2011). It was also found that the Direct CF group was more successful in correcting errors compared to two indirect CF groups (Underline only and Underline+metalinguistic) during revisions because the corrections were explicitly provided to them. Therefore, they could have remembered those corrections during revision tasks. On the other hand, both Underline only and Underline+metalinguistic CF groups also found these two types of indirect CF useful and outperformed No CF group in revision 2 task. Underline only CF outperformed No CF group in Revision 3 task. Indirect CF was successful as it helped the learners think about the type and nature of errors made. In the case of Underline only CF, the underlining was only an indication that some sorts of errors have been committed and although the learners were supposed to have same level of proficiency (i.e., intermediate level in the present study), only those who had sufficient level of linguistic ability could successfully correct the errors. On the other hand, the other indirect CF group (i.e., Underline+metalinguistic) additionally received information about the errors they made and in this group too learners with sufficient linguistic background utilized that information successfully. The participants in the control group could not demonstrate any improvement of accuracy in this present research because they did not receive any feedback. As no CF was provided to the learners in this group, they probably could not notice the errors and also, during revisions their focus might not be on correction of errors only (Van Beuningen, 2011).

Although Direct CF had a higher success rate in reducing errors in revision tasks compared to the two indirect CF types in the present research, this finding demonstrates the merit of CF in the forms of underline only and underline together with metalinguistic information as well in accuracy improvement in revision of initial written works in intermediate level classrooms. The finding that CF lead to significant accuracy gains in revisions increases the importance of revision tasks in ESL writing classrooms as successful error correction during revision might lead to improved motivation in L2 writing among learners who are learning to write, which can also lead to successful acquisition of L2 (Van Beuningen, 2011).

Research Question 2: Does written CF have any transfer effect on the accuracy of L2 learners' new pieces of writing over time?

The second aim of the present research was to find out whether CF had any learning effect. In particular, the aim was to investigate if there were any short-term or delayed learning effect of direct and indirect CF (i.e., Underlining only CF and Underline+metalinguistic CF). Van Beuningen (2011) pointed out that although it is interesting to see that CF leads to improved accuracy during revision, the most important concern of SLA research is the long-term effect of CF or L2 development. According to Truscott and Hsu (2008), to investigate the potential effects of CF, research should compare two independent written works instead of comparing an initial text to its revision. Thus, the present research also investigated both short-term and delayed effects of comprehensive CF on written accuracy.

It was found in the present research that only Underline+metalinguistic CF had a short-term positive effect on overall written accuracy gains (i.e., accuracy gains only from Writing 2 to Writing 3; one week after participants received this CF). However, this positive effect of Underline+metalinguistic CF was not retained after two weeks. Furthermore, Direct CF and Underline only CF did not display any short-term or any delayed learning effects. The participants who did not receive any CF treatment (No CF group) in this research also failed to make any short-term or delayed improvement of accuracy.

Recent research has already demonstrated that learners who have received focused CF (i.e., correction of specific error category) are successful in reducing target errors in new pieces of writing (e.g., Bitchener, 2008; Bitchener & Knoch, 2008, 2009a, 2010b; Ellis et al., 2008; Sheen, 2007, 2010). However, in a most recent study, Van Beuningen, De Jong and Kuiken (2012) found that comprehensive CF led to improved accuracy. In their study, the positive effect of comprehensive CF was not only visible one week after the learners first received treatment, but it was also retained over a period of four weeks. The present research also provided CF on all errors (i.e., comprehensive CF) and found only a short-term positive effect of such treatment (the positive effect was retained over a period of one week). In Van Beuningen, De Jong and Kuiken's (2012) study, the participants were native speakers of Dutch learning English. As Dutch is closer to English language the participants might have beneficial effect of their L1 (as Dutch and English share a lot of cognates) in English writing. CF in their study thus might have more beneficial effect on the participants (i.e., they could retain the positive effect of CF) compared to the present study, as most of the participants in the present study were from

Asian origin who came to Canada to improve their English skills for a shorter period of time.

The short-term accuracy gains that was found in the present study differs from that of Truscott and Hsu (2008) and Liu's (2008) study in that they only found accuracy gains on the revised texts, but CF did not display any durable or delayed accuracy gains. Notably, Truscott and Hsu (2008) provided treatment only one time and measured short-term improvement on a new writing task one week after the treatment was provided. Unlike Truscott and Hsu's (2008) study, in the present research, the benefits of indirect CF found on the revision tasks did extend to a new writing task performed a week later. In Liu's (2008) study, no beneficial effect of both direct and indirect CF was found four weeks after students received the treatments. In the present study, the positive effect of Underline+metalinguistic CF was found in a new writing one week after receiving treatment. However, this short-term effect showed not to be durable (i.e., no beneficial effect of treatment on Writing 3 was found after two weeks in Writing 4 on week 6).

Although CF treatments were provided over an extended period of time (3 times) in the present research, it did not display any delayed transfer effect from Week 3 to Week 6 (except the fact that Underline+metalinguistic CF displayed short-term beneficial effect, i.e., it helped to improve overall accuracy after 1 week). There might be several reasons for such a finding. It is possible, as also argued by Van Beuningen (2011), that learners' displayed significant improvement of accuracy in revisions as during revision tasks their attention might have been explicitly focused on accuracy as during that time they were made aware of the erroneous forms or features through CF. On the other hand, there was no significant improvement of accuracy in new writings as during new

narrative writing tasks, learners' attention probably was not explicitly focused on accuracy. The nature of writing tasks (i.e., narrative/story writing) used in this present research might have compelled learners to pay minimum attention to accuracy in the new writing tasks. Although there are not much research evidences to claim that nature of writing tasks or genre could be a contributing factor of attention to accuracy, Van Beuningen (2011) claimed that the communicative nature of writing task might allow learners to focus less on accuracy. In her study, writing tasks involved participants to write emails to friends explaining biology related topic. Van Beuningen asserted that these writing tasks were communicative in nature "without any inherent focus on language form" (p. 134), which in her opinion might have allowed learners to provide minimal attention to accuracy in the post-test sessions in her study.

The lack of feedback retention in the present research could also be due to the lack of learners' successful intake of CF during revision. As some researchers have argued, even learners' successful CF uptake does not guarantee long-term acquisition (e.g., Ellis et al., 2001; Long, 2007, Van Beuningen, 2011). Research (e.g., Van Beuningen, 2011) has also demonstrated that deep-rooted or fossilized errors might not result in retention even when learners successfully adopt or use the corrections during revision. Learners' in the present study demonstrated successful uptake of CF during revision tasks, but except for the Direct CF and the Underline+metalinguistic CF group, other groups did not display successful acquisition of targeted features in new writings (after 1 week). Furthermore, the CF groups also did not display any improvement of accuracy in the delayed writing. This finding thus highlights that the level of successful

uptake of correction in three revisions might not have facilitated a durable learning effect or acquisition.

Another possible reason for not finding any significant durable or delayed effects of CF on accuracy improvement in the present study could be the use of comprehensive CF or correcting all errors in learners' writings. As several researchers (Bitchener, 2008; Ellis et al., 2008; sheen, 2007) have argued, targeting specific error type or limited error categories would be more effective than comprehensive feedback. These researchers have also pointed out that comprehensive CF might not facilitate SLA as L2 learners usually have limited processing capacity. In the present research, Direct CF and Underline+metalinguistic CF facilitated accuracy gains in new writings (one week after providing the CF). However, accuracy gains from these CF treatments were not consistent in all four new writing tasks, and the three treatment groups also varied in accuracy gains in the new writing tasks and did not display any improvement in the delayed writing task. As this present research targeted broad range of linguistic features, it might have caused cognitive overload for some learners and interrupted their feedback processing (Van Beuningen, 2011). Thus, as Van Beuningen (2011) and Van Beuningen, De Jong and Kuiken (2012) pointed out, processing comprehensive CF could have been cognitively demanding for some learners (Van Beuningen, 2011). Furthermore, it could also be the fact that participants' EFL background, their past experience with the CF types they received, and their expectations of CF types might have played a role in CF's not resulting in long-term effects on accuracy improvement. It could be possible that some participants might not have received CF in the form of underlining before. Indirect CF groups, especially Underline only CF, might have needed more instruction or training

on processing and interpreting the error codes. Learners' expectations or preference of CF type also might have played an important role in the lack of long-term retention of CF. It was found from the interview data of the present research that majority of the participants in all groups preferred Underline+metalinguistic CF and indicated that this CF type would be the most useful in improving written accuracy (for a discussion on this finding, please see question no. 7 in this section). Thus, participants' expectations matched with the CF they received and they were more motivated in this group, which might have led to learning or retention (though it was short-term). The finding regarding learners' expectations with Underline+metalinguistic CF and their preference for it sheds light on the possible reasons for both direct and indirect CF's failure to retain accuracy gains in the new writings, and also demonstrates that learner preference for CF type might play a positive role in the improvement of accuracy in L2 writing.

Research Question 3: Does the effect of CF depend on the type of FB (direct vs. indirect)?

Apart from investigating the overall effectiveness of CF on revision as well as on new writing tasks, the present research also focused on investigating the relative effectiveness of direct and indirect written CF. In the present study written CF has been categorized into two major types: direct (i.e., teacher indicates errors and provides target forms) and indirect (i.e., teacher indicates the errors only but does not provide target forms). Indirect CF was provided to two experimental groups in the forms of only underlining, and underlining together with metalinguistic information.

The findings demonstrated that in Revision 1 task, Direct FB Group outperformed Underline+metalinguistic and Underline only treatment groups as well as the control group. In Revision 2 task, all three treatment groups (Direct CF, Underlining+metalinguistic, and Underline only) outperformed No CF group. In Revision 3 task, Direct CF group outperformed students who did not receive any CF (control group). Direct CF was also significantly more successful in correcting errors in Revision 3 than Underlining+metalinguistic CF. Underline only CF group also performed significantly better than No CF group (control group). In sum, it was found in this present research that direct CF was more effective in reducing errors in all three revision tasks compared to indirect CF. Out of the two indirect CF treatments, Underline only CF was slightly more effective than Underline+metalinguistic CF during revisions.

The finding of the present research that Direct CF was more successful in correcting errors in revision tasks than the two indirect CF groups is in line with the result of a small scale study reported by Van Beuningen (2011). Her study showed that during revisions, students receiving direct feedback made significantly fewer errors than students who received indirect CF. However, the finding of the present study that Direct CF was more successful in revision tasks differs from the findings reported in Truscott and Hsu (2008). In their study, indirect CF in the form of underlining of the errors was highly beneficial in correcting errors during revisions.

In the case of the findings with regards to CF's short-term and delayed effectiveness, no short-term transfer effects on overall accuracy gains were found for both direct and indirect CF from Writing 1 to Writing 2. In new writing task no. 3, only the Underline+metalinguistic CF had a short-term effect on the improvement of accuracy,

but Direct CF did not display any short-term effect. Furthermore, both direct and indirect CF did not have any significant durable or delayed transfer effects on the improvement of accuracy. Although for a short period of over a week, indirect CF in the form of Underline+metalinguistic CF in the present research displayed overall accuracy gains. This finding is more in line with that of Ferris's (2006) study where indirect CF proved to be more effective in improving L2 students' accuracy in newly written texts, and direct CF was more successful in gaining revision accuracy. This finding is also reflective of Lalande's (1982) findings which showed that student in the indirect CF group outperformed students in the direct CF group. However, the finding that indirect CF displayed short-term accuracy gains in this study differs from that reported in Bitchener and Knotch (2010) and Chandler (2003). In Bitchener and Knotch's (2010) study, direct CF was statistically more successful than indirect CF. In Chandler's study (2003) also, students receiving direct feedback showed improvement in accuracy over students who received three different types of indirect feedback.

Although in the present research, Direct CF proved to be more beneficial than indirect CF in revision tasks, indirect CF in the form of Underline+metalinguistic CF also displayed significant accuracy gains over the period of one week and Direct CF and Underline only CF did not display any short-term or delayed accuracy gains. Based on these findings, it might not be possible to come to a solid conclusion on the relative superiority of direct and indirect CF because the findings revealed that the effectiveness of the direct and indirect CF types depended on the type of error that was targeted. A discussion on the interaction between feedback types and error types will be included in the following while discussing the findings for question number 4.

Research Question 4: Does the effectiveness of CF depend on the type of errors ('grammatical' or 'non-grammatical')?

Apart from investigating the overall effectiveness of CF and the relative effectiveness of direct and indirect CF, the present research study also investigated the differential effects of direct and indirect CF on grammatical and non-grammatical errors. In particular, the main aim was to test Ferris's (1999; 2002; 2010) and Truscott's (2001; 2007) claims regarding the correctability of grammatical and non-grammatical errors from CF. According to Ferris (1999; 2002; 2010), CF on writing errors might lead to the improvement of accuracy of rule-governed or grammatical features. On the other hand, Truscott (2001; 2007) argued that correction of errors might be beneficial only in case of reducing non-grammatical errors.

In the case of the revision accuracy, the findings demonstrated that grammatical errors were more correctable by direct CF in all three revision tasks. However, students were successful in correcting grammatical errors by both Underline+metalinguistic and Underline only indirect CF in revision task 2. In terms of non-grammatical accuracy, both Direct CF and Underline only CF were significantly more successful in improving students' non-grammatical accuracy than No CF treatment group in revision tasks (in 2 and 3). In terms of the short-term and delayed improvement of grammatical and non-grammatical accuracy from CF, only the participants who received Direct CF displayed significant short-term grammatical accuracy gains in a new writing one week after they received treatment (in Writing 2; in week 2). No short-term effect of Direct and indirect CF on non-grammatical accuracy was evident. In addition, neither direct nor indirect CF had any effect on improving grammatical and non-grammatical accuracy in new writing

over time. The results of the present research study, thus, demonstrated that while both direct and indirect CF enabled learners to improve their grammatical and non-grammatical accuracy in their revision tasks, only direct CF enabled learners to significantly improve their grammatical accuracy in a new narrative written one week after receiving the treatment. However, this short-term effect of direct CF on grammatical accuracy gains was not consistent on new narratives written in Week 3 and in Week 6 (delayed writing task).

Based on the above findings, it can be concluded that direct CF has the potential to promote grammatical accuracy (although the effect was only short-term). Although both direct and indirect CF were successful in reducing grammatical and non-grammatical errors during revisions, this success might not be considered as learning. Truscott and Hsu (2008), for example, argued that successful reduction of errors during revision is not a predictor of learning. In Truscott and Hsu's (2008) study, the benefits of indirect CF found during revision was not found in a new writing task one week later, and they concluded that there was no relation between success on the revision task and learning (while measured by performance on a new writing task). But unlike Truscott and Hsu's (2008) study, the present research compared error rates in all three new writings (i.e., between Week 1 & 2, between Week 2 & 3) to find out the short-term transfer effect of CF and also it compared error rates in Week 1 (Writing 1) and Week 6 (Writing 4) as well as error rates in Week 3 (Writing 3) and week 6 (Writing 4) to find out delayed effect of CF. The result displayed short-term grammatical accuracy gains in new writing (written 1 week after receiving CF) from direct CF, and thus demonstrated direct CF's potential ability to improve grammatical accuracy. This finding of the present research

study thus questions Truscott's (2001; 2007) claim that CF is not beneficial for grammar correction by showing that CF enabled learners to improve grammatical accuracy over time (although for a short period), i.e., learners displayed a learning advantage when their grammatical errors were corrected directly.

The findings of the present research study are in line with Van Beuningen, De Jong and Kuiken's (2012) study, which also investigated the differential effects of comprehensive CF on grammatical and non-grammatical errors. In their study, only direct CF resulted in grammatical accuracy gains in new writing. Non-grammatical accuracy, on the other hand, proved to have benefited more from indirect CF. Based on their findings they concluded that "both grammatical and nongrammatical errors are amenable to CF but they benefit from different types of corrections" (p.33). In the present study, direct CF facilitated grammatical accuracy gains in new writing as well. Thus, in the present study direct CF was more effective or suitable for grammatical errors but not for non-grammatical errors, and this finding further affirms that learners might get the advantage of learning grammar or gain grammatical accuracy from direct CF. Notably, very few early studies which compared direct vs. indirect feedback have investigated the effectiveness of comprehensive CF on grammatical accuracy (e.g., Ferris, 2006, Van Beuningen, De Jong and Kuiken, 2008). Ferris (2006) differentiated between five major error categories (i.e., verb errors, noun errors, article errors, lexical errors, and sentence structure errors) and found that indirect CF significantly reduced verb form errors. Thus, Ferris's (2006) findings are not in line with the finding of the present study. On the other hand, in Van Beuningen, De Jong and Kuiken's (2008) study, the form related errors were sub-divided into nine error categories (e.g., word form, word choice, spelling, word

order, addition or omission of a word, incomplete sentences, punctuation and capitalization), and in that study direct CF displayed a significant long-term effect on reducing form related errors.

Several recent studies (e.g., Ellis et al., 2008, Sheen, 2007, Sheen, Wright and Moldawa, 2009) investigated the effects of focused feedback vs. unfocused feedback. These studies targeted only a single grammatical feature and demonstrated that focused error correction positively contributed to accuracy gains in writing and also showed that direct feedback benefited learners the most. Based on their findings, Sheen, Wright, and Moldawa (2009) asserted that “unfocused CF is of limited pedagogical value whereas focused CF can contribute to grammatical accuracy in writing” (p. 556). The finding of the present study that direct CF had a short-term transfer effect on grammatical accuracy in a new writing, however, refutes their claim and demonstrates that unfocused CF (i.e. comprehensive CF) has potential pedagogical value. Furthermore, as these studies focused their investigation on the same grammatical feature (i.e., English articles), “it is not clear whether focused correction will prove generally effective in improving learners’ linguistic accuracy” (Sheen, 2010; p. 173). Bitchener, Young and Cameron (2005), on the other hand targeted three error categories (i.e., definite article, prepositions, and the simple past tense) and investigated whether different types of feedback on these three targeted error categories helped L2 writers improve the accuracy of their use in new pieces of writing. They found that past tense and article errors are more amenable when direct feedback is used in combination with oral direct feedback. Although they provided CF on three error categories, their finding that grammatical errors (past tense and article

errors) were amenable to direct CF is consistent with the finding of the present research study.

The result of the present study demonstrating that only direct CF displayed significant short-term success in acquisition of grammar also questions the argument (e.g., Doughty, 2003) that error correction only promotes metalinguistic understanding but not acquisition. However, the fact that only direct CF displayed short-term success and indirect CF was not successful in reducing both grammatical and non-grammatical errors in new writings could have been due to the cognitive demand posed by the indirect approach (Van Beuningen, 2011). It might be that learners in the present study could not process or utilize the indirect CF due to their lack of sufficient language proficiency. The learners were only successful in correcting linguistic features that they were able to correct themselves (e.g., non-grammatical errors like spelling errors and punctuation errors) (Van Beuningen, 2011). It could also be the fact that as this present research provided CF on wide range of linguistic features at the same time, it might have created a cognitive overload for the participants. This cognitive overload possibly prohibited them from processing feedback.

Participants' attitudes towards grammatical and non-grammatical errors (as reflected in the interview responses) also explain why there was lack of long-term success in reducing grammatical errors from the three CF treatments. As mentioned earlier (in section 5.2.3), 46% of the participants mentioned that grammatical errors were difficult for them to correct. All three groups also indicated their lack of sufficient English grammatical and non-grammatical (i.e., vocabulary, spelling etc.) knowledge as the reason for not being able to correct some of the grammatical and non-grammatical

errors. This implies that, although participants of the present research were all from intermediate level ESL classes, probably most of them did not have sufficient English proficiency to successfully utilize indirect CF. Direct CF was successful (in both revision tasks and at least in one new narrative written one week after the CF treatment) because it provided learners with sufficient information to resolve their more complex grammatical errors during revisions, and this helped some of the learners instantly internalize the correct form. However, as Van Beuningen (2011) explained, learners who received indirect CF could not be successful in retaining grammatical accuracy in the long run because “they did not know if their own hypothesized corrections were accurate” and this “might have prevented them from internalizing the correct structures” (p. 87). Thus indirect CF’s failure to display short-term and long-term grammatical and non-grammatical accuracy in the present research study also supports the claim that learners’ levels of proficiency and metalinguistic awareness influence their ability to benefit from error correction, in particular from indirect CF (Ferris, 2004; Hyland & Hyland, 2006).

Research Question 5: What aspects of the CF do learners consider useful for successful correction of errors?

While indicating the reasons for being successful in correcting certain errors, the majority of the participants in the three treatment groups indicated during the stimulated recall interview that the feedback provided to them was useful. In the Direct CF group, the participants indicated that the CF was very helpful to them in correcting the errors as both the errors and their corrections (i.e., the target forms) were identified. Although participants’ writings, in which Direct CF was provided, were not in front of them during

revision tasks, some participants were able to remember the corrections provided to them (as explained in section 3.4.3, in order to avoid learners' revision of the texts just by copying the corrections, the participants were not allowed to keep their texts that had received CF treatment).

The participants in the Underline only CF treatment indicated that as their errors were pointed out by only underlining, it was initially confusing for them to understand what errors were committed. However, the participants indicated that underlining of the errors helped them think and guess about the nature and type of errors they made, and eventually correct the errors successfully. Participants in the Underline+metalinguistic CF treatment indicated that the metalinguistic information provided in this feedback type helped them correct certain errors successfully because it offered them ideas or clues about the nature and type of errors they made. On the other hand, while indicating the reasons for not being able to successfully correct some of the errors, the participants in the Direct CF group mentioned that they forgot or could not remember what to correct. They also mentioned that they could not notice the errors during the revision tasks as they had to revise their narratives without having the corrected narratives (i.e., narratives that had received CF treatments) in front of them. The participants in the Underline only group commented that Underlining only CF did not help them figure out what some of the errors were. Most of the participants commented that they did not know what the errors were and even if they knew, they did not have sufficient grammatical or lexical knowledge to correct those errors. The participants in the Underline+metalinguistic CF group also indicated their lack of knowledge in the target form or lexicon as the reason for not being able to correct some of the errors. This opinion indicated that although the

metalinguistic feedback provided participants with information about particular grammatical or non-grammatical errors they made, they did not have sufficient target language knowledge to utilize that information and successfully correct some of the errors.

These findings demonstrate that although the participants of the Direct CF group indicated they found the Direct CF very helpful in correcting the errors, most of them had difficulty remembering some of the errors and their respective CF (i.e., the required corrections). It might be due to the reason that during the revision task, their corrected written texts (i.e., original writings that received CF treatments) were not in front of them. Participants in this group probably needed more time to review the errors in order to remember what errors they made and the successful corrections of those errors. In the case of the Underline only CF type, the indirect nature of the CF helped participants to think, guess the correct forms, and while this process helped some of them correct errors in some cases, in some cases it did not. The participants' background knowledge in the target language and also their experience with this type of feedback both might have played a role in the success or failure in utilizing Underline only CF type. The participants who could correct some of the errors might have understood what errors they made and how to correct those from the underlinings alone. Some of the participants might also have had prior experience or training in receiving CF in the form of underlining only, which made it easy for them to utilize the indirect information about errors provided to them in the form of underlines. In the case of the Underline+metalinguistic CF type, the metalinguistic feedback here allowed most of the participants to successfully correct errors because the information about certain

grammatical or non-grammatical errors they made were provided to them. Although the information about errors was only provided indirectly as a hint or clue about the type and nature of errors made, participants who had sufficient target language knowledge were successful in correcting some of the errors. While comparing to another indirect CF type provided in this research (i.e., Underline only), Underline+metalinguistic CF created less confusion about the nature and type of the errors, but participants in some cases were not successful in correcting the errors due to their insufficient grammatical or lexical knowledge.

The findings regarding the aspects of CF treatments that learners found very useful are reflective of the results of the quantitative analysis of the accuracy gains of three CF groups in this study. The participants in three groups, who successfully corrected different types of errors from the three CF treatment types, expressed that the CF they received helped them correct errors successfully. This assertion matches with the findings of the present study in that although the participants in all three treatment groups did not display any statistically significant delayed or durable improvement in accuracy gains, they were significantly successful in reducing errors in their three revision tasks.

Research Question 6: What are the learners' perceptions and attitudes towards the type of errors corrected?

Almost 50% of the participants (11 out of 24 participants who took part in the stimulated recall interview) indicated that grammatical errors were difficult for them to correct, and ten participants indicated non-grammatical errors as difficult to correct. For two other participants, both grammatical and non-grammatical errors were easy to correct, and one

participant found both grammatical and non-grammatical errors as difficult to correct. All three groups indicated that their lack of sufficient English grammatical and non-grammatical (i.e., vocabulary, spelling etc.) knowledge was the reason they could not correct some of the grammatical and non-grammatical errors. Responses to this question are in line with participants' stated reasons for being able to successfully correct (and also not being successful in correcting) certain errors discussed in the previous research question. In the case of the Direct CF group, although both grammatical and non-grammatical errors were corrected by the researcher in the Direct CF group, the participants could not remember some of the corrections, and even if they could remember in some cases, they failed to correct those errors due to their lack of vocabulary and grammar knowledge. In the Underlining only CF group, participants in some cases could not figure out the type or nature of the errors with the help of underlining alone. It was also found that although in some cases they could figure out the type of the errors they made, they found it difficult to correct some errors due to their insufficient grammatical or lexical knowledge. Participants in the Underline+meta-linguistic CF group also asserted that, although they received information about the type of error they made in the form of metalinguistic CF, they could not utilize the information because they did not have sufficient knowledge about the target vocabulary or grammatical structure and rules.

These findings thus provide valuable insights into the process of second language acquisition in that second language learners might fail to successfully utilize both direct and indirect CF treatment to correct both grammatical and non-grammatical errors due to their lack of sufficient knowledge of the target language. It was also evident from the

findings that knowledge of grammar rules and vocabulary also might not be sufficient in successfully utilizing the CF treatments. For successful corrections of certain grammatical or non-grammatical errors, learners might need to know how to use specific grammatical or lexical items appropriately in different contexts. For instance, it was highlighted by some participants during the interview that a learner might know the meanings of certain vocabulary, but they might not know their correct spellings or the appropriate use of those vocabularies in different contexts. In the same way, due to students' background in EFL settings, a learner might have knowledge of English tenses but he or she might not know how to use that knowledge in real life situations or contexts.

The findings explain possible reasons why participants in all three treatment groups did not have any delayed gains in both grammatical and non-grammatical accuracy. As discussed earlier (while discussing findings of research question number 4), there were no delayed grammatical or non-grammatical accuracy gains in all three treatment groups in this present research. Only Direct CF had short-term grammatical accuracy gains and none of the treatment groups had any short-term non-grammatical accuracy gains. It was also found in the case of the revision tasks that while all three treatment groups successfully reduced errors in revision 2, Direct CF was mainly successful in revisions 1 and 3. As direct feedback provided correction of all errors, participants probably did not have cognitive difficulty in processing information from this feedback to correct both grammatical and non-grammatical errors. A majority of the participants in the Direct CF group also might have remembered the way their errors were corrected, which helped them make fewer errors in the revisions of the writings they

produced earlier. As was also explained earlier (in research question number 1), during revision tasks, in all three groups, participants' attention might have been drawn explicitly to accuracy due to the CF treatments, but during writing new texts their attention was not drawn to accuracy (Van Beuningen, 2011). Furthermore, overall, the participants in all three groups might have failed to retain the immediate corrections or could not successfully take in the corrections and thus failed to improve grammatical and non-grammatical accuracy in the new writing tasks.

Research Question 7: What are the learners' perceptions and attitudes towards the type of feedback they received?

Twenty-four participants from the three treatment groups were asked during the recall interview if they found the feedback they received in the present study useful to correct errors, if the feedback they received would help them not to make the same errors in future in new writing tasks, and also, if they think CF is necessary to become a proficient writer. In an informal interview, the participants in the control group were also asked if they found self-correction useful in reducing errors and also, if they believed that self-correction could help improve their writing proficiency. Participants in the interviews in all three treatment groups and the control group were also asked to select which CF treatment type- Direct CF, Underline only or Underline+metalinguistic would be the most useful in their opinion. Discussions on participants' perceptions and attitudes regarding the usefulness of CF treatment they received in reducing errors as well as the CF's possible learning effects, and all four groups' (both treatments and the control) preference for CF type are presented here.

While responding to the interview question regarding the usefulness of the direct and indirect CF to correct errors in this present research, all eight participants (100%) in the Direct CF group and seven participants (87.5%) in the Underline+metalinguistic CF group indicated that they found the CF they received very useful. However, only three participants (37.5%) from the Underline only CF group mentioned that they found underlining useful. The eight participants in the Direct CF group found direct correction very useful because it helped them notice their grammatical errors, enabled them to correct those, and also enabled them to learn some grammar rules and their use in appropriate situations or contexts. Seven participants in the Underline+metalinguistic CF group indicated that the metalinguistic information in addition to the underlines clarified the type and nature of errors they made and also helped them learn different grammatical and lexical rules. The three participants in the Underline only CF group mentioned that the underlines helped them notice the errors they made. They also indicated that when they could successfully correct errors from underlining CF, it helped them learn those particular grammatical or lexical rules. In all three groups the commonality in students' responses was their belief that CF might have learning effects.

On the other hand, the participants from Underline only CF group who indicated that they did not find the CF treatment they received completely useful, added that the underlines did not help them elicit clear information about the nature and type of some of the errors. They indicated that finding corrections of grammatical errors was more difficult from the Underline only feedback, as it did not provide information on how to or what to correct. One participant in the Underline+metalinguistic CF group also indicated that certain complex grammatical errors might not be possible to correct with

Underline+metalinguistic CF. All the participants who did not find either of the indirect CF treatments useful highlighted that successful corrections of grammatical errors might not be possible if learners do not have sufficient knowledge about certain grammatical structures and their rules. This belief regarding the necessity of having sufficient level of grammatical knowledge to become successful in processing indirect feedback is in line with Ferris's (2004) and Hyland and Hyland's (2006) arguments that indirect CF might be less useful to lower proficiency level L2 learners as they lack sufficient metalinguistic awareness to self-correct their errors.

Participants' responses from the recall interview question regarding how useful the direct and indirect CF was to correct errors in this present research matches with participants' stated beliefs regarding the possible learning effects of CF treatments they received. A majority of the participants from the Direct CF group (6 participants) and all eight participants from the Underline+metalinguistic CF group who mentioned that they found the CF provided to them useful also reported that they might not make the same errors or will make fewer errors in the future. Most of the participants in the Underline only CF group reported that they did not find this CF treatment very useful for correcting grammatical errors and these learners also indicated that they might make the same mistakes again. Participants in the Direct CF group and Underline+metalinguistic CF group believed that their CF treatment would help them remember the errors and their corrections and, therefore, they might make fewer errors in the future. The Direct CF and Underline+metalinguistic CF groups' statements, beliefs and opinions regarding the usefulness of CF treatment they received in correcting errors in the present research and the possible learning effects of these treatments (i.e., if the CF treatments would help

them not to repeat the same errors in future) fully supports the findings of the present study with regards to the effects of the three CF treatments on revisions as well as on short-term and long-term accuracy gains. As found in the quantitative analysis, reported earlier in section 4.3, while all three treatment groups significantly outperformed the control group with respect to revision accuracy in all three writing tasks, Direct CF outperformed all other CF types in Revisions 1 and 3. Furthermore, only Underline+metalinguistic CF displayed short-term overall accuracy gains, and only Direct CF had short-term accuracy gains in grammar. During the recall interviews, both Direct CF and Underline+metalinguistic CF groups asserted that they found the CF provided to them useful in reducing errors and also indicated they believed that they might not make the same errors in the future. Both of these groups also performed better than other groups in this present research and demonstrated short-term learning from the CF they received.

The result of the present study also demonstrates that the Underline only CF group did not benefit from the feedback they received. The stated beliefs and comments of the participants in this group regarding the usefulness and learning effects from the Underline only CF, completely matches the findings regarding the short-term and long-term effects of Underline only CF treatment in that no such effects from this CF on written accuracy were found in this present research. While commenting on the CF they received, all the participants in the Underline only CF group indicated that they did not understand what errors they made and they could not learn from this CF as it only indicated the errors, and therefore there were chances that they would repeat some of the errors in future. Other possible reasons for participants of the Underline only CF group's

not finding this CF useful could be their educational background, proficiency levels, their attitude towards this CF type or their expectations and preference for written CF types. The participants of Underline only CF group were successful in reducing errors in the revision tasks, but most probably their attention was not on errors in the new writing tasks. Also, as argued earlier, immediate correction of certain errors or uptake might not be enough to ensure that there would be no repetition of those errors in future, but understanding of what type of errors were made and intake of the corrections are vital. The reason for Underline only CF group's not preferring this type of CF and their being unsuccessful in accuracy gains could also be that there was a mismatch between their expectation with the CF type and the CF they received. As Storch (2010) also emphasized, learners' motivation and confidence as writers could be negatively affected by the feedback they receive. Storch and Wigglesworth (2010) also concluded based on the findings of their study that "learners' attitude towards the feedback affects not only whether and how learners respond to the feedback provided, but ultimately whether there is long term learning" (p.44). Furthermore, the participants in the present research are all from EFL backgrounds, and the majority of them indicated they would return to their countries after attending ESL schools here in Canada. These learners might not have experience having this type of indirect feedback or as L2 writing serves different purposes in ESL and EFL contexts (Hedgcock & Lefkowitz, 1994), learners' preference for error feedback and feedback type could be different. Although 60% (6 out of 10 participants) in the control group (No CF group) indicated they found the self-correction useful and they might not make the same errors in future, their perceptions and opinions do not match with the findings of the current research as they could not improve accuracy

in the revision tasks, and also they did not display any significant short-term or long-term accuracy gains in this present study.

While indicating which CF would be most effective in improving written accuracy, 83% of the participants from the three treatment groups (20 out of 24 participants) and 50% (5 out of 10 participants) from No CF group selected Underline+metalinguistic CF treatment as the best or most effective method of providing feedback. The participants from the three treatment groups, who selected Underline+metalinguistic CF as the best feedback method, indicated that the metalinguistic information provided in this CF type would help them understand what type of errors were made and enable them to fix those successfully. These participants highlighted that as Direct CF corrects all errors and provides corrections, it would be very easy and, as it does not involve thinking, learners might not remember the feedback or the corrections. They also added that it might not be easy to correct errors from Underline only CF as it might be difficult to understand what errors were made from the underlines. It was also pointed out by one participant that while lower proficiency level students might find indirect CF difficult to understand and process, higher proficiency level learners might find Direct CF easy. The five participants from the No CF group who selected Underline+metalinguistic as the most useful also mentioned the same reason for selecting this CF type as most effective. They further expressed that as this CF type would provide information about the errors, it would enable them to think about the successful corrections of those errors. Participants' expectations and preference regarding the metalinguistic feedback and their perceptions regarding the usefulness of this CF type reflect Sheen's (2007) assertions regarding metalinguistic CF. According to Sheen

(2007), while direct corrective feedback only helps learners notice examples of specific forms, indirect feedback like metalinguistic feedback helps learners not only notice the forms but also know the rules behind the forms. Therefore, to Sheen, metalinguistic feedback is better than direct feedback.

The findings from the present research regarding learners' preference for Underline+metalinguistic CF due to its ability to promote thinking and foster learning also add value to Ferris's (2004, 2006) argument in support of indirect feedback. In her opinion, indirect feedback has long-term effects on the accuracy of students' writing and makes students engage in problem-solving learning and become independent learners. Indirect CF has also been found effective in some previous research (e.g. Ferris & Roberts, 2001; Frantzen, 1995; Lee, 1997; Makino, 1993). These studies have reported that learners had ability to self-correct their errors and they could improve accuracy in writing from indirect CF. However, like one participant from Underline+metalinguistic CF group in the present research, who pointed out that lower proficiency level students might find indirect CF difficult, Ferris (2004) and Hyland and Hyland (2006) also pointed out that lower proficiency level L2 learners might benefit less from indirect CF since they lack necessary metalinguistic awareness to independently correct their errors.

Participants' perceptions and preference for indirect CF in this study, however, does not correspond with some of the previous studies (e.g., Amrhein & Nassaji, 2010; Jodai, Farrokhi & Zoghi, 2011). In both of these studies, learners indicated they preferred direct or explicit correction of their errors. In Amrhein and Nassaji (2010), learners explained that explicit types of CF helped them "remember their errors and understand how to fix them" (p. 115). In Jodaie et al. (2011), participants mentioned that direct CF

makes the corrections clear to them and keeps them from making the same mistakes again. These reasons for learners' preference for direct feedback in these two studies, however, match with the reasons placed forward by three participants in the present research (1 from Direct CF group, and two from No CF group) who selected Direct CF as the most effective feedback type. These participants from the present study argued that direct CF is easily understandable and that it explicitly informs them what errors are made and how to correct those. Although participants in Jodaie et al.'s (2011) study preferred direct feedback, they concluded that direct feedback can make students more passive and more and more dependent on teachers. Amrhein and Nassaji (2010), on the other hand, argued that following students' preferences might misguide student expectations, and also, referring to Saito (1994), they concluded that "teachers need to shift students' expectations to better fit what will contribute to the development of writing" (p. 117).

6.2 Conclusions

The findings of the present study suggest that both direct and indirect CF in the forms of underlining and underlining in combination with metalinguistic information can significantly improve both grammatical and non-grammatical accuracy during the revisions of texts written earlier. The findings also demonstrate that Direct CF has the potential to promote grammatical accuracy in new writings, at least, of intermediate level learners, and thus refuted Truscott's (1996; 1999; 2004; 2007; 2009) claim that CF has no place in L2 classrooms because grammar correction would be more likely to hamper accuracy development.

The study also found that Underline+metalinguistic CF displayed a significant effect in improving overall accuracy in a new narrative written one week after the learners received the treatment. This finding further suggests that indirect CF also has the potential to improve accuracy in new writings. The findings of the present study thus make a valuable contribution to the theoretical arguments in favor of both direct and Underline+metalinguistic CF types. However, it was not clear from the present study whether Underline+metalinguistics CF and Underline only CF (i.e., indirect CF types used in the present study) are effective in improving non-grammatical accuracy. Thus, the findings further clarified that no single form of CF can be effective in addressing all types of linguistic errors (e.g., Ferris, 1999; Truscott, 1996). Furthermore, the findings of the present study demonstrated that the three treatment groups varied in accuracy gains in four new writing tasks. For example, when Underline+metalinguistic CF group gained accuracy in Writing 2 task, both Direct CF and Underline only CF declined in accuracy gain. On the other hand, Underline+metalinguistic CF did not display any accuracy gain from Writing 3 to Writing 4, but Direct CF and Underline only CF group gained accuracy in this case. The accuracy rate in No CF group, however, had declined gradually. These results indicate that as CF groups received CF, there was learners' response to CF, but as No CF group did not receive any CF, they could not notice the errors and as a result they could not correct the errors and their accuracy rate declined. Thus, these findings help us understand that effect of CF is far more complex and we can not simply make categorical assertions like 'error correction is not effective' or 'CF does not have any place in L2 classrooms' (e.g. Truscott, 1996; 1999; 2004; 2007; 2009).

Findings from the qualitative study (i.e., investigation of learners' perceptions and attitudes toward CF) demonstrate that different aspects of direct and indirect CF help learners in different ways to successfully attend to different types of CF. In the case of the Direct CF, learners who successfully corrected errors found the explicit information or correction provided to them useful as it helped them understand what errors they made and also helped them remember the corrections. Learners who were successful in correcting errors from indirect CF indicated that indirect CF in the form of underlining and in the form of underline together with metalinguistic CF helped them notice the errors, think about the errors, guess the correct form(s) or feature(s) and also remember the corrections. However, learners were not always successful in attending to errors. In the case of the learners who could not be successful in correcting errors, most of them found Underline only CF unclear and confusing, and even if they understood what some of the errors were (especially in case of Underline+metalinguistic CF), they could not correct due to their lack of sufficient metalinguistic knowledge. This finding also indicates that both grammatical and non-grammatical errors could be difficult for intermediate level learners to correct from indirect CF in the forms of underlining and underlining in combination with metalinguistic information if they do not have sufficient L2 proficiency. Findings from the qualitative study also indicated that while learners consider both direct and indirect CF as useful, indirect CF in the form of underline together with metalinguistic CF is preferred by a majority of the intermediate level learners as it provides valuable information about the errors made as well as promoting thinking and better understanding.

The effectiveness of focused CF was already established in the previous research (e.g., Bitchener, 2008; Bitchener & Knoch, 2008; Bitchener & Knoch, 2009; Bitchener & Knoch, 2010a; Bitchener & Knoch, 2010b; Ellis et al., 2008; Sheen, 2007; Sheen, 2010b). The present study is one of the very few research studies (e.g. Truscott & Hsu, 2008; Van Beuningen et al. 2012) that have provided CF treatment on all existing errors in students' writing tasks (i.e., investigated the effectiveness of comprehensive CF in improving accuracy in L2 writing) and found improvement of accuracy in new writings (written one week after providing CF treatment). This finding displays the merit of comprehensive CF in reducing errors in L2 writing at the intermediate level. In other words, while the effectiveness of focused CF is already established in previous research, the findings of the current study demonstrate that comprehensive CF can also be a useful pedagogical tool for L2 teachers to help learners improve their accuracy in writing. The present research has thus made a valuable contribution in the field of research on written CF's role in fostering SLA.

6.3 Theoretical Contributions

This study has addressed the methodological limitations of the previous studies and provided CF treatment to learners on more than one occasion (3 times, which no other studies provided before). Thus, this study contributes significantly to the current knowledge of written CF in L2. The findings also made several notable contributions to the theoretical understanding of the role of written CF in SLA.

First, SLA theory has differentiated explicit and implicit knowledge and it has been explained that implicit knowledge of L2 could be considered as the knowledge of

the language, and explicit knowledge consists of the knowledge about the L2 system. Some scholars who considers CF as useless (e.g., Krashen, 1985; Truscott, 1996) argue that correction of errors may be useful in developing explicit knowledge only, which will never lead to L2 development. On the other hand, as Van Beuningen (2011) has pointed out, the most common view is that both explicit and implicit knowledge of L2 contribute to the SLA process (e.g. DeKeyser, 1998; Doughty & Williams, 1998; Hulstijn & Schmidt, 1994; Long & Robinson, 1998; McLaughlin, 1990; Schmidt, 1990; Schmidt & Frota, 1986; Swain, 1985), however, it is still an empirical question whether CF is stored as explicit or explicit knowledge. Truscott (1996) claimed that CF can only lead to ‘pseudolearning’. But the findings of the present study have demonstrated that CF led to short-term improvement in overall accuracy gains as well as gains in grammatical accuracy in new writings (written one week after receiving CF treatment). These findings demonstrate that error correction has the potential to lead to accuracy development and learning and, thus, contradicts Truscott’s claim.

Second, the findings have contributed to the theoretical debate regarding the effectiveness of focused vs. unfocused CF. According to the advocates of focused CF (e.g., Bitchener, 2008; Ellis et al., 2008; Sheen, 2007), targeting a single or some specific type(s) of errors would be more effective than targeting all or large number of error categories. In their opinion, comprehensive CF might not be effective in promoting or facilitating SLA as learners usually have limited processing capacity, and also that asking learners to deal with a large number of linguistic features might be cognitively overloading for them and it might result in failure in feedback processing (Van Beuningen, 2011). In the present research study, comprehensive CF only displayed short-

term (one week) improvement in accuracy (in cases of Direct CF and Underline+metalinguistic CF), but no delayed or durable effect of CF was found. The three treatment groups also varied in accuracy improvement and also, short-term accuracy gains from the CF treatments were also not consistent in the new writing tasks. As it was pointed out earlier, as the present research targeted broad range of linguistic features, it might have caused cognitive overload for some learners and interrupted their feedback processing consistently (Van Beuningen, 2011). The findings of the present research, thus, lend support to the hypothesis that unfocused CF might be too cognitively demanding to process for some learners.

Third, the findings of the present research study have also made valuable contributions to the theoretical arguments in favor of both direct and indirect CF types. It has been claimed that indirect feedback is superior to direct feedback as it has greater potential to foster SLA (Ferris, 2004, 2006). It has also been argued that indirect feedback has long-term effects on the accuracy of students' writing and that it makes students engage in problem-solving learning or more profound forms of language processing and helps them become independent learners. On the other hand, direct CF has also been argued to be superior to indirect CF as it presents learners with clear and sufficient information needed for cognitive learning processes, such as noticing and hypothesis testing (e.g., Bitchener and Knoch, 2010b). It has also been pointed out that indirect feedback cannot lead to new learning as it assumes that the erroneous forms are already known by the learners and it expects learners to self-correct their errors (Ellis et al., 2008). It was found in the present study that direct CF leads to the short-term development of grammatical accuracy and Underline+metalinguistic CF (indirect CF)

leads to short-term improvement of overall accuracy (both grammatical and non-grammatical). Although no delayed effect of direct and indirect CF (i.e., Underline only CF and Underline+metalinguistic CF) on grammatical and non-grammatical accuracy was found, and indirect CF in the form of underlining only did not display any short-term improvement of accuracy, the findings of the current study provide support for both of the hypotheses mentioned above regarding the superiority of direct and indirect CF (in case of the current study, in the form of underlining in combination with metalinguistic information). While direct CF clearly demonstrated its potential to improve grammatical accuracy, Underline+metalinguistic CF also proved to have potential to improve both grammatical and non-grammatical accuracy. Thus this finding also supports Sheen's (2007) argument in favour of metalinguistic feedback. Sheen pointed out that metalinguistic CF is better as it helps learners not only notice the forms but also know the rules behind the forms. Finding the effectiveness of both direct CF and indirect CF in the form of underlining in combination with metalinguistic information in the present study further clarified Ferris (1999) and Truscott's (1996) observation that "no single form of CF can be effective in addressing all linguistic error types" (Van Beuningen, 2011; p. 136).

Finally, the finding that both direct and indirect CF (in the form of underlining in combination with metalinguistic information) was successful in reducing errors during revisions in the present research also made valuable contribution to the theoretical arguments with regards to the role of successful uptake in L2 acquisition. In SLA, uptake is defined as a learner's response to a CF instance (Van Beuningen, 2011) or uptake is "what the student attempts to do with the teacher's feedback" (Lyster and Ranta, 1997; p.

49). According to Ellis, Basturkmen and Lowen (2001) and Long (2007), successful uptake is not a predictor of interlanguage development. On the other hand, some other researchers (e.g., Ellis & Sheen, 2006; Lightbown, 1998; Lowen, 2004; Lyster, 1998; Sheen, 2004) have argued that learners' level of uptake might be an indication of L2 acquisition. They believe that reformulation of forms from CF indicates that noticing has taken place, and noticing, in turn, facilitates SLA (Van Beuningen, 2011). The success in reducing errors during revision tasks in the present study is an indication that learners noticed the errors from CF and successfully corrected majority of those errors, i.e., successful uptake of CF took place during revisions (as was also supported by Ellis & Sheen (2006), Lightbown (1998), Lowen (2004), Lyster (1998), and Sheen (2004)). Learners in the Direct CF group and Underline+metalinguistic CF group also made accuracy gains from the CF on new writings within a period of one week in the present study. This also displays that noticing of errors during revisions might have resulted in short-term learning. However, these short-term improvements of accuracy from Direct CF and Underline+metalinguistic CF did not display any delayed or durable effect, which also lends support to Ellis, Basturkmen and Lowen's (2001) hypothesis that the successful CF uptakes might not guarantee long-term acquisition.

6.4 Pedagogical Implications

Although the present research study was not conducted in a real-world classroom situation, the findings provide several pedagogical implications that could be useful for L2 writing teachers.

First, the findings that CF improved accuracy not only in revision tasks but also in new pieces of narratives written one week after the learners' received CF suggest that CF is valuable in improving L2 learners' written accuracy. Therefore, L2 writing teachers can help learners' improve their written accuracy by utilizing CF in writing. In particular, teachers can consider utilizing comprehensive CF as it was proved to be effective in short-term accuracy gains in intermediate level L2 learners' writings. Before this present study, Van Beuningen et al. (2012) also demonstrated the effectiveness of comprehensive CF in gaining accuracy in new writing. Previous studies that found long-term effects of CF, all explored the effects of focused CF (i.e., CF targeting specific errors, e.g., Bitchener, 2008; Bitchener & Knoch, 2008; Bitchener & Knoch, 2009a; Bitchener & Knoch, 2009b; Bitchener & Knoch, 2010b; Ellis et al., 2008; Sheen, 2007; Sheen, 2010b). However, the practical applicability of the findings from these studies was questioned by some scholars (e.g., Ferris, 2010; Storch, 2010) as the main aim of the teachers is to help learners improve the overall accuracy of the writing. From this point of view, comprehensive CF has been claimed to be more authentic CF (e.g., Ferris, 2010; Hartshorn et al., 2010; Storch, 2010; Van Beuningen, 2011). The finding of the present study that comprehensive CF (an authentic CF method) led to L2 acquisition in new writings (although short-term) could be very encouraging to L2 writing teachers.

The second implication relates to the finding that both direct and indirect comprehensive CF (in the forms of underlining and underlining in combination with metalinguistic information) demonstrated significant effects in reducing errors in revision tasks. Allowing and encouraging learners' to revise their writings based on provided CF could help them foster SLA and increase writing proficiency. Referring to Lowen (2004),

Van Beuningen (2011) also pointed out that making learners revise their texts could foster SLA because production of correct forms might help learners automatize their L2 production. She further added that in Swain's (1985; 2005) view, production of accurate revisions could be considered an indication of pushed output, "and should therefore be expected to promote L2 acquisition by triggering noticing (the gap) and hypothesis testing" (Van Beuningen, 2011; p. 137). Learners in the present study were significantly successful in reducing errors in the three revisions, which can be thus considered as an indication of pushed output. In the prompted recall interview, the participants in the Underline only CF and Underline+metalinguistics CF group also mentioned that underlining of the errors helped them notice the errors, think about those, and in many cases enabled them to successfully correct some errors. Underline+metalinguistic CF was also successful in gaining accuracy in a new writing produced one week after they received CF. Learner responses and the success of Underline+metalinguistic CF group in gaining accuracy in new writing in the present study thus lend support to Swain's (1985; 2005) assertion that revision accuracy might be an indication of pushed output and it could promote L2 acquisition by triggering noticing the gap and hypothesis testing.

The findings of the present study (i.e., learners demonstrated improvement in accuracy in new writing tasks from Direct CF and Underline+metalinguistic CF) also demonstrated that comprehensive CF is not only a valuable editing tool, it can also foster learning. Revision tasks could also help learners improve their writing proficiency, especially for those who are still trying to learn writing or becoming proficient writers. It is thus vital to inform learners about the value of comprehensive CF and revision activities in SLA and writing development. As Amrhein and Nassaji (2010) have pointed

out, teachers need to openly discuss the use of written CF with learners and make sure that they understand the purpose of error correction. Learners also need to be motivated by their teachers to engage with the CF provided to them as “the potential beneficial roles of CF-based revision are not served when learners misperceive its goals” (Van Beuningen, 2011), and also that learners’ attitude and motivation towards CF might influence the success of involvement with CF (Storch, 2010; Storch & Wigglesworth, 2010; Swain & Lapkin, 2002).

The third pedagogical implication can be drawn from the relative effectiveness of Direct and indirect CF (i.e., Underline+metalinguistic CF) in the present study. It was found that Direct CF was successful in short-term grammatical accuracy gains (in new writing produced one week after the treatment), and this finding thus contradicts Truscott’s (1996) claim that error correction might lead to improved accuracy of non-grammatical features. It was argued earlier that direct CF was successful with the participants of this present study as it provided the kind of efficient and explicit information necessary for these learners. This study took it for granted that learners’ level was intermediate on the basis of the placement tests of the two ESL schools that they were recruited from. In the present research, participants’ actual level might have been lower than intermediate or not appropriate for successfully utilizing the indirect CF or fully benefit from it (please see section 6.5 for further discussion). However, although Direct CF was more successful in reducing grammatical errors in this study, L2 teachers should not be encouraged to use direct CF only. In most cases, direct CF may be very useful to beginner level learners, which was also pointed out by learners of the present study during the stimulated recall interview. When learners become more independent

and achieve the ability to self-correct, teachers may utilize more indirect CF like Underlining only and Underline+metalinguistic CF. Thus, both direct and indirect feedback needs to be utilized by carefully considering the types of error that are targeted, level of the learners, and goals with the writing practice. As Van Beuningen (2011) also pointed out, direct and indirect CF can complement each other as well.

The findings from the qualitative study in the present research also demonstrated that all the participants in all four groups mentioned they believe CF is useful to become proficient writers. This finding confirms Ferris's (1999) observation that learners like to be corrected in order to improve their grammatical accuracy, and she regarded this preference as a further argument in favor of correction in L2 writing. L2 teachers, therefore, may find learners' preference for error correction encouraging.

It was also found from the interview responses of the present study that majority of the learners preferred Underline+metalinguistic CF as the most effective. Learners' preference for Underline+metalinguistic CF method was reflective of the finding of the quantitative analysis in that only the indirect CF displayed a short-term positive effect in increasing overall accuracy in a new piece of writing. This finding demonstrated that learners may utilize the CF treatment that is provided to them better if it matches their expectation. L2 teachers may consider exploring learners' expectations and meeting their expectations regarding different types of written CF. As Amrhein and Nassaji (2010) also asserted, Leki (1991) pointed out that ignoring students' expectations may de-motivate students (Leki, 1991). However, learners' proficiency levels, individual differences and needs for different types of CF, as well as goals with writing might influence the relative success of different CF treatments. Considering these factors, L2 writing teachers may try

finding out learners' preferences for CF types and explore the success of that particular CF type. Nevertheless, as pointed out by Amrhein and Nassaji (2010), research (e.g., Cohen & Cavalcanti, 1990) indicates that students' preferences and expectations are often influenced by their prior language learning experiences, which may not necessarily have been beneficial. Therefore, Amrhein and Nassaji (2010) add, teachers need to demonstrate and explain the use of effective types of CF for learners, including those types which are initially not preferred by them, and they also may need to shift learners' expectations to the CF that will be more beneficial for them. Furthermore, "it is important that teachers bear in mind the complexity of learning and make decisions not only based on students' expectations, but also on other factors that can influence the effectiveness of feedback" (Amrhein and Nassaji, 2010; p. 117).

6.5 Limitations and Implications for Future Research

Although, the present research study has its strengths, it still has some flaws with regard to the research design and research instruments used. First, in terms of the setting of the current study, the study did not take place in a real-world classroom context. CF treatments were provided after the regular class hours, therefore it cannot be concluded that the findings of the present research would be reflective of real-world classroom situations. Therefore, a replication study using the same design in a real-world classroom setting would draw more authentic results and could be generalized.

The present research context is consistent with other recent studies that investigated the effectiveness of written CF (e.g., Bitchener, 2008; Bitchener & Knoch, 2008, 2009a, 2009b; 2010b; Ellis et al., 2008; Sheen, 2007; Sheen, 2010b, Truscott &

Hsu, 2008) with regards to the age and the level of L2 proficiency. However, the fact that the present research did not include a language proficiency test to evaluate if the participants were really intermediate level or not, could be another drawback. The participants were recruited from intermediate level classrooms of two ESL schools in Canada, believing the placement tests of those schools were accurate. However, as we know, the placement tests might not be fully accurate all the time. The error rate in the initial writing task demonstrated that the learners who participated in the present study were not equal in terms of their level of L2 proficiency. This unequal English proficiency of participants might have affected the findings of the present study in that indirect CF was not successful in significantly improving both short-term and long-term accuracy in writing tasks. Underline only and Underline+metalinguistic CF might have posed higher level cognitive demand on learners in the current research to process CF, which a majority of them did not possess. Thus, due to lack of sufficient L2 proficiency, the learners' could not achieve long-term acquisition despite receiving treatment three times. The interview data from the qualitative study of the present work also demonstrated that a majority of participants identified indirect CF as not very useful for them since they could not figure out the nature and type of errors they made, and also that they did not have sufficient grammatical and lexical knowledge to correct certain errors from this CF. As a result, due to lower level metalinguistic awareness, learners failed to fully benefit from indirect CF in the present study. A replication study using the same design with properly tested intermediate level language proficiency learners would produce different and more credible result with regard to the effectiveness of comprehensive CF in increasing accuracy in L2 writing.

Another limitation with regards to research context would be that although the research took place in an ESL classroom, almost all the participants were basically from EFL educational and cultural backgrounds. The majority of them also indicated in their background information that their goal was to go back to their home countries after finishing the ESL studies in Canada. This fact might also have impacted the findings of the present research (i.e., there was both accuracy gains and declines in three CF groups in new writings, and also there was no transfer effect of CF in the delayed writing). We also know that learners' goals with writing proficiency or success in writing vary significantly in ESL and EFL contexts. The learners' who participated in the present study most probably were studying in their native language in various disciplines at the university level and, thus, their English writing tasks might have been limited or very content-oriented. Therefore, even though a majority of the participants in the present study indicated during the interview that CF treatment is very important for writing proficiency, and that they found the CF they received very useful to correct errors, there was a mismatch between their expressed usefulness or effectiveness of CF and their actual needs for success in English writing. In other words, unlike in ESL contexts, a very high level of proficiency in English writing is not a huge requirement to achieve the academic goals in EFL countries (unless learners are studying in an English medium educational setting), and therefore the participants were probably not highly motivated in improving their English writing skills in Canada. It was also possible that as their main focus was to improve their English speaking skills in an English speaking country (please see section 3.3 for an account on participants), they did not fully dedicate themselves in improving their accuracy or proficiency in writing despite their participation in the

present study. Furthermore, as the present researcher was not the instructor of the participants, they might not have taken CF seriously, and thus, the receptivity of CF was less. Further studies using participants from ESL backgrounds, whose goal is to go to English speaking universities, needs to be conducted to get a clear understanding of the effectiveness of comprehensive CF in improving written accuracy in intermediate level ESL students' writing.

In terms of the design of the present study, one might question that there was only a two-week gap between the 3rd writing (written text learners produced after the last treatment) and the final new narrative learners produced (i.e., the gap between post-test and delayed post-test to find out long-term improvement in accuracy from CF). Findings from a new writing after only a two-week gap or interval would not be sufficient to claim any significant long-term accuracy gain. Thus, this limited gap to investigate long-term acquisition or improvement could be considered as a weakness of this study. However, most of the learners, who participated in the present study, were in Canada for a period of 6-7 weeks (as the ESL courses they were enrolled in lasted only 6 weeks). Due to this practical reason the present researcher had to conduct the present study with this 6-week-long research design. Further studies using similar design (i.e., providing CF treatment more than one time), but using a longer gap between the post-test and the delayed post-test or adding another delayed post-test after two weeks, would yield interesting findings.

As mentioned earlier, the result of the present study did not demonstrate delayed learning effects from both direct and indirect CF types despite the fact that unlike some recent influential research that investigated the effectiveness of comprehensive written CF (e.g., Truscott & Hsu, 2008; Van Beuningen, De Jong & Kuiken, 2012), the present

work provided CF treatments three times to the learners to get used to the type of CF they received. Not finding delayed improvement in accuracy or learning effects from CF might have resulted from the impact of the writing tasks used in the present study. Four different pictures were used as prompts to help participants write four new narratives. As far as the level of difficulty is concerned, the tasks were designed to be as similar as possible. However, there is a possibility that participants might have found some of the tasks difficult. As the prompted stimulated recall interview did not include a question to find out information on task difficulty, this can be considered another limitation of the present study. The assumption that participants might have found some tasks difficult is supported by the finding of the present study that different narratives produced different results, i.e., while Direct CF was successful in increasing grammatical accuracy in Writing 2, Underline+metalinguistic CF was successful in increasing overall accuracy in Writing 3. It is generally presumed that learners' can utilize the knowledge in the new writing tasks that they gained from the first writing task (Bruton, 2009a). But as pointed out by Van Beuningen (2011), it is not certain if learners really can utilize the knowledge they gained from CF on a particular piece of writing in a new text, and it might be also that "participants received corrections on features that they were unable to reuse when writing a new text" (Van Beuningen, 2011). Further qualitative research using think-aloud protocol analysis would be useful in exploring learners' reactions towards the writing tasks and the possible ways they utilize knowledge from the CF on a previous writing task to a new one.

In addition, another limitation of the study, which might have affected the result of the present study, is the genre of writing task, i.e., the use of narrative writing tasks for

all four writing tasks. Participants in the present study were all adult learners with diverse university level educational backgrounds. Their goals within the English program they were attending also varied. All learners might not have equally appreciated the narrative writing tasks or found them authentic. It would be interesting to replicate the present study using more authentic or real-life tasks in a real-world classroom setting with appropriate intermediate level learners to test the generalizability of the present findings.

Finally, although this study undertook the much needed initiative to investigate learners' perceptions and attitudes towards direct and two indirect CF (Underline only and Underline+metalinguistic CF) and their relative effectiveness in correcting grammatical and non-grammatical errors by interviewing participants at the end of the study using a stimulated recall interview, adding a think-aloud protocol during revision tasks would produce more practical and valuable data. In that way, learners' internal processes during error correction or the psychological processes that they undergo while attending to each type of error based on CF treatment could be appropriately documented.

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APPENDIX 1: PARTICIPANT CONSENT FORM

Participant Consent Form

You are invited to participate in a study related to a project entitled “An empirical investigation into the effects of direct and indirect feedback on English-as-a-second-language students' writing”, that is being conducted by Khaled Karim.

Khaled Karim is a PhD candidate in the department of Linguistics at the University of Victoria and you may contact him if you have further questions by phone (250-857-2107) or by email (khaledk@uvic.ca).

As a graduate student, I am required to conduct research as part of the requirements for a PhD degree in Linguistics. It is being conducted under the supervision of Dr. Hossein Nassaji. You may contact my supervisor at 250.721.7432 or email him at nassaji@uvic.ca.

The purpose of the study is to examine the effectiveness of corrective feedback on second language learning among adult ESL learners. Research of this type is important because it helps us find out what kind of feedback is most effective for L2 learning.

You are being asked to participate in this study because you are an adult ESL learner.

If you agree to voluntarily participate in this research, you will be asked to fill out a background questionnaire, write and revise four essays, and participate in communicative interactions (informal interview) with the researcher. All the writing tasks and the interview will take place in your school after the regular class hours. Note that, this study will be conducted over the period of 6 weeks and the following procedure will be used:

Week 1:

Day 1- Writing essay 1: 30 minutes

Day 2- Revising essay 1: 40 minutes

Week 2:

Day 1- Writing essay 2: 30 minutes

Day 2- Revising essay 2: 40 minutes

Week 3:

Day 1- Writing essay 3: 30 minutes

Day 2- Revising essay 3: 40 minutes

Week 6:

Writing a new essay : 30 minutes

Some of you will be selected to participate in an informal interview with the researcher after revision task in week 3, which will last around 45 minutes. The selected students will be personally contacted by the researcher. Participation in this interview will be completely voluntary.

With your permission, your written essays will be collected for further analysis. With your permission, your interaction will be audio-recorded, which will be later transcribed for analysis.

There are no known or anticipated risks to you by participating in this research. The potential benefits of your participation in this research include the feedback you get while doing the writing tasks and its possible effects on improving your writing skills. Your participation in this research must be completely voluntary. The data collected from you in this research will be kept strictly anonymous. They will be aggregated and your names will not appear in any reports, publications, or presentations resulting from this study.

You should note that your participation does not affect in any ways your school grades. Also, for the data analyses, all names will be removed and the data will be kept completely anonymous.

As the data will be collected over a period of 6 weeks, your continuous participation is very important for this research study. To make sure that you continue to consent to participate in this research, you will be reminded before every writing task and before the interview that your participation in those tasks is voluntary and that you can withdraw at any time during the research without any consequences or explanation.

The potential risks to you by participating in this research may include tiredness or fatigue. To prevent or to deal with the risk, you will be given breaks any time you wish. If you feel too tired to continue your participation, you can decide to postpone or withdraw from the research. Your participation in this research must be completely voluntary. If you do decide to participate, you may withdraw at any time without any consequences or any explanation. If you do withdraw from the study your data will be used in my analysis only if you give me permission. Your initials in the following blank, _____, indicate that you permit me to use your data after your withdrawal.

It is anticipated that the results of this study will be shared with others in the form of conference presentations and publications. With your permission, I plan to keep the data set in an anonymized form for possible future analysis and research on the role of corrective feedback.

In addition to being able to contact the researcher at the above phone number or email, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Human Research Ethics Office at the University of Victoria (250-472-4545 or ethics@uvic.ca).

Your signature below indicates that you understand the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researchers. Your signature also indicates that you consent to be audio-taped while participating in the interview, and also to collect and use your written and revised essays as data for further analysis.

Name of Participant

Signature

Date

(A copy of this consent will be left with you, and a copy will be taken by the researcher.)

APPENDIX 2: LETTER OF PERMISSION TO COLLECT DATA FROM SCHOOL

Director of Academic affairs
X School
Victoria, BC

Sub: Request for permission to collect data

Dear Ms. Y,

I am a PhD candidate in Linguistics at the University of Victoria and am interested in pursuing an investigation into the effectiveness of direct and indirect feedback in second language (L2) students' writing development for my PhD dissertation. The title of my proposed study is: "An empirical investigation into the effects of direct and indirect feedback on English-as-a-second-language students' writing". I am writing to seek your permission to collect data for my research project in your school.

The target participants are intermediate level students. In particular, I intend to investigate intermediate students' perspectives on direct and indirect feedback, and the effects of these two types of corrective feedback on reducing errors in their writing over a period of 6 weeks. For this investigation, the desired number of participants is 60 adult ESL intermediate students. With your permission I will approach the intermediate level students in your school to participate in my study. Data will be collected after the regular class hours. I would also request you to allow me to use one of the classrooms of your school to do the data collection (i.e. writing tasks and interview sessions).

The form of the data collection would require writing three essays from picture cues (30 minutes each), revising those three essays (40 minutes each) in three weeks, and writing a new essay (30 minutes) on week 6. At the end of the revision session on week three, 16 selected students will be interviewed by me as an effort to find out their attitudes and perspectives on feedback and error correction. For one session of the interview each participant will require to spend about 45 minutes.

As the data will be collected after the regular class hours, I believe, it will cause very little inconvenience to the daily operation of the whole school. The potential benefits of students' participation in this research include the feedback they receive while doing the writing tasks and its possible effects on improving their writing skills. I would also like share the findings with the teachers of your school and conduct a free workshop for them and the students regarding the benefit of corrective feedback.

The student participation would be completely voluntary. To make sure that the students continue to consent to participate in this research, they will be reminded before every writing task and before the interview that their participation in those tasks is voluntary and that they can withdraw at any time during the research without any consequences or explanation. I would at all stages follow the guidelines of the University of Victoria's

research ethics committee, including informed consent of participants and anonymity of data.

I request you to kindly grant me permission to approach the students of your school to participate in my research study. I appreciate your support in my research project and thank you in advance.

Looking forward to a favorable response.

Sincerely,

Khaled Karim
PhD Candidate in Linguistics
University of Victoria, BC
Tel: (250) 857.2107
E-mail: khaledk@uvic.ca

APPENDIX 3: STUDENT BACKGROUND QUESTIONNAIRE

1. Date: _____
2. Name: _____
3. Gender: a. Male b. Female
4. Age: _____
5. I was born in _____ (name of the country)
6. First language: _____
7. Other language(s) I speak: _____
8. I was _____ (age) when I started learning English.
9. I have lived in Canada for _____ year(s) and _____ month(s).
10. I have studied in this language program for _____ month(s).
11. I have learned English in my country for _____ year(s) and _____ month(s).
12. I think my English level is
 - a. Beginner
 - b. Low intermediate (Low-middle)
 - c. Intermediate (Middle)
 - d. Advanced (High)
13. I have finished
 - a. High school
 - b. College
 - c. University
 - d. Other-----
14. I have taken ESL writing course before? Yes No
15. I am currently taking ESL writing class/course. Yes No
16. I study English in this program because
 - a. I want to go to university in Canada/ the United States.
 - b. I want to improve my English skills in an English-speaking setting.
 - c. Other
(Please tell us) _____

Thank you!

APPENDIX 4: STIMULATED RECALL INTERVIEW QUESTIONNAIRE

Stimulated Recall Interview Questionnaire

1. You have made changes here correctly (or corrected successfully) from the feedback provided by the researcher. Could you please tell me what helped you to change (or correct)?
2. You have not made any changes/correction here (or could not correct successfully) from the feedback provided by the researcher. Could you please tell me why?
3. This is an example of a grammatical error (the researcher will point out the error). Was it easy or difficult for you to correct this (or this type of) error? Why or why not?
4. This is an example of a lexical error (the researcher will point out the error). Was it easy or difficult for you to correct this (or this type of) error? Why or why not?
5. Overall, was the type of feedback you received useful to you to correct the errors? Why or Why not?
6. You have received feedback three times on different types of errors that you made in your three writing assignments. Do you think you will make the same errors again in the future in a new writing assignment?
7. Do you think feedback is useful for you to become a proficient writer? If yes, which types of feedback do you think is most useful in your opinion and why? (The researcher will show examples of direct and indirect feedback) If 'No', why?

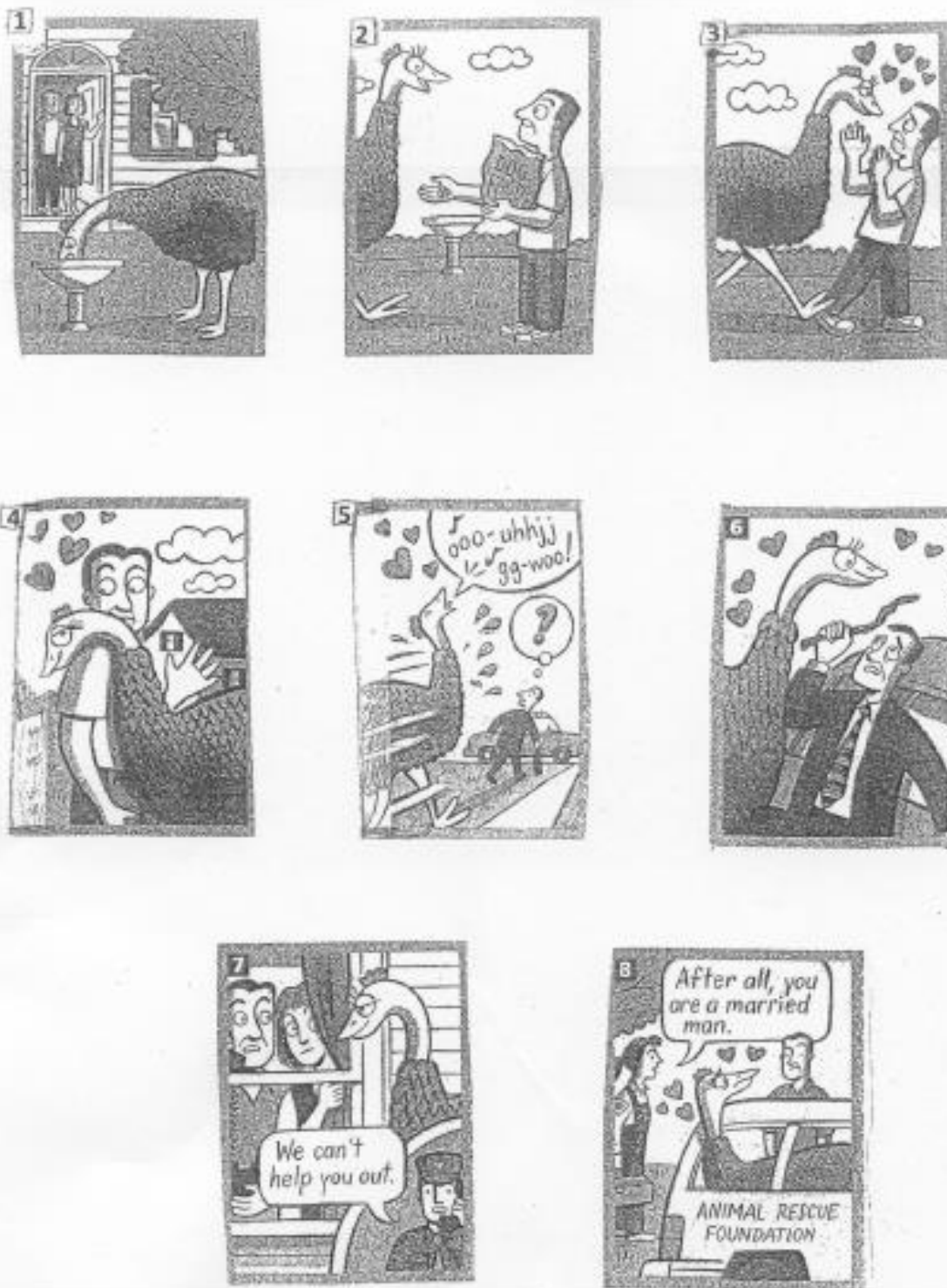
APPENDIX 5: INTERVIEW QUESTIONNAIRE FOR CONTROL GROUP

Interview Questionnaire: “NO CF” Group (Control)

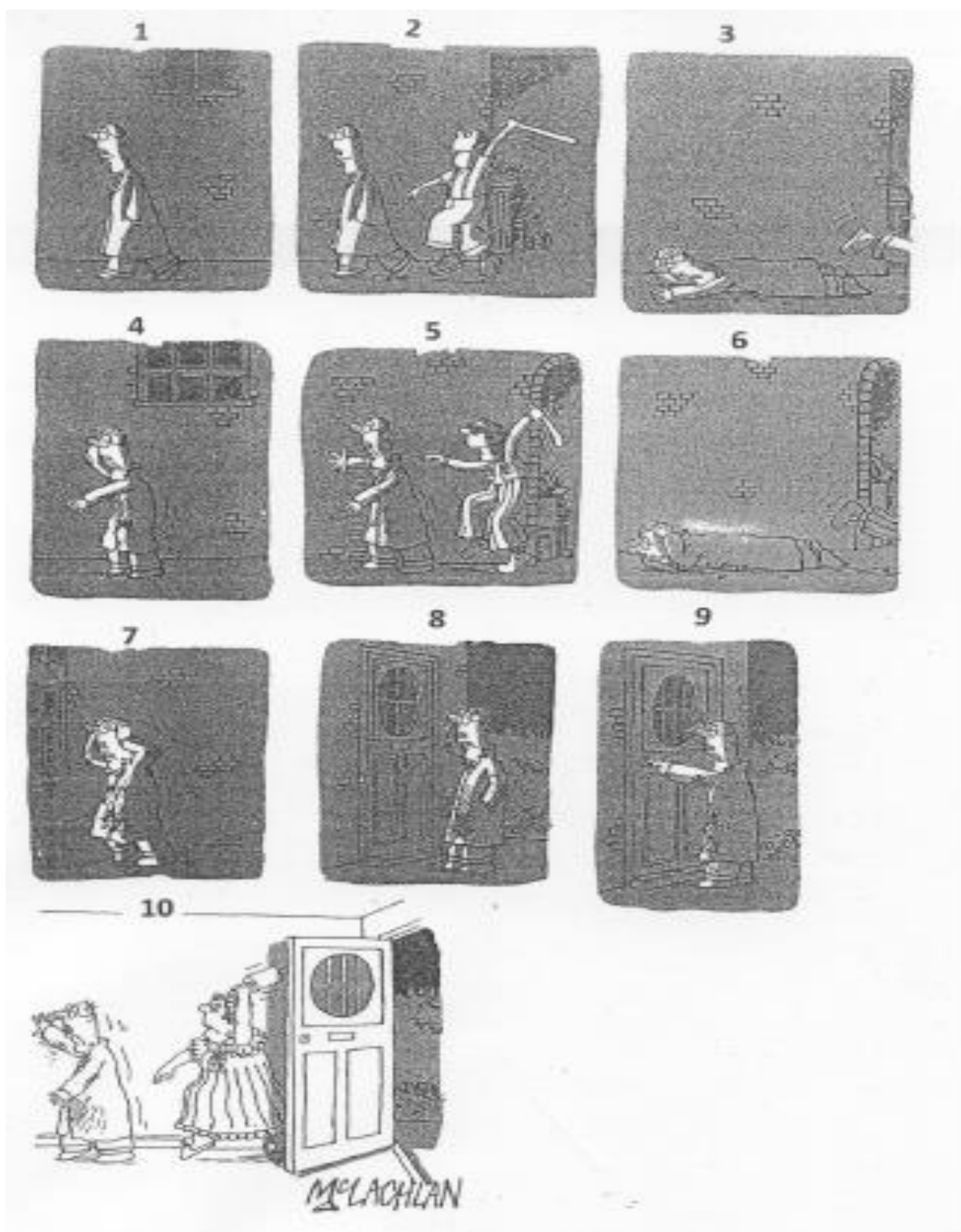
1. Was self-correction useful for you to correct errors in your writing? Why? or Why not?
2. Do you think self-correction can help improve your writing proficiency? Why? or Why not?
3. If you received feedback, which method of feedback would be the most useful for you to improve accuracy in your writing (researcher will show examples)? Why?

APPENDIX 6: WRITING TASKS

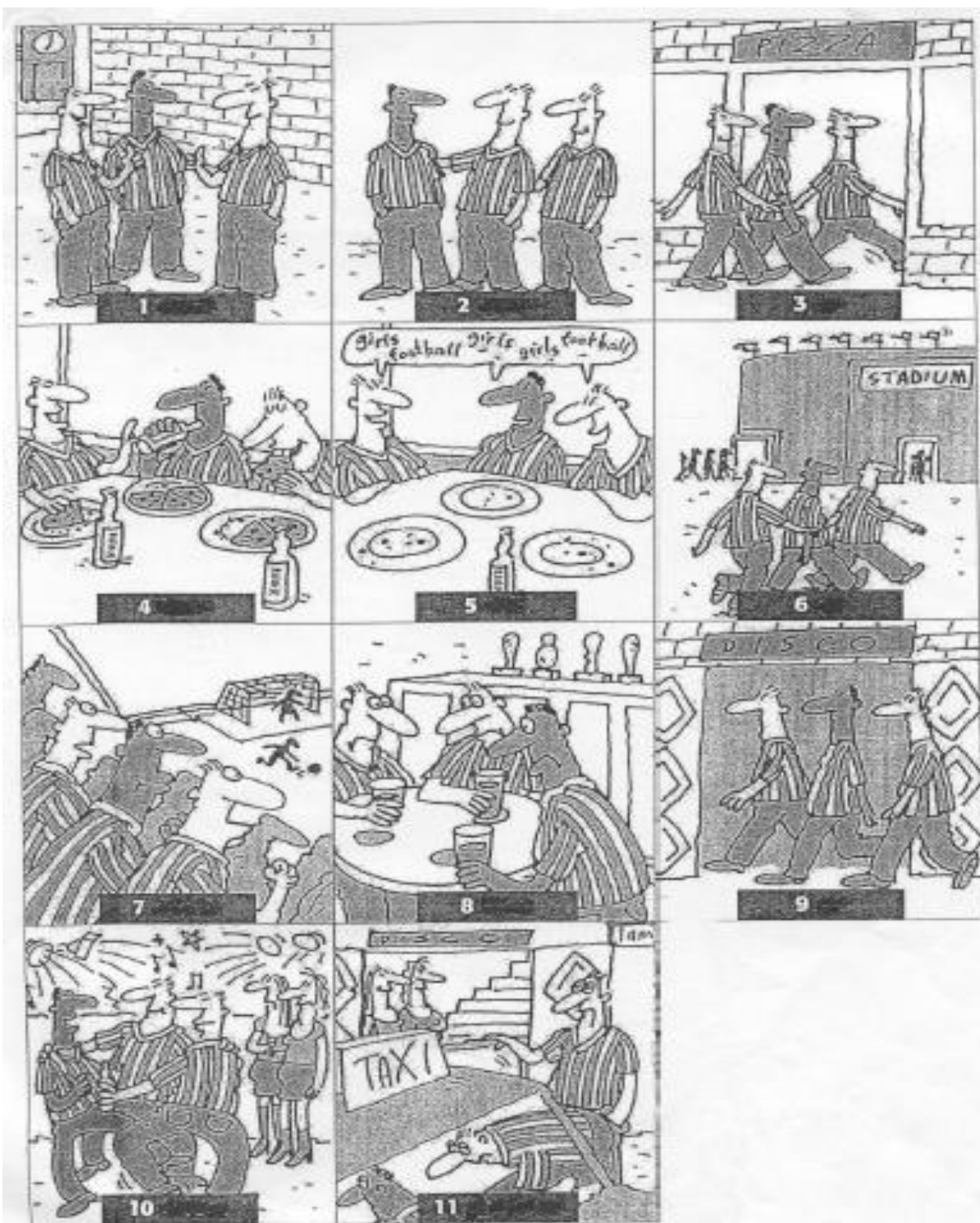
PICTURE PROMPT 1



PICTURE PROMPT 2



PICTURE PROMPT 3



PICTURE PROMPT 4

