

The effectiveness of written CF for L2 development:
A mixed-method study of written CF types, error
categories and proficiency levels

Qi Guo

Handwritten Chinese characters for the author's name, Qi Guo.

A thesis submitted to
Auckland University of Technology
in fulfilment of the requirements for the degree of Doctor of
Philosophy (PhD)

2015

School of Language and Culture

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

In the Name of Allāh, the Most Gracious, the Most Merciful

TABLE OF CONTENTS

ABSTRACT	xiii
ATTESTATION OF AUTHORSHIP	xv
ACKNOWLEDGEMENTS	xvi
SPECIAL ACKNOWLEDGEMENTS	xvii
CHAPTER 1	1
INTRODUCTION	1
1.1 Introduction	1
1.2 Written CF research and theoretical explanations.....	3
1.2.1 Does written CF enable learners to use targeted linguistic types more accurately in new writing tasks over time?.....	3
1.2.2 Are some types of written CF more effective than others?	5
1.2.3 Is written CF more effective for some linguistic types than others?	6
1.2.4 Does the proficiency level of a learner have an impact on the effectiveness of written CF?	7
1.2.5 Does no immediate improved accuracy mean that written CF is ineffective?.....	8
1.2.6 Does scaffolded written CF better facilitate improved accuracy?.....	9
1.3 The overall focus and design of this thesis.....	9
1.4 Thesis outline	10
CHAPTER 2	12
THEORETICAL EXPLANATIONS OF THE EFFECTIVENESS OF WRITTEN CF FOR L2 DEVELOPMENT	12
2.1 Introduction	12
2.2 An overview of L2 learning	13
2.3 Cognitive processing account of SLA and the role of written CF	14
2.3.1 Theoretical explanations of the effectiveness of written CF	16
2.3.1.1 The effectiveness of written CF for the development of explicit knowledge	16
2.3.1.2 The effectiveness of written CF on knowledge consolidation	21

2.3.2 Theoretical explanations of the differential effectiveness of written CF types	23
2.3.3 Theoretical explanations of the differential effectiveness of written CF types for treating different linguistic error types	25
2.3.4 Theoretical explanations of the moderating role of proficiency level ..	27
2.3.5 Summary of the theoretical explanations of the effectiveness of written CF in cognitive information processing.....	28
2.4 Interactionist account of SLA and scaffolded written CF	29
2.4.1 Interaction Hypothesis	29
2.4.2 Scaffolding and scaffolded written CF	31
2.5 Summary	33
CHAPTER 3	34
A REVIEW OF WRITTEN CF STUDIES	34
3.1 Introduction	34
Part A Quasi-experimental studies	35
3.2 Studies on whether or not written CF can facilitate improved accuracy....	35
3.2.1 Revision studies	36
3.2.2 New text studies.....	38
3.2.2.1 Unfocused new text studies.....	38
3.2.2.2 Focused new text studies.....	44
3.2.2.3 Studies comparing unfocused and focused written CF.....	47
3.3 Studies on whether or not the effect of written CF varies according to different degrees of explicitness	48
3.3.1 Studies comparing direct correction and direct correction plus metalinguistic explanation	48
3.3.2 Studies comparing metalinguistic explanation and other written CF types.....	51
3.4 Studies on whether or not the effect of written CF varies according to linguistic types.....	54
3.5 Studies on whether or not the effect of written CF is moderated by other factors	56
3.5.1 Instructional context and the effect of written CF	57
3.5.2 Individual factors and their effect on written CF.....	58
Part B Scaffolded written CF studies	60

3.6 The effect of scaffolded written CF: Aljaafreh & Lantolf's (1994) study ..	61
3.7 A comparison of scaffolded written CF and random written CF: Nassaji & Swain's (2000) study.....	62
3.8 A comparison of scaffolded written CF and highly explicit written CF: Erlam et al.'s (2013) study	63
3.9 Rationale of the present study and research questions	65
CHAPTER 4	67
METHODOLOGY	67
4.1 Introduction	67
4.2 Methodological approach	67
4.3 The main study	69
4.3.1 Setting	69
4.3.2 Participants.....	70
4.3.3 Study design.....	70
4.3.4.1 Regular and irregular past tense	72
4.3.4.2 Prepositions indicating space	73
4.3.5 Instruments.....	74
4.3.6 Treatments	74
4.3.7 Data collection Procedures	78
4.3.7.1 Pre-test (week 1)	78
4.3.7.2 Treatment (week 3)	78
4.3.7.3 Immediate post-test (week 3).....	78
4.3.7.4 Delayed post-test 1 (week 7).....	79
4.3.7.5 Delayed post-test 2 (week 19).....	79
4.3.8 Data analysis	79
4.3.9 Study validity and reliability.....	81
4.4 Follow-up multiple case study.....	83
4.4.1 Setting	83
4.4.2 Participants.....	84
4.4.3 Study design.....	84
4.4.4 Targeted structures.....	86
4.4.5 Instruments.....	86
4.4.6 Treatment	86

4.4.7 Data collection procedures.....	87
4.4.7.1 One-on-one intervention (week 9)	87
4.4.7.3 Long-term effect test (week 19).....	89
4.4.8 Data analysis	89
4.4.9 Validation and reliability	92
4.4.10 Ethical considerations	93
CHAPTER 5	94
MAIN STUDY: RESULTS AND DISCUSSION	94
5.1 Introduction	94
5.2 <i>Does written CF enable Chinese EFL learners to use targeted linguistic types more accurately in new writing tasks over a period of four months (RQ1)?</i>	95
5.3 <i>Is the effectiveness of written CF dependent upon its degree of explicitness (underlining, error code, metalinguistic explanation, direct correction, direct correction plus metalinguistic explanation) (RQ2)?</i>	103
5.4 <i>Is written CF more effective in targeting certain linguistic errors (regular past tense, irregular past tense and prepositions indicating space) (RQ3)?</i> ..	104
5.4.1 The effectiveness of written CF on regular past tense.....	105
5.4.2 The effectiveness of written CF on irregular past tense	108
5.4.3 The effectiveness of written CF on prepositions indicating space	113
5.5 <i>Does the proficiency level (higher and lower) of Chinese EFL learners determine how effective written CF is for improving the accuracy of (a) regular past tense, (b) irregular past tense and (c) prepositions indicating space in new writing tasks over a period of four months (RQ4)?</i>	117
5.5.1 The effect of proficiency level on the use of written CF on regular past tense..	117
5.5.2 The effect of proficiency level on the use of written CF on irregular past tense.....	118
5.5.3 The effect of proficiency level on the use of written CF on prepositions indicating space.....	120
5.6 Conclusion.....	123
CHAPTER 6	125
CASE STUDIES: RESULTS AND DISCUSSION	125
6.1 Introduction	125

6.2 <i>To what extent does no accuracy improvement in the immediate post-test mean that one session of written CF treatment has been not beneficial for Chinese EFL learners (RQ5)?</i>	126
6.2.1 Case study 1: Helen from Underlining Group.....	126
6.2.1.1 Quantitative analysis	126
6.2.1.2 Qualitative analysis	127
6.2.1.2.1 Irregular past tense	128
6.2.1.2.2 Prepositions indicating space	130
6.2.2 Case Study 2: Mary from Error Code Group.....	132
6.2.2.1 Quantitative analysis	132
6.2.2.2 Qualitative analysis	133
6.2.3 Case Study 3: Sue from Metalinguistic Explanation Group.....	136
6.2.3.1 Quantitative analysis	136
6.2.3.2 Qualitative analysis	136
6.2.3.2.1 Regular past tense.....	137
6.2.3.2.2 Irregular past tense	139
6.2.3.2.3 Prepositions indicating space	140
6.2.4 Case Study 4: Shirley from Direct Correction Group.....	141
6.2.4.1 Quantitative analysis	141
6.2.4.2 Qualitative analysis	142
6.2.4.2.1 Regular past tense.....	142
6.2.4.2.2 Irregular past tense	143
6.2.4.2.3 Prepositions indicating space	144
6.2.5 Case Study 5: Anna from Direct Correction plus Metalinguistic Explanation Group.....	145
6.2.5.1 Quantitative analysis	145
6.2.5.2 Qualitative analysis	146
6.2.5.2.1 Irregular past tense	146
6.2.5.2.2 Prepositions indicating space	147
6.2.6 Summary and discussion of the findings of RQ5	148
6.2.6.1 One session of written CF treatment for regular past tense	148
6.2.6.2 One session of written CF treatment for irregular past tense.....	151

6.2.6.3 One session of written CF treatment for prepositions indicating space.....	152
6.2.6.4 Final remarks.....	153
6.3 <i>To what extent does the provision of scaffolded written CF facilitate improved accuracy for Chinese EFL learners who failed to benefit from a single written CF treatment (RQ6)?</i>	155
6.3.1 Case study 1: Helen from Underlining Group.....	155
6.3.1.1 Scaffolded written CF for Helen.....	155
6.3.1.2 The immediate effect of scaffolded written CF	159
6.3.1.3 The effect of scaffolded written CF over 10 weeks' time.....	161
6.3.2 Case Study 2: Mary from Error Code Group.....	164
6.3.2.1 Scaffolded written CF for Mary.....	164
6.3.2.2 The immediate effect of scaffolded written CF	167
6.3.2.3 The effect of scaffolded written CF over 10 weeks' time.....	169
6.3.3 Case Study 3: Sue from Metalinguistic Explanation Group.....	171
6.3.3.1 Scaffolded written CF for Sue.....	171
6.3.3.2 The immediate effect of scaffolded written CF	174
6.3.3.3 The effect of scaffolded written CF over 10 weeks' time.....	176
6.3.4 Case Study 4: Shirley from Direct Correction Group.....	178
6.3.4.1 Scaffolded written CF for Shirley	178
6.3.4.2 The immediate effect of scaffolded written CF	181
6.3.4.3 The effect of scaffolded written CF over 10 weeks' time.....	184
6.3.5 Case study 5: Anna from Direct Correction Plus Metalinguistic Explanation Group.....	187
6.3.5.1 Scaffolded written CF for Anna.....	187
6.3.5.2 The immediate effect of scaffolded written CF	189
6.3.5.3 The effect of scaffolded written CF over 10 weeks' time.....	191
6.3.6. Summary and discussion of the findings of RQ6	193
6.3.6.1 Scaffolded written CF	194
6.3.6.2 The immediate effectiveness of scaffolded written CF.....	195
6.3.6.3 The effectiveness of scaffolded written CF over 10 weeks' time.....	198
CHAPTER 7	201
CONCLUSION	201

7.1 Introduction	201
7.2 Summary of findings	201
7.3 Contributions of this study	205
7.3.1 Contributions to theory	206
7.3.1.1 Key factors in the development of explicit knowledge.....	206
7.3.1.2 Key factors in the controlled processing of explicit knowledge..	209
7.3.1.3 The value of interaction on cognitive processing	211
7.3.2 Contributions to research	213
7.3.3 Pedagogical implications	217
7.4 Limitations of the study.....	218
7.5 Recommendations for future research.....	219
7.6 Final remarks	220
REFERENCES.....	222
APPENDICES	228
Appendix A	228
Appendix B.....	229
Appendix C.....	230
Appendix D	233
Appendix E.....	235
Appendix F.....	236
Appendix G	237
Appendix H	241

LIST OF TABLES

Table 3.1 Revision studies on the effectiveness of written CF.....	36
Table 3.2 Early new text studies and methodological flaws.....	39
Table 3.3 Focused new text studies.....	45
Table 3.4 Studies comparing direct correction and direct correction plus metalinguistic explanation.....	49
Table 3.5 Studies comparing metalinguistic explanation and other written CF types.....	52
Table 4.1 The use of irregular past tense in the pre-test and the immediate post-test	91
Table 4.2 The accurate use of the targeted linguistic types throughout the testing occasions	91
Table 5.1 Mean scores and standard deviations by group and testing period (3 targeted types combined)	95
Table 5.2 Summary of significant differences between treatment groups and the control group in the immediate post-test (3 targeted types combined).....	97
Table 5.3 Summary of significant differences between the pre-test and the delayed post-test 2 (3 targeted types combined)	102
Table 5.4 Mean scores and standard deviations by group and testing period (regular past tense)	105
Table 5.5 Summary of significant differences between the pre-test and the immediate post-test (regular past tense).....	108
Table 5.6 Mean scores and standard deviations by group and testing period (irregular past tense).....	109
Table 5.7 Summary of significant differences between the pre-test and the delayed post-test 2 (irregular past tense)	112
Table 5.8 Mean scores and standard deviations by group and testing period (prepositions indicating space).....	113
Table 5.9 Summary of significant differences between the pre-test and the immediate post-test (prepositions indicating space)	115
Table 5.10 Summary of significant differences between the pre-test and the delayed post-test 2 (prepositions indicating space).....	116
Table 5.11 Mean scores and standard deviations by group, testing period and proficiency level (regular past tense)	118

Table 5.12 Mean scores and standard deviations by group, testing period and proficiency level (irregular past tense).....	119
Table 5.13 Mean scores and standard deviations by group, testing period and proficiency level (prepositions indicating space).....	121
Table 6.1 Helen's accuracy rates of the targeted linguistic types in the pre-test and the immediate post-test	127
Table 6.2 Helen's use of irregular past tense in the pre-test and the immediate post-test	128
Table 6.3 Helen's use of prepositions indicating space in the pre-test and the immediate post-test	130
Table 6.4 Mary's accuracy rates of the targeted linguistic types in the pre-test and the immediate post-test	132
Table 6.5 Mary's use of prepositions indicating space in the pre-test and the immediate post-test.....	133
Table 6.6 Sue's accuracy rates of the targeted linguistic types in the pre-test and the immediate post-test	136
Table 6.7 Sue's use of regular past tense in the pre-test and the immediate post-test	137
Table 6.8 Sue's use of irregular past tense in the pre-test and the immediate post-test	139
Table 6.9 Sue's use of prepositions indicating space in the pre-test and the immediate post-test	140
Table 6.10 Shirley's accuracy rates of the targeted linguistic types in the pre-test and the immediate post-test.....	142
Table 6.11 Shirley's use of regular past tense in the pre-test and the immediate post-test	142
Table 6.12 Shirley's use of irregular past tense in the pre-test and the immediate post-test	143
Table 6.13 Shirley's use of prepositions indicating space in the pre-test and the immediate post-test	144
Table 6.14 Anna's accuracy rates of the targeted linguistic types in the pre-test and the immediate post-test	145
Table 6.15 Anna's use of irregular past tense in the pre-test and the immediate post-test	146
Table 6.16 Anna's use of prepositions indicating space in the pre-test and the immediate post-test	147

Table 6.17 Scaffolded written CF on each of the errors for Helen	157
Table 6.18 Helen's accuracy rates before and immediately after receiving scaffolded written CF.....	159
Table 6.19 Helen's individual use of the targeted linguistic types before and immediately after receiving scaffolded written CF.....	160
Table 6.20 Helen's accuracy rates of the targeted linguistic types throughout testing occasions.....	161
Table 6.21 Helen's individual use of the targeted linguistic types throughout testing occasions.....	162
Table 6.22 Scaffolded written CF on each of the errors for Mary.....	165
Table 6.23 Mary's accuracy rates before and immediately after receiving scaffolded written CF.....	167
Table 6.24 Mary's individual use of the targeted linguistic types before and immediately after receiving scaffolded written CF.....	168
Table 6.25 Mary's accuracy rates of the targeted linguistic types throughout testing occasions.....	169
Table 6.26 Mary's individual use of the targeted linguistic types throughout testing occasions	170
Table 6.27 Scaffolded written CF on each of the errors for Sue.....	173
Table 6.28 Sue's accuracy rates before and immediately after receiving scaffolded written CF	174
Table 6.29 Sue's individual use of the targeted linguistic types before and immediately after receiving scaffolded written CF.....	175
Table 6.30 Sue's accuracy rates of the targeted linguistic types throughout testing occasions	176
Table 6.31 Sue's individual use of the targeted linguistic types throughout testing occasions	177
Table 6.32 Scaffolded written CF on each of the errors for Shirley	181
Table 6.33 Shirley's accuracy rates before and immediately after receiving scaffolded written CF.....	182
Table 6.34 Shirley's individual use of the targeted linguistic types before and immediately after receiving scaffolded written CF.....	183
Table 6.35 Shirley's accuracy rates of the targeted linguistic types throughout testing occasions.....	185

Table 6.36 Shirley's individual use of the targeted linguistic types throughout testing occasions.....	186
Table 6.37 Scaffolded written CF on each of the errors for Anna.....	189
Table 6.38 Anna's accuracy rates before and immediately after receiving scaffolded written CF.....	189
Table 6.39 Anna's individual use of the targeted linguistic types before and immediately after receiving scaffolded written CF.....	190
Table 6.40 Anna's accuracy rates of the targeted linguistic types throughout testing occasions.....	191
Table 6.41 Anna's individual use of the targeted linguistic types throughout testing occasions	192

LIST OF FIGURES

Figure 2.1. Three stages of L2 development.....	15
Figure 2.2. A model of second language acquisition.....	17
Figure 3.1. Regulatory Scale.....	62
Figure 4.1. Design of the main study.	71
Figure 4.2. Design of the follow-up case study.	85
Figure 4.3. The Graduated Written CF Strategies.....	87
Figure 4.4. An episode of scaffolded written CF.....	90
Figure 5.1. Performance over time after written CF provided on combined targeted linguistic types	96
Figure 5.2. Performance over time after written CF on regular past tense	106
Figure 5.3. Performance over time after written CF on irregular past tense.....	110
Figure 5.4. Performance over time after written CF on prepositions indicating space.....	114

ABSTRACT

This thesis contributes to the investigation of the facilitative role of written CF for L2 development. Framed within information processing and interactionist perspectives, this study not only investigated the effectiveness of written CF on learners' improved accuracy, but also explored their responses to written CF with the aim of finding out whether or not, and why, written CF was beneficial or not for L2 development.

This research was conducted with 157 first year university students in Northwest China. They were not majoring in English. A quasi-experimental study was conducted first to examine the differential effectiveness of five types of written CF (underlining, error code, metalinguistic explanation, direct correction and direct correction plus metalinguistic explanation). Additionally, two potential impacting factors on the effectiveness of written CF were investigated: linguistic types (regular past tense, irregular past tense and prepositions indicating space) and learners' proficiency levels (higher and lower). The results suggested that more explicit types of written CF (metalinguistic explanation, direct correction and direct correction plus metalinguistic explanation) facilitated improved accuracy when the three linguistic types were considered as one group; however, the effectiveness was not retained over time. When the three linguistic types were looked at separately, only direct correction was found to facilitate improved accuracy of the irregular past tense immediately after feedback had been given. Although higher proficiency learners produced written texts of a higher accuracy than lower proficiency learners throughout the testing occasions, there was no difference between them with regard to the effectiveness of written CF for treating the targeted linguistic types.

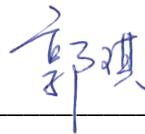
In a follow-up case study, the research focused on two individuals whose accuracy did not improve immediately after receiving various types of written CF. The results of the in-depth analyses of their correct uses and incorrect uses of the targeted linguistic types suggested that less explicit types of written CF may not be explicit enough for learners to produce the correct forms. Thus, it may explain why less explicit types of written CF did not result in the improved accuracy. However, there

was no evidence to show that any type of written CF was ineffective because the errors which had received written CF did not appear again in the subsequent written texts. In addition, scaffolded written CF was provided on each of these learners' targeted linguistic errors. The results showed that scaffolded written CF was more effective in facilitating improved accuracy immediately and over time; however, the explicitness of the written CF needed by each learner on different errors varied even when the errors were from the same linguistic category.

Although the results of the quantitative study did not show statistical significance regarding the moderating role of learners' proficiency levels on the effectiveness of written CF, the results of the case studies revealed that learners in the higher proficiency group required less explicit written CF assistance than the learners in the lower proficiency group who required more explicit written CF assistance, especially on less rule-governed, idiosyncratic and complex linguistic types.

ATTESTATION OF AUTHORSHIP

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

A handwritten signature in blue ink, consisting of the Chinese characters '郭琪' (Guo Qi), written in a cursive style. The signature is positioned above a horizontal line.

Qi Guo

14 August, 2015

ACKNOWLEDGEMENTS

Firstly, my thanks go to my primary supervisor, Professor John Bitchener, for his patience, encouragement and support. He kept me motivated and pushed me to do more than I thought I could ever do. I have learned so much from his extensive expertise and conscientious supervision and this knowledge will surely continue to benefit me in my future career. My thanks also go to my secondary supervisor, Dr. Anne Feryok, for her timely, detailed and much appreciated feedback, particularly with regards to social theories and qualitative research.

I would like to express my gratitude to Dr. Jay Wood, for his invaluable time and patience in helping me analyse the data and finalize the statistical results.

I would like to acknowledge the Auckland University of Technology Ethics Committee (AUTEK) for approving this thesis (Ethics Application Number 11/269) and the Faculty of Culture and Society at AUT for providing me with teaching work and doctoral funding.

My acknowledgement also goes to John Wiley & Sons and Lawrence Erlbaum Associates for their permission to reproduce the figures of their publications in my thesis.

SPECIAL ACKNOWLEDGEMENTS

This thesis would not have been possible without the unfailing support of my family and beloved friends.

Special thanks must go to my father, Xuefeng Guo and my mother, Fuling Lv, who have been missing me, but who still encouraged me to pursue my dreams far away from home for so many years. Thank you, Mum and Dad, for nurturing me into an independent person and making me understand the importance of integrity and knowledge in a unique way.

I am greatly indebted to my husband, Guobin Zhi, who has been supporting me financially and waiting for me patiently. Thank you very much for helping me to realize my dreams and believing in my capability to complete this PhD project.

I also need to express my gratitude to my younger sister, Hui Guo, who has always been there, dealing with my negative feelings and tears.

My great appreciation needs to go to my special friends, Dr. Muhammad Usman and Dr. Zaidah Mustafa (May you rest in peace). Thank you, Usman, for bringing me to ALLAH. Without the faith, it would have never been possible to get through the low points during this tough PhD journey. Thank you, Zaidah, for being such a role model, for being positive and striving for righteousness and goodness. It is so painful to lose you, but you will surely continue to influence me and motivate me to be stronger and better. I really appreciate the existence of both of you in my life and your help in all aspects: academically, mentally, spiritually, emotionally and also financially.

My gratitude is also due to my dear friend, Dr. Stephanie Rummel, for her timely and high-quality proofreading work. Thank you so much for listening to my worries and calming me down by sharing your experience and expertise.

I also want to thank the following individuals for their caring and help of all kinds: Amy Wei, Dr. Jeanie Benson, Xinmei Yang, Yinfang Geng, Zhi Quan, Samira Kakh, Maedeh Tadayyon, Shirley Du and Bingyao Peng.

CHAPTER 1

INTRODUCTION

1.1 Introduction

In language learning, understanding how an L2 (either a second or a foreign language (Ortega, 2009)) is learned has typically been explored in an oral context. How learners' oral productions are affected after the provision of oral corrective feedback (oral CF) has often been investigated to understand L2 development. Oral CF research has generally found that learners' accuracy improved after receiving oral CF, and thus has suggested its effectiveness for L2 development (see a review in Lyster, Saito, & Sato, 2013). In recent times, a number of scholars have indicated that there might be some advantages for L2 learning that occur in a written context. For example, Williams (2012) has argued that writing requires a focus on form that is often not present during speaking. Besides, writing is slower, and thus it provides sufficient time for learners to search for and make use of their L2 knowledge. Reichelt (2001) has further claimed that writing incorporated with written CF (corrective feedback on written product) can draw learners' attention to linguistic forms in their written output and thereby assist L2 acquisition. Furthermore, written CF leaves a permanent record, and the information in written CF may be attended to and referred to more than once. As a result, written CF may have a better and more lasting effect on L2 development than oral CF. However, the effects of written CF have been relatively unexplored.

Written CF research has mainly looked at whether or not learners' written accuracy is likely to improve after the provision of written CF, and a growing number of studies have also looked at whether or not the effect of written CF differs due to different written CF types and when treating different error categories. To date, learners' improved accuracy after receiving written CF has been reported in revision (e.g. Ashwell, 2000; Fathman & Whalley, 1990; Ferris & Roberts, 2001) and new written texts (immediate and over time); and in focused (Bitchener, 2008; Bitchener & Knoch, 2008, 2009b, 2010a, 2010b; Ellis, Sheen, Murakami, &

Takashima, 2008; Sheen, 2007a) and unfocused (Van Beuningen, De Jong, & Kuiken, 2008, 2012) written CF studies. Unfocused written CF studies examine the effect of written CF on treating errors of a wide range of domains and categories (including for example, grammar, words choice and punctuation); while focused written CF studies focus on only one or a few linguistic types. Focused written CF has been reported to be more effective than unfocused written CF (Ellis et al., 2008; Sheen, Wright, & Moldawa, 2009). It has also been reported in focused written CF studies that explicit written CF (e.g., direct correction) is more effective than implicit written CF (e.g., underlining) in treating simple rule-based linguistic error types (e.g., English articles) (Bitchener, 2008; Bitchener & Knoch, 2008, 2009b, 2010a, 2010b; Ellis et al., 2008; Sheen, 2007a). However, there is more that we do not know. For example, does one type of written CF work better in terms of improving accuracy than other types? Is written CF more helpful for one linguistic error type than another? Why does one learner benefit more from written CF than another?

With the aim of making a contribution to some of the areas where questions remain, this thesis explores the potential role of written CF within a cognitive framework. In the cognitive perspective, the ultimate goal of L2 learning is to be able to use L2 knowledge automatically and accurately, without consciousness (DeKeyser, 2007). This kind of knowledge is called *implicit knowledge*. The knowledge which is used with a lot of conscious attention, considering what is accurate and appropriate L2 use is called *explicit knowledge*. According to processing theories and hypotheses (Anderson, 1983, 2000; Gass, 1997; McLaughlin, 1987, 1990), written CF may be regarded as a form of input, and thus it is likely to be noticed, attended to, and processed, and thus may facilitate the development of explicit knowledge. Written CF is also likely to draw learners' attention to their explicit knowledge, and through the controlled processing of explicit knowledge or proceduralization of declarative knowledge (*procedural knowledge* and *declarative knowledge* are used when referring to skill acquisition theories and these two distinctions are used in this thesis despite the slight differences (Ellis, 2008)), L2 knowledge may be consolidated. Furthermore, learners' attention and their existing knowledge may influence cognitive processing, thus written CF type, error type and individual

learner factors (for example, proficiency level, language aptitude and attitude) may have an impact on the effect of written CF. Therefore, within the information processing framework, the main study of this thesis was conducted to investigate not only the effect of written CF on L2 development, but also to examine the moderating role of written CF type and linguistic error type, along with an important individual factor, a learner's proficiency level.

Unlike information processing theories, which focus exclusively on the processing mechanism, interactionists (e.g., Krashen, 1985; Long, 1981, 1996) put more emphasis on the interaction between the teacher and the learner during the time when written CF is negotiated and provided. They claim that interaction may not only engage the learner better in the cognitive processing, but also ensure the negotiated input meets the learner's need at the specific developmental stage. Therefore, it is likely that written CF provided via interaction may engage the learner better in cognitive processing, and also ensure written CF on each error meets the learner's current need for L2 development. It has been discussed in the information processing account that a number of factors may have an impact on processing. By providing written CF via interaction, the potential moderating factors referred to above may be taken into account in an integrated way. Therefore, a multiple-case study was also conducted in this thesis to explore any advantage of written CF provided via interaction.

1.2 Written CF research and theoretical explanations

This section will provide the theoretical explanations for the four main research areas in written CF studies. By referring to SLA theories and hypotheses, this section will explain why written CF has the potential to facilitate L2 development, and why its effect may differ due to written CF type, error type and a learner's proficiency level.

1.2.1 Does written CF enable learners to use targeted linguistic types more accurately in new writing tasks over time?

This is one of the main questions that has been investigated in written CF research. Gass' (1997) Computational Model is first drawn upon to explain the potential role of written CF in facilitating the development of explicit knowledge. Gass (1997)

explained that a single episode of information processing starts when the learner notices input. Written CF, as a form of input, has the potential to make the learner notice the difference between the information provided by the written CF and his/her existing knowledge. When the targeted feature in written CF is understood, it is processed in the short-term memory (STM) and matched up with his/her existing knowledge. As a result, a new hypothesis about what is acceptable L2 use may be formed and stored in the long-term memory (LTM). When the learner has the opportunity to produce output, the new hypothesis may be manifested in output. If the new hypothesis is still incorrect, further written CF may draw the learner's attention again, and another episode of processing written CF may start. In this way, written CF may be expected to facilitate the development of explicit knowledge.

Written CF may also be able to facilitate the conversion of explicit knowledge into implicit knowledge. Skill acquisition theories (Anderson, 1983, 2000; McLaughlin, 1987, 1990) have led us to believe that written CF may enable the learner to refer to his/her explicit knowledge, process it with conscious attention, and through practice, become automatic and proceduralized.

Cognitive information processing theories have led us to believe that written CF can improve L2 development. However, written CF research has tended to be more pedagogically motivated than theoretically motivated. A growing number of empirical studies have reported that written CF can improve accuracy in a pre-test, written CF treatment, post-test design. However, the effectiveness of written CF has mainly been reported when treating simple rule-based linguistic error types, for example, English articles (Bitchener, 2008; Bitchener & Knoch, 2008, 2009b, 2010a, 2010b; Ellis et al., 2008; Sheen, 2007a). Whether or not written CF is helpful for other linguistic error types, especially the less rule-governed, idiosyncratic ones, is still an open question. Therefore, a different rule-based linguistic error type (regular past tense), an idiosyncratic linguistic error type (irregular past tense), and a very complex and idiosyncratic linguistic error type (prepositions indicating space) were examined in this study to address my first research question: *Does written CF enable Chinese EFL learners to use targeted linguistic types more accurately in new writing tasks over a period of four months?*

1.2.2 Are some types of written CF more effective than others?

Cognitive processing theories have led us to believe that written CF has the potential to facilitate L2 development. However, its effect may vary due to different written CF types (of various degrees of explicitness). For a single episode of written CF processing, the explicitness of the written CF may draw a learner's attention to different levels, and thus written CF may be understood, processed and contribute to the development of explicit knowledge to different extents. For example, implicit written CF (e.g. underlining) may enable the learner to notice the gap in his/her existing knowledge, but it may not enable him/her to form a new hypothesis about acceptable L2 use. However, explicit written CF, for example, direct correction, may be more likely to help the learner form a correct hypothesis, and thus may better facilitate the development of explicit knowledge.

During knowledge consolidation, the explicitness of written CF may play a less important role than during the development of explicit knowledge. However, it may still make a difference in the amount and depth of controlled processing during knowledge consolidation. In more explicit written CF, some of the explicit knowledge is included, thus the learner may directly process it. On the other hand, with less explicit written CF, the learner has to find out what the problem is and search for the relevant explicit knowledge in his/her LTM, thus the processing may be deeper. For example, when *stand* is underlined, the learner may have to analyse why it is incorrect, recall what the relevant existing knowledge is (*stood* is the past tense form for *stand*), and then process the knowledge with conscious attention. However, with the same error, when direct correction (*stood* instead of *stand*) is provided, the learner may just process that explicit knowledge. Therefore, the differences in the depth of the controlled processing between more explicit written CF and less explicit written CF may contribute to knowledge being consolidated to different extents.

Written CF has been initially categorized into direct and indirect written CF. Direct written CF is providing the correct form for the error, but indirect written CF has been implemented in the form of underlining or error code in written CF studies (e.g. Chandler, 2003; Kepner, 1991; Semke, 1984; Sheppard, 1992). Besides, a

growing number of studies have looked at metalinguistic written CF as an individual written CF category and investigated its effect alone as well as when combined with direct correction (Bitchener, 2008; Bitchener & Knoch, 2008, 2009b, 2010a). A group of studies have compared metalinguistic written CF with its combination with direct correction (Bitchener, 2008; Bitchener & Knoch, 2008, 2009a, 2010a; Bitchener, Young, & Cameron, 2005; Sheen, 2007a); while the other group compared metalinguistic explanation with all other less explicit types of written CF (Bitchener & Knoch, 2010b; Shintani & Ellis, 2013; Shintani, Ellis, & Suzuki, 2014). Although an initial advantage for more explicit types of written CF (direct correction and metalinguistic written CF) has been reported (e.g. Bitchener, 2008; Bitchener & Knoch, 2008; Bitchener & Knoch, 2009a, 2010a; Bitchener et al., 2005; Sheen, 2007a), more studies are needed before any conclusions can be made because (1) these explicit and implicit types of written CF haven't been thoroughly investigated in one single study; (2) the superiority of more explicit types of written CF has mainly been examined in treating simple rule-based linguistic types, especially English articles.

In order to contribute to this under-researched area, all five types of widely used and researched written CF (underlining, error code, metalinguistic explanation, direct correction, direct correction plus metalinguistic explanation) were included in this study. The comparison of written CF types, differing in degrees of explicitness, might provide insights into the effect of written CF on L2 development, which justifies my second research question: *Is the effectiveness of written CF dependent upon its degree of explicitness (underlining, error code, metalinguistic explanation, direct correction, direct correction plus metalinguistic explanation)?*

1.2.3 Is written CF more effective for some linguistic types than others?

Besides *attention*, a learner's *existing L2 knowledge* is another key factor in information processing. For a single episode of written CF processing, whether or not the learner understands the written CF and forms a new hypothesis about the acceptable L2 use may depend largely on his/her existing knowledge. The learner's existing knowledge about different linguistic types may differ, and thus the effect of written CF on the development of explicit knowledge when treating different

linguistic error types may also differ. For example, written CF on rule-based errors is more likely to lead to the forming of a new hypothesis if there are rules in the learner's existing knowledge; while for less rule-governed, idiosyncratic errors, a new hypothesis may not be easily made as there are no rules to refer to. Therefore, written CF may be more likely to facilitate the development of explicit knowledge of rule-based linguistic types than less rule-governed, idiosyncratic types.

During knowledge consolidation, the proceduralization of the declarative knowledge of rule-based linguistic types is more likely to occur as a number of instances share the rules. For example, written CF on both *like* and *share* may lead the learner to process the same explicit knowledge twice, while written CF on *sit* and *stand* may activate each of these two different pieces of explicit knowledge once. However, for the less rule-governed, idiosyncratic linguistic types, written CF on each instance may only facilitate the processing of the explicit knowledge of the specific instance (e.g., *sat* and *stood*). Therefore, written CF may be expected to affect rule-based and less rule-governed, idiosyncratic linguistic error types differently.

A small number of written CF studies have started looking at the effect of written CF on other rule-based linguistic error types (e.g. past tense), and also less rule-governed, idiosyncratic ones (e.g. prepositions). However, the findings are still inconclusive (e.g. Bitchener et al., 2005; Shintani et al., 2014). To fill the gap, three very different linguistic error types were examined in this study: the simple rule-based regular past tense, the less rule-governed, idiosyncratic irregular past tense and the very complex and idiosyncratic prepositions indicating space (The reasons for this selection will be discussed in Section 4.3.4.) and the correlation between written CF type and linguistic type is addressed in my third research question: *Is written CF more effective in targeting certain linguistic errors (regular past tense, irregular past tense and prepositions indicating space)?*

1.2.4 Does the proficiency level of a learner have an impact on the effectiveness of written CF?

As a learner's existing knowledge may influence cognitive processing, the learner's proficiency level may be worth looking at when investigating the effect of written

CF. A learner's proficiency level may indicate whether or not he/she has the existing L2 knowledge (related to written CF) to some extent, and also how much cognitive processing capability he/she can afford. To date, no written CF research has investigated the moderating effect of proficiency level on written CF. It has been noted that in previous written CF studies, participants' L2 proficiency levels were very different (including pre-intermediate, intermediate and advanced). This may be an explanation for the mixed findings (Bitchener & Knoch, 2010a; Sheen, 2007a). Therefore, proficiency level was investigated as another potential moderating factor in my RQ4: *Does the proficiency level (higher and lower) of Chinese EFL learners determine how effective written CF is for improving the accuracy of (a) regular past tense, (b) irregular past tense and (c) prepositions indicating space in new writing tasks over a period of four months?*

1.2.5 Does no immediate improved accuracy mean that written CF is ineffective?

Unlike information processing theories which have been focused exclusively on the processing that occurs in a learner's brain, interactionists propose that written CF needs to be negotiated with each learner on each of the errors, so that successful information processing may occur, and thus written CF may facilitate optimal L2 development. Therefore, written CF of any kind may be unbeneficial because it is not provided through interaction, and thus may not meet the learner's need. Also, a certain type of written CF which benefits one learner on an error may not benefit another learner on a different error.

Most of the written CF studies have reported the effectiveness of written CF based on the improved accuracy of the majority of the participants. The findings did not imply that every participant's accuracy improved. Looking at the individual participant whose accuracy did not improve after receiving written CF may provide an insight into whether or not and why written CF does not work for some learners and on some errors. Therefore, one participant from each treatment group whose overall accuracy had not increased immediately after receiving written CF was analysed in-depth to address RQ5: *To what extent does no accuracy improvement*

in the immediate post-test mean that one session of written CF treatment has been not beneficial for Chinese EFL learners?

1.2.6 Does scaffolded written CF better facilitate improved accuracy?

A more social interactionist perspective of SLA proposes interaction as “a process that enables a learner to solve a problem, carry out a task, or achieve a goal which would be beyond his unassisted efforts” (Wood, Bruner, & Ross, 1976, p. 90). This process is called *scaffolding*, a term initially used by Jerome Bruner and his colleagues (Wood et al., 1976). Therefore, written CF provided through scaffolding (scaffolded written CF) has the potential to meet an individual’s need to produce the correct form on each error. This way, possible moderating factors that exist during cognitive processing, including the degree of explicitness of written CF, the number and complexity of the targeted linguistic error types, and all the learner’s individual factors (e.g. proficiency level), can be considered in an integrated way. Therefore, the optimal effectiveness of written CF on L2 development may be more fully understood.

To date, very few written CF studies have been conducted focusing on an individual’s responses to written CF (Aljaafreh & Lantolf, 1994; Erlam, Ellis, & Batstone, 2013; Nassaji & Swain, 2000). It has been reported that the written CF needed by each individual on each error varied, and scaffolded written CF was more helpful than random or explicit written CF. However, more studies are needed before any firm conclusions can be made. Therefore, this study went on to provide the selected participants with scaffolded written CF to explore any advantage of scaffolded written CF in my last research question: *To what extent does the provision of scaffolded written CF facilitate improved accuracy for Chinese EFL learners who failed to benefit from a single written CF treatment?*

1.3 The overall focus and design of this thesis

As both information processing theories and interactionism have proposed that written CF has the potential to facilitate L2 development, the study in this thesis was designed combining these two theoretical frameworks. A large-size quasi-experimental study was conducted first, followed by a multiple case study. First, one hundred and eighty one Chinese EFL university students (first year non-English

majors) participated in the quantitative study and were assigned to written CF groups (from the least to the most explicit types) and a control group. The effectiveness of one session of written CF on three linguistic error types (regular past tense, irregular past tense and prepositions indicating space) was examined immediately and over time (four weeks and four months). The effectiveness of written CF of various degrees of explicitness on the targeted linguistic error types as a group was first examined (RQ1); followed by the comparison of the effectiveness of these different written CF types (RQ2). Then the effectiveness of written CF was examined on the three targeted linguistic error types separately to test the correlation between written CF type and error type (RQ3). As the participants had different proficiency levels, the proficiency level (higher and lower) was also examined to determine whether or not it moderated the effectiveness of written CF in treating each error type (RQ4). After the main study, one participant in each treatment group whose overall accuracy had not increased immediately after the provision of written CF was invited to participate in the follow-up case study. For the case studies, each individual learner's errors were first analysed in-depth to trace the evidence that the one session of written CF treatment in the main study had been ineffective (RQ5). Each individual was also provided with scaffolded written CF with the aim of gaining insight into how and when written CF benefitted each individual learner's L2 development (RQ6).

1.4 Thesis outline

This thesis consists of seven chapters. Following the introduction, *Chapter 2* reviews two SLA accounts, cognitive information processing and interactionist, and specifies what role written CF may play and what factors may impact on the effectiveness of written CF in these two theoretical frameworks.

Chapter 3 reviews the existing written CF studies in a number of different categories. Limitations and gaps in previous research are highlighted and the research questions are identified for investigation.

Chapter 4 describes and justifies the methodological approach adopted in the study. With the aim of enriching the data from both perspectives, a multi-method design was adopted. The quantitative study provides the general trend regarding which

type of written CF is superior when provided to a group of people; while the follow-up case study portrays how each individual responds to different types of written CF.

Chapter 5 presents the results of the statistical analysis of the quantitative data and discusses how the first four research questions are addressed and how they contribute to theory, research and pedagogy.

Chapter 6 includes an in-depth analysis and interpretation of the findings of the case study, with reference to the last two research questions and in relation to SLA theories, previous relevant research findings and language teaching.

Chapter 7 synthesizes and summarizes the findings of both of the studies, emphasizes the theoretical, empirical and pedagogical contributions of the study, and indicates the research limitations and provides suggestions for future studies.

CHAPTER 2

THEORETICAL EXPLANATIONS OF THE EFFECTIVENESS OF WRITTEN CF FOR L2 DEVELOPMENT

2.1 Introduction

Written CF is arguably the most time consuming form of instruction for L2 teachers, and thus worth investigating at a pedagogical level, even without reference to theoretical explanations. However, it is important to consider SLA theories in discussions of the effect of written CF on L2 development because relevant theories have the potential to justify and guide written CF research. On the other hand, written CF studies may reveal how L2 develops and what affects the development process, which may in turn contribute to theory-building.

L2 learning has mainly been understood from a cognitive processing point of view since the early 1980s. It is believed that L2 explicit knowledge is first developed through processing noticed input, and then, through repeatedly processing with conscious attention, L2 knowledge is consolidated. In more recent years, attention has been raised regarding the factors which may affect information processing, including for example learners' noticing and their existing knowledge. However, interactionists claim that it is the interaction between the learner and the teacher that may be a key factor for the successful information processing.

The aim of this chapter is to explore the effect of written CF and the potential of impacting factors with reference to the notions and hypotheses within a cognitive framework. Although these cognitive accounts have largely been explained in terms of learning in an oral context, features of writing and written CF may lead us to believe that these accounts can also be applied in a written context. First of all, the pace of writing is slower, thus learners can afford more time on cognitive processing than during speaking. Secondly, as Williams (2012) pointed out, writing requires a focus on form that is often not present during speaking. Thirdly, feedback in a written context (written CF) leaves a permanent record, and may therefore have longer-lasting availability for cognitive processing. By comparison, oral CF may

easily be forgotten and is unavailable for later use. Besides, written CF is provided after the completion of writing, and may therefore lessen learners' cognitive burden and minimize their anxiety. For these reasons, writing and written CF may play an important role in facilitating cognitive processing. However, before arguing that written CF can facilitate L2 development, we need to have an overview of L2 learning.

2.2 An overview of L2 learning

L2 development is the preferable term used in this thesis with the aim of avoiding differences of opinion between *development*, *acquisition* and *learning*. Krashen (1982) argued that conscious learning about language and subconscious acquisition of language are different things and thus result in different types of competence. The acquired competence enables learners to use L2 knowledge automatically and unconsciously, which is the ultimate goal of L2 learning (DeKeyser, 2007); while learned competence only allows learners to use L2 knowledge in a controlled manner, consciously considering what constitutes target-like accuracy and appropriateness. Ellis (2008) further explained that the knowledge that acquired competence draws upon is *implicit knowledge*; and the knowledge drawing upon learned competence is *explicit knowledge*. *Declarative knowledge and procedural knowledge* are used when later referring to skill acquisition theories and the two distinctions are used interchangeably in this thesis. It can be seen that implicit knowledge is the goal of L2 learning. Thus whether or not explicit knowledge can be converted to implicit knowledge has become one of the foci of debate in the field of SLA.

Krashen (1985, 1994, 2003) takes a non-interface position and claims that learned knowledge cannot be converted to acquired knowledge. The weak interface position (N. Ellis, 2005) claims that explicit knowledge can be converted to implicit knowledge, but limitations on how and when it can occur need to be acknowledged. On the other hand, the strong interface position (DeKeyser, 1998) claims that through practice (see Section 2.3 for explanation of practice), explicit knowledge can be converted to implicit knowledge.

To investigate the relationship between the two types of knowledge is very important as it justifies the role of form-focused instruction (Ellis, 2008), and written CF is one type of this instruction. However, as DeKeyser (2003) pointed out, it might not be possible to distinguish the two types of knowledge in empirical studies as explicit knowledge may be proceduralized to a level that enables learners to use it rather than implicit knowledge. It may lead us to believe that explicit knowledge may be able to be used accurately and fast with very little conscious attention involved (still not implicit knowledge). Thus, as long as explicit knowledge can help learners to process it in a conscious manner through on-going practice, the role of instruction and written CF may be justified. Therefore, the realistic expectation of the effect of written CF is that it can contribute to the development of explicit knowledge and the controlled processing of it, so that L2 knowledge can be used accurately and fast over time, regardless of the type of knowledge.

In order to argue for such an effect of written CF, the first focus of this chapter is to explore what SLA theories and hypotheses say about the cognitive processing of L2 information. Therefore, the extent to which written CF can play a role in the process and what factors may moderate the progress can be explained. The other focus of this chapter is to explore interactionism and explain why written CF provided via interaction may better facilitate cognitive processing.

2.3 Cognitive processing account of SLA and the role of written CF

L2 development goes through three sequential processes: *knowledge internalization*, *knowledge modification* and *knowledge consolidation* (Housen & Pierrard, 2005). In the initial step, learners establish form-meaning connections as a result of processed (received) input (*knowledge internalization*). After the initial connections of form and meaning are made, learners continue to refine them in response to additional input (*knowledge modification*). The additional input can contain either positive or negative evidence. *Positive evidence* informs what is acceptable in L2 by providing well-formed sentences or structures; while *negative evidence* provides information regarding the incorrectness of an L2 form and is often realized in the form of corrective feedback (Gass, 1997). It is during these two

stages that explicit knowledge is developed. However, explicit knowledge needs to be processed with conscious attention repeatedly (*practice*) before it can be used accurately and fast. This stage of processing is called *knowledge consolidation*. The three stages of L2 development are presented in Figure 2.1.

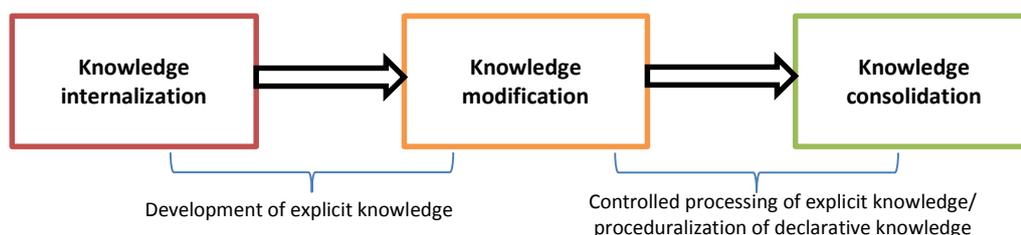


Figure 2.1. Three stages of L2 development.

It is easy to understand that before L2 knowledge is consolidated, errors are likely to occur. Errors may occur when learners attempt to build meaning-form connections about L2 on the basis of limited processed input or when they make faulty generalizations, apply rules incompletely and fail to learn the conditions under which the rules apply (Richards, 1971). For example, many learners have learned to add *-ed* to some verbs (e.g. laugh) to form the past simple tense, thus they may be likely to add *-ed* to all verbs. If written CF is provided at this stage, it may facilitate the development of explicit knowledge. Furthermore, after knowledge modification, errors may also occur when insufficient attention is involved in retrieving the meaning-form connections. For example, learners may know the past simple tense form of *sit* is *sat*, but due to the time limit or the complexity of the task (e.g. learners are not familiar with the writing task), *-ed* is mistakenly added to *sit*. If written CF is then provided, it may activate the controlled processing of explicit knowledge or the proceduralization of declarative knowledge, and thus contribute to the consolidation of knowledge (if not the conversion of explicit knowledge to implicit knowledge). Therefore, by referring to Gass' (1997) Computational Model and skill acquisition theories (Anderson, 1983, 2000; McLaughlin, 1987, 1990), this section will explain why written CF may facilitate the development of explicit knowledge (Section 2.3.1.1) and knowledge consolidation (Section 2.3.1.2); and then propose that the effect of written CF may differ due to its different types, and in treating different linguistic types. This section

will also point out other factors which may moderate the effectiveness of written CF.

2.3.1 Theoretical explanations of the effectiveness of written CF

This section of the thesis first provides the theoretical explanation of the effect of written CF on the development of explicit knowledge. It then goes on to explain how written CF can facilitate the consolidation of explicit knowledge.

2.3.1.1 The effectiveness of written CF for the development of explicit knowledge

As has been mentioned above, written CF may facilitate the development of explicit knowledge. It can be explained by drawing upon Gass' (1997) Computational Model. Gass' (1997) model explains five micro key stages in the cognitive processing of input to modified output: (1) noticed input (apperception), (2) comprehended input, (3) intake, (4) integration and (5) output. Her model was originally designed to explain the oral production. In fact, written production goes through a similar cognitive processing. In order to produce something, to receive input is the first step, no matter whether it is oral or written. Attention is a very important factor in the cognitive processing, especially at the stages of comprehending input and producing output; and in a written context, more attention may be afforded by learners (details for advantages of a written context see Section 1.1 and 2.1). Her model can be applied to written CF because it emphasizes the role of input, output and attention on L2 learning. Reading written CF on one's incorrect written production is a form of input; correcting the errors is a form of output. Besides, written CF is provided on one's own writing, thus attention is expected to be involved. Figure 2.2 below illustrates each of the five processing stages of a single written CF processing episode.

(1) Apperception/noticing of written CF

Gass (1997) explains that in order to benefit from written CF, the learner first needs to *apperceive* it. That is, the learner realizes/notices the linguistic error indicated by written CF is related to some aspect of his/her existing knowledge. That is to say, the *apperceived input* is the bit of linguistic information that is noticed by the

learner because it is related to the learner's existing L2 knowledge. Noticing the gap requires learner's attention to his/her existing knowledge. Schmidt (1990, 1994, 2001) distinguished between three levels of attention by drawing on Tomlin and Villa's (1994) work. The lowest level of attention is 'alertness', which refers to motivation and readiness to learn. The higher level of attention is 'orientation', which refers to the general focus on meaning or form; and the highest level of attention is 'detection', and refers to the cognitive registration of stimuli that allows for the further processing of information. Compared to positive input, CF is more likely to draw a learner's attention as it indicates something is wrong with his/her L2 knowledge. Given the explicit nature of written CF, a learner would have no difficulty detecting where the problem lies in his/her L2 knowledge with the indication of written CF. Therefore, written CF may be apperceived and be ready for the next stage of processing, *comprehension*.

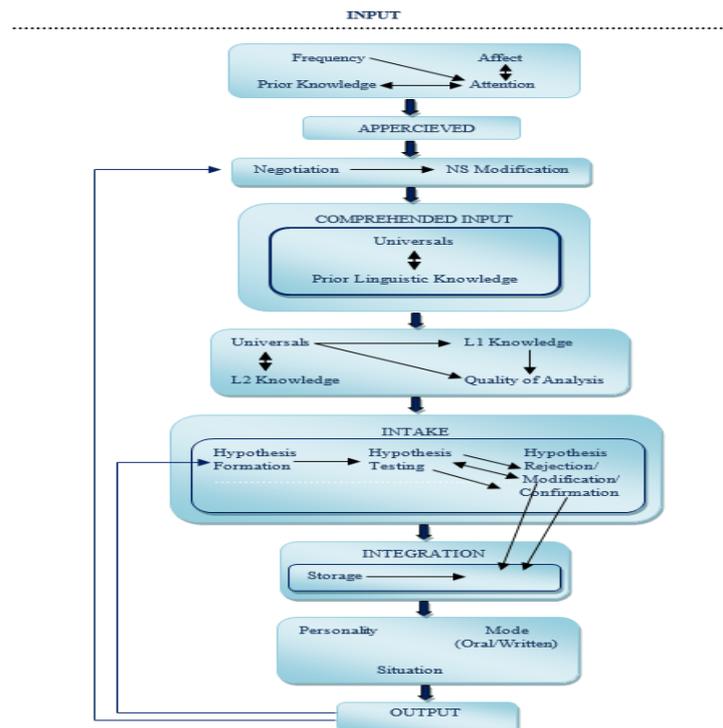


Figure 2.2. A model of second language acquisition. From *Input, interaction, and the second language learner*, by Gass, 1997, p. 3. Copyright 1997 by Lawrence Erlbaum Associates. Reprinted with permission.

(2) Comprehended written CF

Apperception/noticing relates to the potential for written CF to be comprehended, which is another level in the process of acquisition. However, it is not a yes-or-no concept, instead, '*comprehension* represents a continuum of possibilities ranging from semantics to detailed structural analyses'(Gass, 1997, p. 5). In other words, on the one hand, comprehension could happen at the level of meaning; that is, one understands the general message. On the other hand, deeper analyses could occur in comprehension; that is, the learner analyses the component parts and gains an understanding of the syntactic and phonological patterns represented (Gass, 1997). Just as a high level of attention (*detection*) could assist the learner to apperceive the input, only a high level of comprehension (syntactic and phonological analyses) may assist the input to be taken to the next stage of processing.

(3) Intake

After written CF has been comprehended, it successfully goes to *intake*. *Intake* refers to the mental activity that mediates the comprehended input and grammars in which the process of assimilating linguistic material happens. During intake, information offered by written CF is matched against the learner's existing knowledge, that is, in general the processing takes place against the backdrop of existing internalized grammatical rules (Gass, 1997). For example, *sat* is provided on the learner's incorrect past simple tense *sitted* for *sit*. The learner may understand that *i* has to be changed to *a* for *sit* when making the past simple tense. Then at the *Intake* stage, the learner may match the newly comprehended information to his/her existing knowledge and find it absent or different from his/her internalized existing knowledge.

Written CF is provided after the completion of written texts, thus more sufficient time and less communication pressure (than in an oral context) may ensure the learner has a thorough search and sufficiently uses his/her existing knowledge. Therefore, it is likely that written CF can be processed sufficiently at this stage.

(4) Integration

Intake, in general, results in two possible outcomes, both of which are a form of *integration* (Gass, 1997). One is the development per se of the learner's explicit

knowledge, and the other is storage. The explicit knowledge is developed in two senses. One is that the information in written CF is already incorporated into the learner's L2 knowledge, thus his/her existing L2 knowledge is reconfirmed (the case of knowledge consolidation, which will be discussed in Section 2.3.1.2). The other sense of development of explicit knowledge is that either the learner's hypothesis about some grammatical form is confirmed, thus his/her explicit knowledge is strengthened; or the learner's hypothesis is rejected due to the information in written CF, thus a new hypothesis is formed and awaits further confirmation from additional input. In both cases, written CF may contribute to the development of explicit knowledge. At the stage of knowledge modification, written CF may result in the rejection of a current hypothesis and the forming of a new hypothesis about a particular grammatical form. For example, when the learner receives direct correction *stopped* on his/her incorrect use of *stoped*, which may be formed based on the incorrect hypothesis that *-ed* should be added directly to *stop*, he/she may have to reject the previous hypothesis and may or may not form another hypothesis (for example, the last letter should be doubled before adding *-ed*, which is not really correct).

The other outcome of intake is storage, which means that the information in written CF is not immediately incorporated into the learner's L2 knowledge system because the learner needs to gather more evidence to form a hypothesis. Taking the same example mentioned before, *stopped* is provided, but the learner has no related existing knowledge to form a hypothesis about the rules to form a past tense form like this, thus the information is stored. When later, more information (such as metalinguistic explanation) is provided, a new hypothesis may be formed, for example, the last letter should be doubled before adding *-ed*. Again the hypothesis may or may not be correct. Gass (1997) also emphasized that integration is not necessarily a one-time affair and there are different levels of analysis and reanalysis that occur from the storage of the grammar. Thus, written CF may allow learners to analyse and reanalyse the information in the written CF when encountering the same linguistic types in subsequent writing practice. After integration, when the opportunity of output is provided, the learner may manifest the strengthened explicit knowledge or the newly-formed hypothesis.

(5) Output

Output is the last stage of a single processing episode. Gass (1997) points out that as an overt manifestation of the whole L2 acquisition process, output shows evidence of integrated knowledge, but the evidence may or may not be shown in the change of output because changes only occur in the underlying system. Therefore, it may be possible that sometimes there is no accuracy improvement immediately after written CF is provided. It may also be possible that one session of written CF treatment is not sufficient and additional sessions of written CF treatment may result in the manifestation of improvements in output. Besides, as mentioned above, integration is not necessarily a one-time affair and there are different levels of analysis and reanalysis, thus sometimes there may be no accuracy improvement in the immediate post-test, but there may be improvement in the delayed post-test(s).

It needs to be noted that output is not just a stage in which the integrated knowledge is manifested. Swain (1995) claimed that output itself is a valuable component of the acquisition process because output really forces learners to undertake complete grammatical processing and triggers their metalinguistic reflection so that learners may notice the gaps in their interlanguage system. Thus, output may drive forward the development of L2 syntax and morphology. Compared to output in the oral context, output in the written context may serve this purpose better as the slower pace of writing could permit learners to have more sufficient time and less communication pressure while processing and reflecting.

The contribution of a single written CF processing episode has been explained throughout each processing stage. What is important is that, as also pointed out by Swain (1995), the new hypotheses formed after the processing of written CF can be tested in output, thus if written CF is provided on the incorrect manifestation of hypotheses, another episode of written CF processing can be expected. Therefore, even if one episode of written CF processing cannot result in the building up of explicit knowledge, additional episodes are expected to eventually lead to knowledge modification.

However, after knowledge modification, errors may also occur as to draw upon explicit knowledge requires a lot of attention. In order to use L2 knowledge accurately and fast, L2 knowledge needs to be consolidated. Written CF is believed to play a role in it as it may activate the controlled processing of explicit knowledge, or the proceduralization of declarative knowledge.

2.3.1.2 The effectiveness of written CF on knowledge consolidation

Skill acquisition theories view language learning, like the learning of other skills, as starting from controlled processing or declarative knowledge, and through practice (controlled processing/proceduralization), automatic processing or procedural knowledge is achieved. The potential role of written CF in knowledge consolidation can be explained in McLaughlin's (1987, 1990) Model and Anderson's (1983, 2000) ACT (Adaptive Control of Thought) Model.

(1) McLaughlin's (1987, 1990) Model

In McLaughlin's (1987, 1990) Model, L2 development is posited as the shift from controlled processing to automatic processing, which means the L2 knowledge is eventually consolidated. He explained that controlled processing requires a lot of conscious attention and involves the temporary activation of selected information nodes in the short-term memory (STM). Short-term memory is also called working memory. Through repeated activation, the sequences produced by controlled processing become automatic. The short-term memory where the controlled processing takes place has limited processing capacity, thus when the shift occurs, it will be freed to attend to other information or integrate the newly-automatized information with other already-automatized information. The automatized information is stored in the long-term memory (LTM) in which the information can be made available very rapidly with minimal attention.

Therefore, after L2 learners have acquired explicit knowledge, they may still make errors in (oral or written) production when insufficient conscious attention is involved in the controlled processing. For example, the learner may know that *sat* is the past simple tense form for *sit*, but because the task requires the learner to focus on meaning and form at the same time, and very limited time is given, the

learner may not be able to retrieve the correct past simple form for *sit*. Instead, he/she may just add *-ed* as it is needed in a large number of past tense verbs. If written CF is provided now, the learner's conscious attention may be drawn to the specific linguistic form so the relevant explicit knowledge may be retrieved again with more conscious attention. That is, explicit knowledge is processed in a controlled way. This is how written CF can contribute to knowledge consolidation by reactivating the controlled processing of incorrectly retrieved information regarding the linguistic types.

(2) Anderson's (1983, 2000) ACT Model

McLaughlin's Model (1987, 1990) focuses on changes in the nature of processing, but does not distinguish the nature of knowledge. Anderson's (1983, 2000) ACT Model is based on a distinction of knowledge (similar to explicit and implicit knowledge distinction but less controversial), *declarative knowledge* and *procedural knowledge*, and his model explains how declarative knowledge could be proceduralized into procedural knowledge to contribute to L2 learning.

The model explains that learners first acquire declarative knowledge, which teaches 'what' knowledge, like grammatical rules. Then learners try to apply 'what' knowledge during performance to use 'what' knowledge. When learners are able to eventually perform 'what' knowledge rapidly and accurately, without consciously referring to the 'what' knowledge, procedural knowledge, or the 'how' knowledge, is acquired. One example of this is the ability to use grammatical rules correctly in oral or written form (Anderson, 1976). Anderson (2014) believes learning starts from declarative knowledge, and it goes through three stages to eventually become procedural knowledge.

1. The declarative stage: a description of the procedure is learned and stored. For example, the grammatical rule of adding *-ed* to a verb to form past simple tense is learned.
2. The associative stage: a method for performing the learned procedure is worked out, that is, the learner tries to proceduralize the declarative

knowledge. For example, the learner adds *-ed* to a verb in oral/written production, referring to the grammatical rules.

3. The autonomous stage: procedures become increasingly rapid and automatic. For example, the learner adds *-ed* more rapidly and automatically without consciously referring to the grammatical rules.

After building declarative knowledge (during *the declarative stage*), errors are likely to occur during *the associative stage* (Anderson, 1983). When written CF is provided, the learner may associate the declarative knowledge with corrected performance. In this way, the incorrect performance may be prevented from coming to the autonomous stage, and on the other hand, the correct performance may be automatized via the following practice.

So far, the facilitative role of written CF on knowledge modification and knowledge consolidation has been explained in a single episode of written CF processing and through an integral view of information processing. However, there are some factors which play an important role in cognitive processing, thus the effect of written CF on L2 development may be moderated by these factors. The next section will focus on the theoretical argument that the effect of written CF may differ due to different written CF types.

2.3.2 Theoretical explanations of the differential effectiveness of written CF types

Different types of written CF have been expected to facilitate L2 development differently because a learner's *noticing* and *existing knowledge* are two key factors in cognitive processing. Written CF of different types may draw a learner's attention to different levels, and the information included in different types of written CF may contribute to the development of explicit knowledge and the controlled processing of it to different extents.

In written CF literature, written CF has been categorized inconsistently. In this thesis, I developed a detailed categorization of written CF types by referring to Ellis' (2009) typology. Ellis (2009) identified three types of written CF: direct, indirect and metalinguistic written CF. *Direct written CF* has been typically defined as

providing correct forms, including crossing out unnecessary works, adding missing words, or writing down the correct forms near the errors. *Indirect written CF* has been defined as just indicating that errors have occurred with or without locating the exact errors. It is the learner's task to correct the errors. *Metalinguistic written CF* has been defined as providing either the nature of the errors by codes, or clear and accurate metalinguistic explanations for the errors. However, in some previous written CF studies, error code has been regarded as one form of indirect CF (Chandler, 2003; Ferris & Roberts, 2001; Lalande, 1982). In this thesis, five carefully categorized written CF types are investigated, including underlining, error code, metalinguistic explanation, direct correction and direct correction plus metalinguistic explanation. These written CF types vary in regard of degrees of explicitness. Underlining is the least explicit type of written CF, while direct correction plus metalinguistic explanation is the most explicit type of written CF. However, the focus of this thesis is not to argue about the categorization of written CF, but to investigate whether their effect on L2 development varies due to different degrees of explicitness.

As mentioned above, written CF, as a form of input, differs in salience (degrees of explicitness), and may therefore draw a learner's attention to different levels. Therefore, the outcome of one single written CF episode may be different. For example, at the stage of knowledge modification, more explicit types of written CF may be more likely to be apperceived, and then comprehended, so that may lead to improved accuracy; while less explicit types of written CF may not enable the learner to form a correct hypothesis, thus may not lead to immediate improved accuracy. The least explicit type of written CF may not even enable the learner to form a hypothesis, but may enable him/her to store the information and wait for additional input. At the stage of knowledge consolidation, less explicit types of written CF may be more beneficial because the learner has to search for the relevant explicit knowledge in the long-term memory. As a result, the controlled processing may be deeper. However, the information about the explicit knowledge is indicated or clearly explained in more explicit types of written CF (e.g., metalinguistic explanation, direct correction and direct correction plus metalinguistic explanation), and thus the controlled processing may not be that deep.

In written CF literature, there has been a theoretical argument about whether or not providing correct forms can benefit L2 development. For example, indirect written CF has been supported by Lalande (1982) because it invites the learner to ‘engage in guided learning and problem-solving’. There are also some who favour direct written CF and believe correct forms should be provided to learners. They suggest that providing correct forms can reduce learners’ confusion, offer more explicit feedback on the hypotheses and thus the immediate development of explicit knowledge may occur. Besides, there are some complex forms and structures which may not be easily understood, thus direct correction may better help them resolve complex errors. Recently, metalinguistic written CF has attracted researchers’ attention because it is believed that the rules and detailed explanations provided may cater to learners at any developmental level. It may provide the information needed for learners to form hypotheses, or draw learners’ attention to process the rules with conscious attention. These theoretical arguments may lead us to believe that different types of written CF may facilitate L2 development differently. However, there are some other factors which are closely related to existing knowledge that may also need to be taken into account. The next section will explain why the effect of written CF may differ when treating different linguistic error types.

2.3.3 Theoretical explanations of the differential effectiveness of written CF types for treating different linguistic error types

It has been argued by direct written CF supporters that direct correction may better help learners resolve more complex errors than other types of written CF. If this is true, the targeted linguistic types may need to be taken into account when investigating the effect of different types of written CF. That is, certain written CF types may be more helpful for certain linguistic error types.

It has been argued in CF literature that no single form of CF can be expected to help the acquisition of all linguistic error types (Truscott, 1996). Yang and Lyster (2010) put linguistic error types into two general categories by referring to R. Ellis’ (2005b) work. They defined *rule-based* errors as those which can be resolved by referring to a set of rules; while *item-based* errors, on the other hand, are less rule-governed,

idiosyncratic and grammatical rules are less likely to be helpful in resolving the errors.

It may be the case that written CF on rule-based errors is more likely to result in the forming of a correct hypothesis, and thus may benefit the correct use of other instances in the subsequent writing. Written CF on less rule-governed, idiosyncratic forms may be less likely to lead to the forming of a correct hypothesis; and even if it does, the correct hypothesis in one instance may not be correct for another. For example, direct correction *liked* (rule-based) is provided on *like*, then the learner may form the hypothesis that *-d* needs to be added to words ending with *e* to make the past tense form. Then in subsequent writing, when the learner needs to use the past form of *share*, he/she may be able to apply the hypothesis and use the correct form. While when *sat* (less rule-governed, idiosyncratic) is provided on *sit*, the learner may form a hypothesis that *i* needs to be changed into *a* when making the past tense form for *sit*, but this hypothesis may not benefit the correct use of other irregular past tense verbs, for example, *stand*. Despite the development of explicit knowledge, the effect of written CF on knowledge consolidation may also be better on rule-based forms than on less rule-based, idiosyncratic ones because the controlled processing of the explicit knowledge may be activated repeatedly when written CF is provided on errors which share the rules. On the other hand, the controlled processing of the explicit knowledge of each idiosyncratic form can be only activated once as there are not any shared rules. For example, written CF on both *like* and *share* may lead the learner to process the same explicit knowledge twice. While written CF on *sit* and *stand* may activate each of these two different pieces of explicit knowledge once.

However, it has to be noted that rule-based linguistic features can vary enormously in their complexity. For example, the rules for the use of regular past tense are relatively straightforward; while the rule for the hypothetical conditional is more difficult as it involves complex verb forms (Shintani et al., 2014). For example, in *If I were you, I would have bought the book*, four verbs in different forms are required. Therefore, it seems that rule-based errors may not always be easily *treatable* like Ferris (1999) defined. Instead, the complex rule-based errors, for

example, the hypothetical conditional, may be more *untreatable* than less rule-governed, idiosyncratic features, for instance, the irregular past tense.

Therefore, the effectiveness of written CF may vary when treating rule-based and less rule-governed idiosyncratic errors; and it may also vary when treating rule-based errors of different levels of complexity. However, as has been discussed in Section 2.3.2, more explicit types of written CF may help learners resolve more complex linguistic errors. Thus, some correlation between written CF types and error types may be expected. For example, more explicit written CF may be more helpful for complex rule-based and less rule-governed, idiosyncratic errors; while less explicit types of written CF may better benefit simple rule-based errors. However, it has to be noted that a learner's *existing knowledge* plays a very important role during cognitive processing, especially during *intake*. Therefore, the effect of different types of written CF in treating different linguistic error types may also depend on the learner's *existing knowledge*. When the learner has the related existing knowledge, less explicit types of written CF may be beneficial in treating complex rule-based or idiosyncratic errors; while when the learner does not have the related existing knowledge, only more explicit types of written CF may help even in treating simple rule-based errors.

2.3.4 Theoretical explanations of the moderating role of proficiency level

Existing knowledge plays a very important role during cognitive processing, because, on the one hand, comprehended written CF is matched against the learner's existing knowledge in his/her short-term memory; on the other hand, existing knowledge may affect the extent to which attentional capability could be afforded by the learner for cognitive processing. As *proficiency* refers to a learner's knowledge of and ability to use the targeted language (Loewen & Reinders, 2011), it may be an appropriate overall indicator of the learner's existing knowledge. Learners with higher proficiency levels are likely to have better or more existing L2 knowledge in general. Learners with higher proficiency levels are also more likely to have better existing knowledge on less rule-governed, idiosyncratic forms than those with lower proficiency levels, thus are possibly more likely to develop their explicit knowledge with the help of less explicit types of written CF. At the

stage of knowledge consolidation, the degree of explicitness of written CF, the complexity of the linguistic error types and the learner's L2 proficiency level may also need to be considered. This is because during controlled processing or the proceduralization of declarative knowledge, the learner's short-term memory and attentional capability could affect how much information can be processed (Robinson, 1995, 2003). Learners with different L2 proficiency levels may have different attentional capabilities and the learner with a higher L2 proficiency level may be able to free more working memory space and afford more conscious attention to the controlled processing or proceduralization of declarative knowledge as he/she has more automatized knowledge than the learner with a lower L2 proficiency level (McLaughlin, 1987, 1990). Therefore, when considering the effect of written CF in treating different linguistic error types, both the complexity of the linguistic error types and the learner's proficiency level may together determine the extent to which information in written CF can be processed and contribute to L2 development.

2.3.5 Summary of the theoretical explanations of the effectiveness of written CF in cognitive information processing

So far, the cognitive processing account of SLA has been reviewed, which has formed a firm foundation for the facilitative role of written CF on L2 development. The discussion of possible moderating factors during both the development of explicit knowledge and its consolidation has implied that the degree of explicitness of written CF (written CF types), complexity of the targeted linguistic types (error types), and the learner's proficiency level may impact the effect of written CF on L2 development. However, the cognitive information processing account of SLA focuses on the cognitive mechanism and the nature of input is quite static. Some researchers (e.g., Krashen, 1985; Long, 1981, 1996) claim that not just any kind of input can contribute to L2 development; instead, there are some requirements for the input to be noticed and comprehended so that it may benefit L2 development. The following section will review the interactionist account of SLA, which emphasizes the negotiation of the input before it goes to the processing mechanism. It is believed that the interaction between the teacher and the learner may ensure written CF is comprehended by the learner, which may make the steps of

information processing that follow possible. Besides, it has been argued that a learner's affective factors, such as learner anxiety and attitudes may also affect language learning processes and outcomes (Dörnyei, 2005; Gardner & MacIntyre, 1993a, 1993b). During the interaction/negotiation with the learner, the affective factors, along with cognitive factors (e.g. language aptitude) and contextual factors (e.g., EFL/ESL) may all be considered in an integrated way. Therefore, written CF provided via interaction may suit the learner's need best, and result in the desired language development.

2.4 Interactionist account of SLA and scaffolded written CF

Within information processing frameworks of SLA, written CF is believed to facilitate L2 development and its effectiveness may vary due to written CF type, error type and a learner's proficiency level. However, it has been noticed that there are always some learners who do not benefit from written CF. In order to find out and explain whether or not written CF is ineffective for some individual learners, a different theoretical framework may be needed. This section will review the interactionist account of SLA, which places emphasis on the negotiation that occurs before input goes into the processing cycle. This section will first review Long's (1981, 1996) Interaction Hypothesis, explaining how negotiation may ensure written CF is comprehended so that the optimal L2 development can occur. It will then go on to explain how scaffolded written CF may ensure the fullest effectiveness of written CF on L2 development.

2.4.1 Interaction Hypothesis

As has been discussed in the information processing account, input needs to be comprehended in order to contribute to L2 development. The great importance of the comprehensibility of input on L2 acquisition was initially pointed out and discussed by Krashen (1985) in his Input Hypothesis. He argued that exposure to a sufficient amount of comprehensible input at the $i+1$ level (i.e. slightly more advanced than a learner's current level) led automatically to acquisition. No doubt, Krashen's (1985) Input Hypothesis represents the initial step in exploring the relationship between input and L2 acquisition, which is still under investigation today. However, his ideas have often been criticized for lack of specificity; that is,

what exactly does 'I' refer to? And how can one make sure the input is just a little more advanced than a learner's current level with 'I'?

Having extended Krashen's (1985) Input Hypothesis, Long (1981) argued that conversational interaction between the learner and the teacher could ensure that the learner is receiving $i+1$ input rather than $i-3$ or $i+3$. He suggested that if conversational adjustments in interaction help make input more comprehensible, which is facilitative to L2 learning, then the linguistic and conversational adjustments that occur during interaction may promote language learning. His Interaction Hypothesis (1981) was later criticized for being focused on meaning (the functional aspects of language) rather than linguistic development. That is, interaction might facilitate communication, but how interaction could lead to grammatical development was not discussed, nor found in empirical studies.

As a response to the criticism, Long (1996) updated his Interaction Hypothesis and placed a greater emphasis on connecting input and the linguistic environment with the cognitive mechanism, explaining how interaction may facilitate L2 development. It is proposed that the interaction between the learner and the teacher might bring together the learner's selective attention and his/her developing L2 processing capacity most usefully, although not exclusively. Therefore, interaction may facilitate L2 development, at least for vocabulary, morphology and language-specific syntax, and is essential for learning certain specifiable L1-L2 contrasts (Long, 1996). His updated Interaction Hypothesis also states that a learner's processing capacity and degree of attention to linguistic form may determine the extent to which L2 input goes to the processing mechanism and contributes to L2 development.

In summary, Long's Interaction Hypothesis (1981, 1996) has proposed a role for oral CF as the teacher and the learner have to interact and negotiate to achieve mutual understanding, so that the teacher can find out where the error lies and the learner can understand the CF from the teacher. It should be noted that the interactionist theories have been developed in an oral context and negotiation is unavoidable to maintain oral communication and provide oral CF. In a written context, the learner's output does not depend on instant mutual understanding, thus

no negotiation of meaning is needed during the learner's production of written texts. However, it does not mean that the Interaction Hypothesis (Long, 1981, 1996) can not apply to how to provide written CF after, instead of during the production. Instead, written CF (CF on the written product) can also be provided in an oral manner, that is, written CF can be provided via negotiation between the learner and the teacher so that the written CF from the teacher is just what is needed by the learner, thus the optimal L2 development can be expected. The following section will review a very important interactionist construct, scaffolding.

2.4.2 Scaffolding and scaffolded written CF

The term *scaffolding*, which is most often seen in the literature of sociocultural theory, was actually first used by Jerome Bruner and his colleagues (Wood et al., 1976) in an educational context (Williams, 2012). In that case, scaffolding was used to refer to the ways in which parents and tutors assist young children in learning new skills and concepts. Scaffolding was defined as "...a process that enables a child or novice to solve a problem, carry out a task, or achieve a goal which would be beyond his unassisted efforts" (Wood et al., 1976, p. 90). Wood et al. (1976) further pointed out the functions of scaffolding include recruiting the learner's interest in the task, simplifying the task, keeping the learner on track, drawing the learner's attention to key aspects of the task or its solution, controlling frustration during problem solving, and demonstrating a possible solution to the problem posed by the task. Therefore, it can be said that scaffolding addresses both the cognitive demands of a learning goal and the affective states of the learners attempting to achieve the goal (Ellis et al., 2008).

The concept of scaffolding is also central to writing tutorials, since it constitutes a highly individualized, negotiated means of delivering CF on the learner's written texts, which is very different from teachers' conventional, transmission-style classroom instruction (McLaughlin, 1990). Aljaafreh and Lantolf (1994) claimed that through scaffolded dialogue, a teacher can provide uniquely tailored CF to an individual student working on a particular text. They added that effective scaffolded assistance should be *contingent* (the scaffolding is offered only when needed and removed as soon as the learner is able to perform independently), *graduated* (the

teacher estimates the lower and upper limits of the learner's ability and calibrates his/her assistance to the learner's changing needs), and *dialogical* (the assistance is embedded in a conversation in which both the teacher and the learner are actively engaged) (Aljaafreh & Lantolf, 1994, p. 468). Therefore, it is not hard to understand that scaffolding may lead to better L2 development than conventional instruction as it is highly tailored to the individual and provided only when needed by actively engaging the teacher and the learner in dialogical interaction.

The concepts of both dialogical interaction and scaffolding were developed in an oral context; however, they also apply to the written context. The influence of oral language on learners' writing development has been widely recognized in the planning, production, and revision of written texts (Anderson, 1983; McLaughlin, 1990). Oral feedback is often provided by teachers or tutors in one-on-one writing tutorials and conferences with L2 writers (Anderson, 2000, 2014; Lyster et al., 2013). Therefore, scaffolding can be expected to facilitate L2 development in a written context. Instead of providing written CF of a certain degree of explicitness to a group of learners, written CF might better facilitate L2 development if provided through dialogical interaction between the teacher and the individual learner, as each individual could be scaffolded with written CF of the particular degree of explicitness that meets his/her need. Therefore, the teacher may start from the least explicit type of written CF type and when the learner struggles, provide another more explicit type of written CF until the learner arrives at the correct form or understands the correct form provided by the teacher. However, one type of written CF may meet one learner's need, but may not meet another's. Furthermore, one type of written CF on one specific linguistic error may meet the learner's need, but this may not be the case when targeting another linguistic error. Therefore, it can be understood that the effect of written CF may be different for different individuals, different error types and even different linguistic instances. That is, in order to facilitate L2 development, written CF needs to be customized to each individual learner, to each error and be provided with a gradually increasing degree of explicitness when necessary (scaffolded written CF). This way, the scaffolded written CF may meet the learner's need on each specific error so that L2 development is facilitated to the fullest degree.

2.5 Summary

This chapter has provided a number of theoretical foundations for written CF. Although both the cognitive information processing and interactionist accounts of SLA believe written CF could facilitate L2 development, the foci of the two accounts are very different, thus the indication of how to provide written CF differs.

In the cognitive information processing view, written CF could facilitate either knowledge modification when used as a form of input or knowledge consolidation when used as a noticing-trigger. Furthermore, because the learner's attention, existing knowledge and processing capability play very important roles in cognitive processing, the degree of explicitness of written CF, the number and complexity of linguistic error types, and the learner's L2 proficiency level may moderate the effect of written CF on L2 development.

In the interactionist account of SLA, dialogical interaction is the key word. The Interaction Hypothesis (Long, 1981, 1996) empathises that negotiation of meaning may achieve mutual understanding between the teacher and the learner. Therefore, it is likely that the negotiated input is comprehended, goes through the following stages of cognitive processing, and eventually contributes to L2 development. The notion of scaffolding adds more features to the oral interaction, including recruitment, marking critical features and controlling frustration. In the interactionist account, each individual may need to be provided with scaffolded written CF on each incorrect linguistic instance. By doing so, L2 development may occur to the greatest extent.

Both SLA accounts provide very strong theoretical assumptions for the facilitative role of written CF on L2 development. A good number of empirical studies have been done and the effectiveness of written CF has been reported. The majority of the existing written CF studies were quasi-experimental studies and investigated the effectiveness of written CF on a group's response to written CF. Very few studies investigated the effect of written CF on an individual's performance after receiving written CF. The following chapter will synthesize and review these two groups of written CF studies and provide the justification for the present study

CHAPTER 3

A REVIEW OF WRITTEN CF STUDIES

3.1 Introduction

The theoretical notions and hypotheses reviewed in the previous chapter have led many in the field to believe that written CF can have a positive effect on L2 learning. The information processing account suggests that its effect may be moderated by a number of factors, including the degree of explicitness of written CF, the linguistic error type, and learner's proficiency level; while the interactionist account emphasizes the negotiation with each individual when providing written CF. However, until recently written CF research has been more pedagogically motivated than theoretically motivated. In order to relate the review of empirical studies to the theoretical expectations, existing written CF studies are divided into two parts.

The first part of this chapter (Part A) will review the studies which relate to the information processing framework; however, the cognitive focus has been more on output resulting from written CF than on information processing. That is, the effect of written CF on L2 development has been focused more on measuring a group of learners' improved accuracy after receiving written CF. These studies are mainly quasi-experimental studies and fall into four groups:

- (1) The first group of studies examined whether or not written CF can enable learners' improved accuracy. Some of the studies looked at improved accuracy in revisions, but more recent studies based their conclusions on improved accuracy in new written texts, especially over time.
- (2) The second group of studies explored the differential effectiveness of written CF of various degrees of explicitness.
- (3) The third group of studies looked at whether or not different error types are equally treatable with written CF by examining the effect of written CF on a number of error types.

- (4) The last group of studies, which are very few, began to explore the possible moderating factors on the effect of written CF, including contextual factors (international or migrant learners), individual difference factors (learner's aptitude), and affective factors (learner's attitude and anxiety). However, proficiency level has not been investigated in any of these studies.

Part B will review three case studies that investigated individual responses to written CF. These case studies relate to the interactionist framework as interactionists have proposed that dialogical conversation may ensure mutual understanding between the learner and the teacher. Thus, it may aid the comprehension of input and then lead to the desired learning. Therefore, scaffolded written CF provided to each individual is expected to result in proximal L2 development. In the three case studies, the effect of scaffolded written CF was examined alone, and its effect was compared to random written CF and to the most explicit type of written CF (direct correction plus metalinguistic explanation) respectively.

Part A Quasi-experimental studies

3.2 Studies on whether or not written CF can facilitate improved accuracy

Over the last 20 years, written CF researchers have dedicated themselves to investigating whether or not, and the extent to which, written CF may facilitate L2 development by looking at groups' accuracy improvement after written CF has been provided. Some of the studies have looked at accuracy improvement in revisions and some in new written texts. Having found convincing evidence regarding the effectiveness of written CF on improved accuracy in both revisions and subsequent written texts, recent studies have started investigating whether or not and the extent to which the improved accuracy may be retained over time. However, among these studies, some included a wide range of error types, from linguistic types to spelling and punctuation; while others have only focused on one or a few linguistic error types. This section will first review the revision studies, and then move on to new text studies, which include focused and unfocused studies, and the studies which compared the focused and unfocused approach.

3.2.1 Revision studies

Probably having been influenced by the *learning-to-write* perspective of L2 writing (see Williams, 2012), the initial written CF studies have focused on whether or not it can enable the learners to revise the written texts effectively. Therefore, the effectiveness of written CF was measured by the improved accuracy in revisions (e.g. Ashwell, 2000; Fathman & Whalley, 1990; Ferris & Roberts, 2001). These studies are summarized in Table 3.1.

Table 3.1

Revision studies on the effectiveness of written CF

<i>Studies</i>	<i>Participants</i>	<i>Treatment</i>	<i>Error types</i>	<i>Effectiveness</i>
Robb et al. (1986)	134 EFL freshmen in Japanese college	1. Direct 2. Error code 3. Underlining 4. Number of errors No control	Lexical, syntactic and stylistic errors	No
Fathman and Whalley (1990)	72 intermediate ESL students at colleges	1. Grammar feedback (underlining) 2. Content feedback 3. Grammar (underlining) & content feedback 4. Control	All grammar errors	Yes
Ashwell (2000)	50 EFL in Japanese university	1. Content then form (underlining/circling) 2. Form (underlining/circling) then content 3. Form (underlining/circling) and content 4. Control	Grammatical, lexical and mechanical errors of using cursors to indicate omissions	Yes
Ferris and Roberts (2001)	72 ESL university students	1. Error code 2. Underlining 3. Control	Verb errors, noun ending errors, article errors, wrong words and sentence structures	Yes

Fathman and Whalley (1990) and Ferris and Roberts (2001) found that *ESL* students who received written CF showed more accurate use of comprehensive linguistic types in their revised drafts than the students who did not receive written CF. Ashwell (2000) found similar results with *EFL* students in a Japanese university.

Robb et al. (1986) also conducted a revision study on *EFL* students in a Japanese college, but no between-group differences were found. Their different results from the other three studies may have resulted from design weaknesses. Most importantly, there was no control group to be compared with the written CF groups. The four experimental groups either received direct correction, error code, underlining or the number of errors was provided. Therefore, no between-group differences can only lead to the conclusion on the similar effect of these four written CF types; instead of the ineffectiveness of written CF. Besides, a very wide range of error types were targeted in this study. There were lexical, syntactic and even stylistic errors, which covers very different domains of English knowledge. Written CF may have enabled the learners to use one of the domains more accurately in the revisions, but the ineffectiveness of written CF on other domains may have offset it. Different results might have been found if the effect of written CF had been looked at across separated domains.

Although positive evidence for improved accuracy in revision after the provision of written CF has been reported in the majority of these revision studies (e.g. Ashwell, 2000; Fathman & Whalley, 1990; Ferris & Roberts, 2001), revision studies have been criticised that they cannot be the evidence for L2 development because successful revision does not necessarily indicate that the learners can write more accurately in new texts in the future (Truscott, 1996, 1999). Truscott reviewed revision studies and commented:

A writing task that students do with help from the teacher (the revision) is obviously not comparable to one they do on their own (the original essay), and so a study with this design does not yield any measure of learning, short-term or otherwise. (Truscott, 2007, p. 257).

It is rational and necessary to examine the effect of written CF in new texts because text revision is very different from writing a new text. In writing a new text, learners may experience deeper processing and focus both on meaning and form in a new linguistic environment; while in revisions, learners may only need to focus on form and revise errors in the same linguistic environment. Especially when the correct form is provided in written CF, learners may only need to copy the correct forms in

the revisions. Therefore, whether or not written CF could result in the development of explicit knowledge and knowledge consolidation, needs to be looked at in new texts, immediately after receiving written CF and over time.

3.2.2 New text studies

Among the new text studies, some of them covered a wide range of linguistic error types (including lexical, structural, punctuation and spelling errors as well), and are called *unfocused* written CF studies. All the revision studies reviewed above are unfocused studies. The other group of new text studies which only focused on a few linguistic error types (highly focused) or limited language domains (less focused) are called *focused* written CF studies (Ellis et al., 2008). The following section will first review the *unfocused* new text studies as all the early new text studies were unfocused. By highlighting the methodological shortcomings of a number of unfocused studies, the more carefully-designed *focused* studies will be reviewed and compared with the *unfocused* studies, which will finally lead to the justification of my first research question.

3.2.2.1 Unfocused new text studies

As with the revision studies reviewed above, the early new text studies were all *unfocused* studies (e.g. Chandler, 2003; Kepner, 1991; Semke, 1984; Sheppard, 1992). The effectiveness of written CF was examined by comparing the accurate use of all the linguistic error types in two independent written texts. These four studies are summarized in Table 3.2 with the methodological flaws highlighted.

Table 3.2

Early new text studies and methodological flaws

<i>Studies</i>	<i>Participants</i>	<i>Treatment</i>	<i>Methodological flaws</i>	<i>Effectiveness</i>
Semke (1984)	141 first year German FL students	1. Direct 2. Positive comments +direct 3. Error code 4. Control	Not a real control group (comments and questions)	No
Kepner (1991)	60 intermediate Spanish FL students	1. Direct 2. Control	No pre-test	No
Sheppard (1992)	26 upper-intermediate ESL students	1. Error code (location and type of errors) 2. Control	Not a real control group (comments and conferences)	No
Chandler (2003)	31 intermediate ESL students	1. Underlining+ revision 2. Control	Not a real control group (underlining)	Yes

In Semke's (1984) study, 141 first year German *FL* students in an American university were divided into three written CF groups and a control group. The treatment groups received direct written CF, error code and direct correction combined with positive comments respectively and the control group received written comments and questions rather than written CF. No significant differences in improved accuracy in new texts were found between the three written CF groups and the control group, and it was concluded that written CF was not beneficial for accuracy improvement. However, it should be noted that it was not a real control group as questions were asked and these may have raised the participants' attention and guided them to consider certain linguistic errors. Besides, there is an obvious flaw in data collection. The control group was marked by the number of understandable words written; while the other three written CF groups were graded on a ratio of the number of errors to the number of written words. That inconsistency in measuring accuracy makes the results problematic. Therefore, it is reasonable to caution against regarding the findings of this study as counterevidence to the effectiveness of written CF.

Kepner (1991) investigated the effectiveness of written CF by comparing the accuracy of two groups of intermediate Spanish *FL* learners, one of which received direct written CF and the other, which was a control group, only received content comments on their texts. The results did not show statistically significant differences in the number of errors between the two groups after a 12-week period; however, the design and methodological shortcomings need to be considered when interpreting the findings. As has been pointed out by Ferris (2003), Kepner did not compare the first set of written texts between the groups. That is, there was no pre-test that looked at whether or not the groups were initially at the similar accuracy level. Therefore, the lack of between-group differences in post-tests may not be interpreted to mean that written CF was ineffective. Thus, a sensible interpretation of the results of this study would be that evidence for the ineffectiveness of written CF was not clear.

Instead of an *FL* context, Sheppard (1992) conducted a study in an *ESL* context where 26 upper-intermediate *ESL* students were divided into two groups, with one group receiving coded error correction (error code), and the other group receiving comments relating to content. No advantage for written CF was reported in terms of improved accuracy; however, caution is needed when drawing a conclusion regarding the effectiveness of written CF. First of all, the control group was not a real control group, because in the one-on-one conferences, the teacher had discussions with the students when they had difficulty in understanding the content. Thus, as Bitchener and Ferris (2011) have pointed out, it is likely that some ambiguity of meaning may have arisen from the incorrect use of the targeted linguistic types. That is, it is almost impossible that the discussion of meaning can be isolated from the discussion of the targeted linguistic types. Secondly, both of the written CF group and the control group received a total of 35 hours of instruction on simple past tense and past perfect tense contrast, direct and indirect speech and subordination during the 10-week period of study. Thus, whether or not the control group has benefited from the instruction and improved the accuracy in new texts is worth questioning. Again, with these design flaws, we have to conclude that the study did not provide solid evidence for the ineffectiveness of written CF in an *ESL* context.

Only one out of the four early studies which examined the effectiveness of written CF on new text reported positive findings. By comparing the error reduction of the experimental group and the control group, Chandler (2003) confirmed the effectiveness of written CF in terms of error reduction in the writing of a new text. However, the study design was problematic. There was no real control group in the study. Both of the groups received written CF (underlining) before they carried out the subsequent writing task. The only difference is the experimental group had the chance to revise the draft while the control group did not. Therefore, the study actually compared the effect of revision instead of written CF on error reduction in the new text.

The above early *unfocused* new text studies which investigated the effectiveness of written CF on subsequent writing either did not show significant differences between written CF group(s) and the control group, or did not offer solid evidence in favour of written CF, which was, to a large extent, due to the methodological flaws. As has been mentioned in the section of revision studies, in order to support his criticism on revision studies and prove that the improved accuracy in revision could not be sustained in subsequent writing, Truscott and Hsu (2008) conducted a study which included a revision test and a subsequent writing test.

In their study, 47 high-intermediate *EFL* graduate students in a Taiwanese university were divided into the written CF group and the control group and were given 30 minutes to write a guided narrative story based on eight pictures. One week later, the written CF group received their written texts with all the grammatical errors underlined; while the control group did not have marked errors. Both of the groups were required to revise the written texts. One week later, all the students were given 30 minutes to write another guided narrative story based on a new series of eight pictures. Truscott and Hsu (2008) reported that the written CF group outperformed the control group in revision; however, the change in error rate from the first text to the subsequent text in both groups was not significantly different. This study has avoided the obvious design flaws and included a real control group and pre-test; however, it is too early to generalize that written CF can not contribute to L2 development. Only underlining, which is a type of written CF

of a very low degree of explicitness, was examined in the study, thus more explicit types of written CF might produce different results.

Van Beuningen et al. (2008) conducted a similar study, but on 62 Dutch *FL* students in secondary school. A wide range of error categories were included in the study, from word forms (e.g. verb tense, singular-plural), word choice, spelling, word order, addition or omission of a word to incomplete sentences, punctuation, and capitalization. Unlike Truscott and Hsu's (2008) study in which underlining (written CF with a low degree of explicitness) was examined, two more explicit types of written CF, error code and direct correction were compared to writing practice and self-correction without written CF. It was reported that the direct correction group showed improved accuracy in both revisions and new texts, while the error code group showed improved accuracy only in revisions. However, the groups which had extra writing practice and which had a chance to self-edit did not show significant improvement in accuracy in both revisions and new texts. The biggest difference between these two studies may be the degree of explicitness of written CF, which may explain the contradictory findings. It may indicate the effectiveness of written CF depends on how explicit it is, and that less explicit types of written CF, such as error code may not be able to facilitate L2 development (for the theoretical discussion underpinning the indication see Section 2.3.2).

Van Beuningen et al. (2012) expanded the sample size (268 participants) and further investigated the effect of written CF on two different language domains (grammatical and non-grammatical errors). As there is a wide range of linguistic types within the grammatical domain, it is still an *unfocused* written CF study. Adopting a similar study design in which direct correction and error code were compared with writing practice and self-correction, another delayed post-test over a 4-week period was added to examine the long-term effectiveness of written CF. The study reported that when looking at grammatical errors alone, only the direct correction group showed significantly improved accuracy in new texts (over four weeks); while when looking at non-grammatical errors alone, error code was found to be more effective than direct correction. This study not only confirmed the

effectiveness of direct correction in new texts, but further proved the retention of the effectiveness over time (four weeks).

The early *unfocused* new text studies (Chandler, 2003; Kepner, 1991; Semke, 1984; Sheppard, 1992) have made an initial attempt to prove the facilitative role of written CF on L2 development although no conclusion could be made due to the contradictory results and methodological flaws. The three recent *unfocused* studies (Truscott & Hsu, 2008; Van Beuningen et al., 2008, 2012) adopted a very sound methodology and reported both positive and negative results. However, the results were not contradictory, instead, the results should be interpreted that the facilitative role of written CF on L2 development may depend on the degree of explicitness of written CF and very implicit type of written CF (underlining in Truscott & Hsu, 2008) may not be able to contribute to L2 development; while more explicit type of written CF (direct correction in Van Beuningen et al., 2008, 2012) may.

Apart from the promising findings of these *unfocused* studies, the problems of the *unfocused* studies need to be noted. All sorts of error types being considered as one group might be a methodological flaw. Punctuation, spelling, sentence structure and linguistic types belong to very different domains, and the effectiveness of written CF in some of the domains might be offset by its ineffectiveness in others. Thus, when looking at a single domain, conclusions regarding the effectiveness of written CF might be different. Although Van Beuningen et al. (2012) examined the effectiveness of written CF on grammatical and ungrammatical errors separately, the grammatical errors include a wide range of error types and they may be different in nature and unequally treatable to a large extent (see Section 3.3 for details). However, their research may have shed light on the different effectiveness of written CF on different language domains (see Section 3.3 for further discussion). It may raise the question of whether or not there is a correlation between the degree of explicitness of written CF and the linguistic error type regarding the effectiveness of written CF (see Section 2.3.3 for theoretical verification of the question).

However, as has been mentioned above, the range of error types in this study is too wide and the two domains distinguished are too general. In order to find a correlation between the degree of explicitness of written CF and linguistic error

type, more detailed and sophisticated categorization is needed. Besides, as learners have limited attentional processing capacity (details see Chapter 2), written CF may have better effectiveness when it only focuses on one or a few error types. This way, it may be easier to find out the effectiveness of written CF and investigate the correlation between the degree of explicitness of written CF and the targeted linguistic type. In the last fifteen years, a good number of *focused* written CF studies have been conducted and will be reviewed in the following section.

3.2.2.2 Focused new text studies

Within the focused written CF studies, the majority are ‘highly focused’ (written CF on one error type only) and a small number are ‘less focused’ (written CF on a limited number of error types) (Ellis et al., 2008, p. 356). The ‘highly focused’ studies targeted the two functional uses of the English article system, that is, “the use of the indefinite article ‘a’ for first mention and the use of the definite article ‘the’ for anaphoric mentions” (Bitchener & Ferris, 2011). These studies investigated whether or not the effect of written CF could be retained over time in subsequent writing, especially over a long period of time (Bitchener, 2008; Bitchener & Knoch, 2008, 2009b, 2010a, 2010b; Ellis et al., 2008; Sheen, 2007a). Bitchener’s series of studies reported that the effectiveness of written CF on the two functional uses of the English article system was successfully retained for over ten months for lower intermediate ESL learners (Bitchener, 2008; Bitchener & Knoch, 2008, 2009b, 2010a) and ten weeks for advanced ESL learners (Bitchener & Knoch, 2010b) who were either migrants or international L2 learners. The effectiveness of written CF on the use of articles was also found retained for nine weeks for intermediate ESL learners (Sheen, 2007a) and ten weeks for EFL learners (Ellis et al., 2008) A summary of these studies can be seen in Table 3.3.

Table 3.3

Focused new text studies

<i>Studies</i>	<i>Participants</i>	<i>Treatment</i>	<i>Long-term effectiveness</i>
Bitchener (2008)	75 low-intermediate ESL	1. Direct+written&oral metalinguistic explanation 2. Direct+written metalinguistic explanation 3. Direct correction 4. Control	2 months
Bitchener & Knoch (2008)	144 low-intermediate ESL	1. Direct+written&oral metalinguistic explanation 2. Direct+written metalinguistic explanation 3. Direct correction 4. Control	2 months
Bitchener & Knoch (2009b)	52 low-intermediate ESL	1. Direct+written&oral metalinguistic explanation; 2. Direct+written metalinguistic explanation 3. Direct correction 4. Control	10 months
Bitchener & Knoch (2010a)	52 low-intermediate ESL	1. Direct+written&oral metalinguistic explanation 2. Direct+written metalinguistic explanation 3. Direct correction 4. Control	10 months
Bitchener & Knoch (2010b)	63 advanced ESL	1. Written metalinguistic explanation 2. Written&oral metalinguistic explanation 3. Circling 4. Control	10 weeks (not circling group)
Sheen (2007a)	91 intermediate ESL	1. Direct correction 2. Direct + written metalinguistic explanation 3. Control	4 weeks
Ellis et al. (2008)	49 intermediate EFL	1. Direct correction 2. Control	10 weeks
Bitchener et al. (2005)	53 post-intermediate ESL migrant students	1. Written metalinguistic explanation or direct+oral conference 2. Written metalinguistic explanation or direct 3. Control	12 weeks (only on past tense and articles)

However, instead of generalizing that written CF was effective both short-term and long-term, close analysis was needed to specify the indication of these findings. As can be seen in Table 3.3, the written CF treatment was quite explicit, including

either direct correction, metalinguistic explanation (in oral or written form), or both. Therefore, the more appropriate conclusion on these studies might be that more explicit types of written CF (compared to underlining and error code) enabled the learners to improve their accurate use of the two functional uses of the English article system over time. Written CF of a low degree of explicitness (circling) was only examined in one of the studies (Bitchener & Knoch, 2010b) and it was reported that unlike more explicit types of written CF (written metalinguistic explanation and written plus oral metalinguistic explanation), the effectiveness of circling was not able to be retained in ten weeks' time. Bitchener, Young, & Cameron (2005) also reported that written CF (written metalinguistic explanation and oral conference) was only found effective on past tense and the two uses of articles over time, but not on prepositions.

To sum up, the facilitative role of written CF on L2 development was confirmed in all these more carefully-designed focused new text studies. However, it is worth clarifying that only more explicit types of written CF enabled the learners to improve their use of the two functional uses of the English article system. Therefore, on the one hand, the effectiveness of less explicit types of written CF needs more exploration. On the other hand, English articles were the only targeted linguistic error types in most of these studies, and whether or not the findings could be applied on more linguistic error types needs to be answered. Although an initial attempt has been made on past simple tense and prepositions, studies on more linguistic error types are needed before any conclusions can be drawn. It is not hard to understand that further research on written CF of various degrees of explicitness is needed to determine how explicit written CF needs to be in order to facilitate L2 development. Therefore, my first research question is to investigate whether or not written CF enables the learners to use targeted linguistic types (other than English articles) more accurately in new writing tasks over time by examining written CF of various degrees of explicitness.

Despite both unfocused and focused studies reporting that more explicit types of written CF enabled the learners to improve accuracy in new written texts, there are two studies which compared the effectiveness of focused and unfocused written CF.

The findings further confirmed the advantage of written CF when focusing on a few linguistic error types.

3.2.2.3 Studies comparing unfocused and focused written CF

Ellis et al. (2008) investigated the effectiveness of written CF in an EFL context in a Japanese university, and the accurate use of two English articles was compared when written CF was only focused on them and when it was focused on a wide range of linguistic error types, including past tense, vocabulary, etc. Direct correction was provided on the incorrect use of two articles for the focused group; for the unfocused group, direct correction was provided on other linguistic error types besides the two uses of articles, and there was a control group. Although no significant difference between the focused and unfocused group was found in delayed post-tests, the accuracy in the focused group did continue to increase over time while the unfocused group did not.

Based on Sheen's (2007a) study of the effectiveness of written CF on English articles, Sheen et al. (2009) conducted a study to compare the effect of focused and unfocused written CF. Eighty ESL intermediate students were assigned to four groups: a focused written CF group which only received direct correction on the incorrect use of two articles; an unfocused CF group which received direct correction on a range of linguistic error types (i.e., articles, copula 'be', regular and irregular past tense and prepositions); a writing practice group which had two more written tasks to complete; and a control group. It was reported that focused written CF was significantly more effective than unfocused written CF over time (9 weeks).

To summarize the new text studies, both unfocused and focused studies reported the effectiveness of more explicit types of written CF (i.e. direct correction, oral/written metalinguistic explanation, and direct correction plus metalinguistic explanation), although comparative studies reported focused written CF was more effective than unfocused. However, it has to be noted that not all the written CF types were fairly examined and compared in these studies. Only the more explicit ones (i.e. metalinguistic explanation, direct correction and direct correction plus metalinguistic explanation) were often examined and only one of the studies examined a less explicit type of written CF, circling (Bitchener & Knoch, 2010b).

Besides, very limited linguistic error types were tested in the studies (mostly the functional uses of the English article system). Therefore, in order to confirm the effectiveness of written CF on L2 development, written CF of various degrees of explicitness needs to be examined in one single study. More linguistic error types should be tested, including both rule-based and less rule-governed, idiosyncratic ones. Therefore, my first research question (Does written CF enable Chinese EFL learners to use targeted linguistic types more accurately in new writing tasks over time) is well justified.

At the same time when the effectiveness of written CF was investigated, some of the researchers mentioned above also explored the differential effectiveness of written CF of various degrees of explicitness, seeking the most effective way of providing written CF. These studies will be reviewed in Section 3.3.

3.3 Studies on whether or not the effect of written CF varies according to different degrees of explicitness

The studies reviewed above have all confirmed the effectiveness of more explicit types of written CF (metalinguistic explanation, direct correction and direct correction plus metalinguistic explanation) in improving accuracy (over time). However, these three written CF types still differ in the degree of explicitness, the question whether or not there is any difference in the effectiveness of these explicit written CF options has been raised. The following section will review the studies which compared the differential effectiveness of metalinguistic explanation, direct correction and direct correction plus metalinguistic explanation.

3.3.1 Studies comparing direct correction and direct correction plus metalinguistic explanation

A good number of studies (Bitchener, 2008; Bitchener & Knoch, 2008, 2009a, 2010a; Bitchener et al., 2005; Sheen, 2007a) have examined the differential effectiveness of direct correction and direct correction combined with metalinguistic explanation in oral, written or both forms (see Table 3.4).

Table 3.4

Studies comparing direct correction and direct correction plus metalinguistic explanation

<i>Studies</i>	<i>Proficiency level</i>	<i>Error type</i>	<i>Treatment</i>	<i>Findings</i>
Bitchener & Knoch (2008)	Low-intermediate ESL	Two functional uses of the English article system	1. Direct+written&oral metalinguistic explanation 2. Direct+written metalinguistic explanation 3. Direct 4. Control	No difference
Bitchener & Knoch (2009a)	Low-intermediate ESL	Two functional uses of the English article system	1. Direct+written&oral metalinguistic explanation 2. Direct+written metalinguistic explanation 3. Direct 4. Control	No difference
Bitchener & Knoch (2010a)	Low-intermediate ESL	Two functional uses of the English article system	1. Direct+written&oral metalinguistic explanation 2. Direct+written metalinguistic explanation 3. Direct 4. Control	No difference
Sheen (2007a)	Intermediate ESL	Two functional uses of the English article system	1. Direct correction 2. Direct+written metalinguistic explanation 3. Control	Direct+written metalinguistic explanation was more effective than direct correction
Bitchener et al. (2005)	Post-intermediate ESL migrant students	Prepositions, past simple tense, definite article	1. Direct+oral metalinguistic explanation 2. Direct correction 3. Control	Direct+oral metalinguistic explanation was more effective than direct correction on past simple tense and definite article

Bitchener and Knoch (2008, 2009a, 2010a) examined the effect of three written CF types (direct correction, direct correction plus the written form of metalinguistic

explanation, and direct correction plus metalinguistic explanation in both oral and written forms) on the two functional uses of the English article system over a period of two months (2008), six months (2009a) and ten months (2010a). The participants in all of the studies were low-intermediate ESL students and the same results were found, that is, there were no significant differences between the three written CF options. The researchers have suggested that direct correction alone may therefore be sufficient to facilitate low-intermediate ESL students' use of articles with increased accuracy.

Bitchener et al. (2005) and Sheen (2007a) compared direct correction with and without metalinguistic explanation and found the differential effectiveness between them. Bitchener et al. (2005) investigated whether or not two types of written CF (direct correction and direct correction plus oral metalinguistic explanation) given to 53 post-intermediate migrant students resulted in different levels of improved accuracy in new written texts over a 12-week period. Three linguistic error types were targeted: past simple tense, prepositions and definite articles. The study found direct correction plus oral metalinguistic explanation to be significantly more effective than direct correction alone in increasing accuracy in the use of the past simple tense and definite articles in new written texts (over 12 weeks), but not in the use of prepositions.

Similar to Bitchener et al. (2005), Sheen's (2007a) study also found an advantage for direct correction combined with metalinguistic explanation (in written form only) on intermediate ESL learners' use of articles; however, the advantage was found in the delayed post-tests (3 and 4 weeks) but not in the immediate post-test. This may indicate that the effectiveness of direct correction and the most explicit type of written CF may not differ in the short-term, but the effectiveness of the most explicit type of written CF could be retained over time. It needs to be noted that the participants in this study were given two sessions of treatment, while most written CF studies have investigated the effectiveness of one session of written CF treatment, so the results may also be interpreted as indicating one session of written CF treatment is not sufficient to lead to significantly differential effectiveness.

The different results may also have been caused by the participants' different proficiency levels. The participants in Bitchener and Knoch's (2008, 2009a, 2010a) studies were low-intermediate ESL students; while there were intermediate and post-intermediate ESL students in Bitchener et al. (2005) and Sheen's (2007a) studies. It may indicate that low-intermediate learners were not able to make good use of the additional metalinguistic explanation due to little existing knowledge, while the intermediate learners were.

The studies which investigated the differential effectiveness of written CF actually raised more questions than they answered. First of all, the advantage of direct correction combined with metalinguistic explanation reported in the two studies may raise the question of how effective metalinguistic explanation alone would be. Secondly, the different results which may be caused by the participants' proficiency levels may indicate that the learner's proficiency level needs to be considered when investigating the effectiveness of written CF. Thirdly, the differential effectiveness of two types of written CF was found on past simple tense and articles, but not on prepositions, which may indicate that error type may also play a role on the effectiveness of written CF. Therefore, the following section will review the studies which compared the effectiveness of metalinguistic explanation alone with other written CF options, followed by the review of studies investigating the possible moderating factors on the effectiveness of written CF.

3.3.2 Studies comparing metalinguistic explanation and other written CF types

There are three studies to date that have investigated the effect of metalinguistic explanation alone and compared it with other written CF types (see Table 3.5).

Table 3.5

Studies comparing metalinguistic explanation and other written CF types

<i>Studies</i>	<i>Proficiency level</i>	<i>Design</i>	<i>Error type</i>	<i>Treatment</i>	<i>Findings</i>
Bitchener & Knoch (2010b)	63 advanced ESL	Pre-test, immediate post-test, delayed post-test (10 weeks)	Two functional uses of the English article system	1. Written metalinguistic explanation 2. Underlining/circling 3. Written&oral metalinguistic explanation 4. Control	Advantage for written metalinguistic explanation and written&oral metalinguistic explanation over time
Shintani and Ellis (2013)	49 low-intermediate ESL	Pre-test, immediate post-test, delayed post-test (2 weeks)	Indefinite article	1. Direct correction 2. Metalinguistic explanation 3. Control	Immediate effectiveness of metalinguistic explanation
Shintani et al. (2014)	214 pre-intermediate EFL learners at university level	Pre-test, immediate post-test, delayed post-test (2 weeks)	Indefinite article and hypothetical conditional	1. Direct correction 2. Direct correction plus revision 3. Metalinguistic explanation 4. Metalinguistic explanation plus revision 5. Control	Direct correction was more effective than metalinguistic explanation over time

Bitchener and Knoch (2010b) compared metalinguistic explanation in written form, metalinguistic explanation in both written and oral forms and underlining (circling). In the study, 63 advanced ESL learners at a university in the USA were given these three types of written CF on errors in the two functional uses of the English article system. The results showed the long-term (ten weeks) advantage for metalinguistic explanation in written form and for metalinguistic explanation in both forms, but there was no difference between these two options.

Shintani and Ellis (2013) compared the effect of written metalinguistic explanation and direct correction on the accurate use of indefinite articles. In their study, 49 low-intermediate ESL students were assigned three picture composition tasks and on the first pieces of writing, one group received direct correction on the incorrect

use of definite articles, another group received a metalinguistic explanation hand-out, and the third group as the control group, were asked to rewrite the story without looking at the first piece of writing. In the immediate post-test, the metalinguistic explanation group showed improved accuracy, but the direct correction group did not. However, the improved accuracy was not successfully retained in the delayed post-test after two weeks. The researchers concluded that metalinguistic explanation might have developed an awareness of the linguistic rules, so that the learners used the targeted linguistic types more accurately in a new piece of writing, however, the effect was not durable.

Shintani et al. (2014) compared these two written CF options again, but in an EFL context. What is different from the previous study is that one more targeted linguistic error type was added, the hypothetical conditional, and the writing task was a dictogloss. That is, the participants listened to an audio-recorded text twice and were asked to reconstruct the text. This study reported very contradictory findings to the previous one, showing that direct correction had longer lasting effectiveness than metalinguistic explanation. The study also investigated whether or not revision had an enhancing impact on the effect of written CF and reported direct correction plus revision to be the most effective compared to the other written CF options (metalinguistic explanation, direct correction and metalinguistic explanation plus revision). The researchers explained the differences in results might be due to the complex nature of hypothetical conditionals and that direct correction may be more beneficial than metalinguistic explanation on complex syntactical structures. However, there are other variables, including writing tasks, participants' contextual backgrounds (ESL and EFL) and L2 proficiency levels (low-intermediate and pre-intermediate) which might also have led to the different findings.

So far, the studies investigating the differential efficacy of various types of written CF have been reviewed and the superiority of direct correction and metalinguistic explanation has been tentatively acknowledged. However, to determine whether or not these two have differential effectiveness on L2 development, further studies are needed. Besides, a number of questions need to be addressed before drawing any

conclusions, such as whether or not the superiority of one depends on error type and students' L2 proficiency level (theoretical discussions see Section 2.3). The next section will review the written CF studies which have investigated whether or not the effect of written CF varies on different error types, which is one of the important variables in written CF research, given that initial differential effectiveness of written CF on different linguistic error types has been reported (Bitchener et al., 2005).

3.4 Studies on whether or not the effect of written CF varies according to linguistic types

As can be seen in the review above, English definite and indefinite articles have been the most examined error types in the existing written CF studies, and solid evidence has shown that written CF can facilitate the development of the two articles over time (in Bitchener's series of studies). However, mixed results have been found when written CF was targeted on other linguistic error types; for example, past simple tense, prepositions and other syntactical and structural errors (e.g. Bitchener et al., 2005; Shintani et al., 2014). Therefore, the effectiveness of written CF on other linguistic error types needs to be investigated, and it might also be worth looking at whether or not there is any relationship between the degree of explicitness of written CF and the complexity of linguistic error type (theoretical discussions see Section 2.3.3).

However, so far only one written CF study has investigated the differential effect of written CF on different linguistic error types. Bitchener et al. (2005) investigated the differential effectiveness of one session of direct correction plus metalinguistic explanation and direct correction alone on the post-intermediate ESL learners' use of three linguistic types: prepositions, past simple tense, and definite article. It was reported that for past simple tense, direct correction plus metalinguistic explanation was more effective than direct correction only in the immediate post-test, while no differential effectiveness between the two written CF types was found regarding the use of definite article. For prepositions, neither of the two written CF types was found effective, immediately and long-term. The results may be interpreted that for simple rule-based error types (definite article), one session of direct correction

alone was sufficient to facilitate learners' L2 development over time; while for more complex linguistic error types (past simple tense), one session of the most explicit written CF may contribute to L2 development better, although the superiority to direct correction alone was not retained over time. For the very complex and idiosyncratic linguistic error type, prepositions, one session of the most explicit written CF treatment was not sufficient to facilitate L2 development, even in the short-term. The results may lead to the conclusion that the more complex the linguistic error type is, the more explicit the written CF needs to be, and some very complex and idiosyncratic linguistic error types are not 'treatable' (Ferris & Roberts, 2001) at all. However, a few things need to be noted before any conclusion could be made.

The definite article, past simple tense and prepositions seem to represent linguistic types of increasing levels of complexity; however, within past simple tense, there are regular and irregular past tense forms, of which the former are more simple *rule-based* (as the definite article) and the latter are more *idiosyncratic*. Besides, within prepositions, there are prepositions indicating time, space and movement and the complexity levels vary among them (the category of prepositions indicating time is more rule-based than prepositions indicating space). It is reasonable to expect different results if the targeted linguistic types were fairly categorized. It might not be easy to sophisticatedly categorize the linguistic error types, but the rule-based and idiosyncratic division might be very helpful in order to find out the correlation between the degree of explicitness of written CF and the complexity of linguistic error types. For rule-based linguistic error types, there is a general rule to refer to when producing the forms, thus less explicit types of written CF (e.g. underlining) might be able to remind learners of the rules. Thus, correction could be made by learners and further errors might be avoided. On the other hand, more explicit types of written CF (e.g. metalinguistic explanation) might have great effectiveness in both the short-term and long-term as the rule is provided. And then it might enable learners to refer to in the subsequent writing over time. However, for idiosyncratic linguistic error types, each individual use might be different and no general rule could apply, thus written CF of a very high degree of explicitness (e.g. direct correction) might be needed to provide the correct forms for learners. Besides,

written CF might not be able to benefit the subsequent writing as different instances might be used and no general rules could be applied on the new instances. It might seem impossible to facilitate the development of very complex and idiosyncratic linguistic types through written CF. However, written CF is used and expected to facilitate the development of partially-acquired linguistic types instead of new ones. That is to say, as discussed in Chapter 2, written CF is expected to facilitate either the development of explicit knowledge or its consolidation. Therefore, it is rational to expect the differential effectiveness of written CF of different degrees of explicitness on linguistic error types of well distinguished different natures (regular past tense, irregular past tense and prepositions indicating space).

The other point that needs to be noted is that the participants in Bitchener et al.'s (2005) study were post-intermediate ESL learners who may have had better existing L2 knowledge of the targeted linguistic types. It may explain why direct correction alone was sufficient to facilitate the accurate use of the definite article over time. As has been discussed in Chapter 2, a learner's existing knowledge has a great impact on a single loop of input-processing, the proceduralization of declarative knowledge or the automatization of controlled processing. Therefore, it might be more realistic and helpful to take both linguistic error type and learner's proficiency level into account when considering the effectiveness of written CF in future studies.

It has been discussed in Chapter 2 that learners' attention and existing knowledge are very important factors which determine whether or not and the extent to which information processing can occur. Thus when considering the effect of written CF on L2 development, it may be worth looking at the factors brought into cognitive processing by learners, both cognitive and affective, such as learners' L2 proficiency level, instructional context, and language aptitude and attitudes. The following section will review the studies which investigated possible moderating factors on the effect of written CF.

3.5 Studies on whether or not the effect of written CF is moderated by other factors

Besides written CF type and error type, in written CF studies there have been a lot of variables, which might have also led to the different results on the effect of

written CF. For example, some of the participants were ESL learners, while others were (E)FL learners; some of them had intermediate proficiency level, while others were at an advanced level. Thus, researchers started investigating the possible moderating factors on the effect of written CF although the studies are very limited till now.

3.5.1 Instructional context and the effect of written CF

Instructional context here refers to a second language (SL) or a foreign language (FL) environment because it has been pointed out that FL writers may have less motivation to attend to written CF than SL learners because their purpose for learning a foreign language is to either pass required tests or acquire some qualification (Hedgcock & Lefkowitz, 1994). However, it might be the other way around in that FL writers may attend more to written CF than SL writers because there is a high requirement for accuracy, at least in some pedagogical contexts (e.g. in mainland China).

It may also be the case that EFL students are likely to study English in a relatively formal instructional context in which explicit knowledge and grammatical rules are taught; while ESL students are more likely to acquire English in an informal context by picking up language in conversation. The difference may result for EFL students referring to explicit knowledge in writing, while ESL students may refer to informally-acquired knowledge. When it comes to the effect of written CF, a more explicit type of written CF may better facilitate improved accuracy for EFL students, while more implicit knowledge could be preferred by ESL students. Bitchener and Knoch (2008) have attempted to examine whether or not this factor might impact learners' responses to written CF by comparing international students (more like EFL learners) and migrants (more like ESL learners). Seventy-five international students and 69 immigrant students received written CF on the two functional uses of English article system. They were assigned to three written CF groups (direct correction, direct correction plus written metalinguistic explanation, direct correction plus oral and written metalinguistic explanation) and a control group. The results showed no difference between international students and immigrant students in terms of the accurate use of definite and indefinite articles. The results

may be because there may not be a big difference between these two groups in terms of their instructional context. The migrants may have come from an EFL context and recently become migrants. They may also have been international students not long ago, or the migrants may not have had more exposure to English than the international students. Thus, further studies need to compare learners who really come from different instructional contexts, for example, the university students in mainland China and in Hong Kong. Besides, most of the recent written CF studies, especially Bitchener's series of studies, have focused on ESL students. Written CF studies need to look at EFL students and more noticeable effectiveness of written CF, especially written CF of a higher degree of explicitness, may emerge.

3.5.2 Individual factors and their effect on written CF

Up to recently, only a few studies have investigated the moderating role of individual differences on the effect of CF in both oral and written contexts. Sheen (2007a) investigated the relationship between written CF and learners' language aptitude. A significantly positive association was found between students' gains and their language aptitude. Sheen claimed that the results could be explained by Schmidt's (1995) levels of attention. That is, metalinguistic explanation triggered a higher level of attention from the students with high language aptitude, who had a greater capability to engage in language analysis, so that the information in the metalinguistic explanation was processed to a large extent and finally manifested in output; while the same metalinguistic explanation might have exited the information processing cycle early for learners with low language aptitude as these learners were not able to attend to or comprehend the metalinguistic explanation.

Sheen (2011) examined three individual learner variables: language aptitude, anxiety and attitudes toward written CF. Her study investigated the moderating role of these factors on oral and written CF respectively. For written CF, the study design was very similar to her previous study (Sheen, 2007a). A strong correlation between metalinguistic explanation and language aptitude was confirmed in this study. However, the moderating effect of language anxiety was not found regarding written CF, but only in the case of metalinguistic explanation in the oral context. The finding regarding the effect of anxiety on written CF is actually counterproof

of Truscott's (1996, 1999) hypothesis that written CF could cause anxiety, making written CF useless and harmful. On the contrary, a stronger correlation between learner attitude and the effect of CF was found in the written context than in the oral context. The results also showed metalinguistic explanation is beneficial to a much greater extent for learners who have positive attitudes towards written CF than for those who do not.

Other than language aptitude, L2 proficiency level may be another very important cognitive factor as it is associated with existing L2 knowledge and related to how much attention and working memory capacity the learner could afford in cognitive processing (details see Section 2.3.4). However, there have been no studies so far that have compared the effect of written CF on students with different L2 proficiency levels. In most studies of CF, the subjects came from natural groups, meaning although they were enrolled in the same class or paper, it cannot be assumed that they were at the same level of proficiency. As Frodesen and Holten (2003) have claimed, students in the same ESL class can vary widely in terms of grammar, structure, vocabulary and instructional backgrounds.

Unfortunately, no study has measured and reported the L2 proficiency levels of the participants; instead, the level of programme they are enrolled in has been taken as their proficiency level. Besides, the assessment or the criteria used to determine the proficiency level might be very different throughout countries and educational systems. That is, an intermediate level in New Zealand might be an upper-intermediate or lower-intermediate level in China. Therefore, written CF research has been conducted on various proficiency levels, but it is almost impossible to replicate the studies, make comparisons, or lend reliability and validity to the results. Although most of the studies took a pre-test, normally it was a writing task or a cloze test, or both (e.g. Robb et al., 1986; Semke, 1984) to justify the participants were of a similar proficiency level. A pre-test, which often focusses on the targeted linguistic type(s), might be not enough to demonstrate the learner's holistic proficiency. In addition, some descriptive research has shown that the overall proficiency level of the students must be considered when written CF is provided (e.g. Hyland, 2003; Qi & Lapkin, 2001).

It might not be realistic to keep the exact same criteria of proficiency level all over the world, no matter for (E)SL or (E)FL students. However, it might be very constructive if written CF research could generally examine whether or not students of higher proficiency level could benefit more from less explicit types of written CF, while the lower proficiency students could make better accuracy improvement after receiving more explicit types of written CF.

Sheen's (2007a, 2011) studies have revealed very valuable findings and future written CF researchers may need further exploration of how individual factors moderate the role of written CF. Cognitive factors, such as aptitude and proficiency level may be worth investigating as they directly affect cognitive processing. Affective factors like attitudes towards written CF need more investigation as well as the affective factors may influence how much attention the learners could pay to cognitive processing, which could indirectly impact the effect of written CF.

So far, the more carefully-designed quantitative written CF studies have contributed greatly to our understanding of how written CF, as a form of input and noticing-trigger, facilitates L2 development and what factors may have an impact on the effectiveness of written CF. However, some researchers have noticed there are always some individuals whose accuracy does not improve after receiving written CF. The immediate effectiveness of written CF based on a group of participants has been proven in all of the recent written CF studies, but why do some individuals apparently not benefit from it? In addition, the interactionists have proposed that interaction between the learner and the teacher may ensure the comprehension of input and thus, scaffolded written CF may lead to the optimal L2 development. Therefore, Part B of this chapter will review these scaffolded written CF studies.

Part B Scaffolded written CF studies

Despite the confirmation of the effectiveness of written CF and the initial attempt to explore the impacting factors on the effectiveness of written CF within the framework of cognitive information processing theories, interactionists, especially the more social interactionists (e.g. Aljaafreh & Lantolf, 1994; Nassaji & Swain, 2000) have started to argue that the traditional quasi-experimental studies which measured the effectiveness of written CF on the written texts of a group of learners

did not show the full picture. They argued that in order to facilitate L2 development, the input provided by the teacher has to be negotiated with each individual, so that the input could be comprehended and contribute to L2 development. Therefore, how explicit written CF needs to be to facilitate the development of certain linguistic types, which is one of the questions in the quasi-experimental studies, may not be a valid question within the interactionist framework. For such interactionists, written CF has to be negotiated between the teacher and the individual learner, so that the written CF needed by the individual for a specific error can be assessed and the provision of the scaffolded written CF could result in the desired learning effect. The following section will review the very limited scaffolded written CF studies, in which scaffolded written CF was provided and the effectiveness of written CF was measured differently.

3.6 The effect of scaffolded written CF: Aljaafreh & Lantolf's (1994) study

Aljaafreh and Lantolf (1994) initiated an investigation into individual responses to written CF. Three ESL students of different L1 backgrounds participated in their study. The three students were required to write one essay in class per week for eight weeks and thirty to forty minutes of one-on-one tutorials were provided targeting four linguistic features: articles, tense marking, prepositions and models. A 'Regulatory Scale' was developed by the authors that ranked CF options from the least explicit to the most explicit (see Figure 3.1). The least explicit type of written CF was first provided to the students. If they failed to achieve the correct forms, another more explicit type of written CF was provided according to the scale.

The findings of the study showed that all three students improved in linguistic accuracy due to the scaffolded CF; however, the degree of explicitness of written CF each student needed varied. Their study showed that learners' writing accuracy improved due to the negotiation of written CF strategies. The authors claimed that the effectiveness of written CF on language development depends essentially on the mediation provided by teachers in which feedback becomes relevant and can be appropriated by learners to modify their interlanguage knowledge. That is to say, all types of feedback (written CF of any degree of explicitness) are potentially facilitative for development, but the effectiveness depends on the individual

learner's need. This individual-based study did report that scaffolded written CF resulted in the improved accuracy for all of the three cases. However, the findings may not be interpreted that the scaffolded written CF was more effective than written CF of a given degree of explicitness because no comparison was made in the study. The following sections will review two studies in which scaffolded written CF was compared with prescribed written CF of various degrees of explicitness.

0. Tutor asks the learner to read, find the errors, and correct them independently, prior to the tutorial.
1. Construction of a "collaborative frame" prompted by the presence of the tutor as a potential dialogic partner.
2. Prompted or focused reading of the sentence that contains the error by the learner of the tutor.
3. Tutor indicates that something may be wrong in a segment (e.g., sentence, clause, line) – "Is there anything wrong in this sentence?"
4. Tutor rejects unsuccessful attempts at recognizing the error.
5. Tutor narrows down the location of the error (e.g., tutor repeats or points to the specific segment which contains the error).
6. Tutor indicates the nature of the error, but does not identify the error (e.g., "There is something wrong with the tense making here").
7. Tutor identifies the error ("You can't use an auxiliary here").
8. Tutor rejects learner's unsuccessful attempts at correcting the error.
9. Tutor provides clues to help the learner arrive at the correct form (e.g., "It is not really past but something that is still going on").
10. Tutor provides the correct form.
11. Tutor provides some explanation for use of the correct form.
12. Tutor provides examples of the correct pattern when other forms of the help fail to produce an appropriate responsive action.

*Figure 3.1. Regulatory Scale. From "Negative feedback as regulation and second language learning in the zone of proximal development," by Aljaafreh and Lantolf, 1994, *The Modern Language Journal*, 78(4), p. 471. Copyright 1994 by John Wiley & Sons. Reprinted with permission.*

3.7 A comparison of scaffolded written CF and random written CF: Nassaji & Swain's (2000) study

Nassaji and Swain's (2000) study investigated the effect of written CF on two intermediate level ESL students. One of them received scaffolded written CF (as in

Aljaafreh and Lantolf's (1994) study), while the other was given random written CF of any type. The students were required to write one composition per week and four sessions of 40 minute tutorials targeting articles were provided. The tutorial sessions were recorded, transcribed and analysed as qualitative data; also in the final session, students were assigned student-specific, task-related cloze tests to assess their knowledge of articles. Therefore, this study not only tried to look at whether or not learners could use articles in writing tasks more accurately after receiving written CF, but also investigated whether or not their grammatical knowledge about articles had improved.

The findings suggested that the student receiving scaffolded CF had higher accuracy in subsequent written texts and had better grammatical knowledge about articles. However, two things have to be pointed out when considering the findings. On the one hand, only two students were compared regarding the effectiveness of two ways of providing written CF, thus the findings need to be interpreted with caution. On the other hand, written CF of various degrees of explicitness was randomly provided to the student, which might result in the less improved accuracy compared to scaffolded written CF. It has been confirmed in a good number of quasi-experimental written CF studies that more explicit types of written CF (metalinguistic explanation, direct correction and direct correction plus metalinguistic explanation) enabled the learners to use articles more accurately over time (Bitchener, 2008; Bitchener & Knoch, 2008, 2009b, 2010a, 2010b; Ellis et al., 2008; Sheen, 2007a). Therefore, the question might be raised that whether or not the scaffolded written CF is more effective than more explicit types of written CF, which was examined in Erlam, Ellis, & Batstone's (2013) study.

3.8 A comparison of scaffolded written CF and highly explicit written CF: Erlam et al.'s (2013) study

Erlam and her colleagues (2013) conducted a study to compare two ways of providing written CF, scaffolded written CF and conventional written CF with certain degree of explicitness in oral conferences following two pieces of writing. Both past tense verbs and the two uses of articles were targeted. In one group of students, seven ESL learners were provided with the 'appropriate level of assistance'

to encourage ‘the learner to function at his or her potential level of ability’ (Aljaafreh & Lantolf, 1994, p. 468) (scaffolded CF). Eight ESL learners, who were in the other group, received direct correction, and ‘in most cases (90%) it was accompanied by some form of metalinguistic explanation’ (Erlam et al., 2013). The results showed that the scaffolded CF was more effective in enabling learners to self-correct the targeted errors; however, the advantage of scaffolded CF in revisions was not retained in new written texts. For the scaffolded CF group, the amount of assistance required was highly variable both within the same feedback session and between sessions. That is, there was no evidence to show less written CF assistance was needed after one session of scaffolded written CF.

It was concluded that as the scaffolded written CF did not reveal an advantage in L2 development, the most explicit types of written CF (direct correction plus metalinguistic explanation) was actually more effective as it can be executed easily and quickly. Although this study did not support Aljaafreh and Lantolf’s (1994) findings, it is still too early to reach any conclusions regarding these two approaches. Besides, the results of this study need to be interpreted with caution as the group which received the most explicit type of written CF had a higher proficiency level and the scaffolded CF group received more feedback episodes and longer writing conferences. All these factors may have had an impact on the results.

Although very limited in number, these three scaffolded written CF studies have provided a new dimension to understanding the effectiveness of written CF, but more carefully-designed studies are required to achieve convincing conclusions. Future studies need to overcome the methodological flaws and examine the effectiveness of written CF in both cognitive information processing and interactionist perspectives, so that the full picture of how written CF contributes to L2 development could be displayed.

This chapter has provided a synthetical and critical review of written CF studies. They have either been conducted in a cognitive information processing framework, measuring the effectiveness of written CF on a group of participants’ accurate use of certain linguistic types in revisions and new written texts over time; or in an interactionist framework, proposing the scaffolded written CF might result in

desired L2 development. However, more questions have been raised than have been answered in studies of both of approaches. That has led to the rationale of my study.

3.9 Rationale of the present study and research questions

The theoretical support from the SLA theories reviewed in Chapter 2 encouraged me to carry on exploring the effectiveness of written CF on L2 development. Additionally, the theoretical explanations on the potential impacting factors during L2 development made me interested in investigating the factors which may affect the facilitative role of written CF on L2 development. The review of existing studies in this chapter has shown the effectiveness of more explicit types of written CF on the development of a very limited number of simple rule-based linguistic types. Is written CF able to facilitate L2 development on other linguistic types, especially on very complex and idiosyncratic linguistic types? What is the relationship between the degree of explicitness of written CF, error type, and learners' individual differences? These questions need to be answered by conducting carefully-designed studies.

It has to be noted that the existing written CF studies were mostly conducted in an ESL context. Having been an EFL teacher in China for a few years, I have witnessed EFL students' desire to receive feedback from teachers and improve their written accuracy. Besides, English teaching in an EFL context (at least in mainland China) has been very focused on grammar and grammatical accuracy. Thus, a Chinese EFL context might be a very good platform to investigate the effectiveness of written CF. My study first intended to investigate several important factors which may have an impact on the effectiveness of written CF. The widely-used written CF types of varying degrees of explicitness were examined in this study, and the errors that often occur in an EFL context were targeted. Furthermore, L2 proficiency level as one of the important moderating factors (theoretical discussions see Section 2.3.4) was investigated in this study. The following research questions will be first addressed:

RQ1: Does written CF enable Chinese EFL learners to use targeted linguistic types more accurately in new writing tasks over a period of four months?

RQ2: Is the effectiveness of written CF dependent upon its degree of explicitness (underlining, error code, metalinguistic explanation, direct correction, direct correction plus metalinguistic explanation)?

RQ3: Is written CF more effective in targeting certain linguistic errors (regular past tense, irregular past tense and prepositions indicating space)?

RQ4: Does the proficiency level (higher and lower) of Chinese EFL learners determine how effective written CF is for improving the accuracy of (a) regular past tense, (b) irregular past tense and (c) prepositions indicating space in new writing tasks over a period of four months?

A follow-up case study was conducted after the quantitative study. The individuals who received different types of written CF but did not show accuracy improvement in the immediate post-test were looked at closely and each individual was provided with scaffolded written CF. The following questions will be address in the case study:

RQ5: To what extent does no accuracy improvement in the immediate post-test mean that one session of written CF treatment has been not beneficial for Chinese EFL learners?

RQ6: To what extent does the provision of scaffolded written CF facilitate improved accuracy for Chinese EFL learners who failed to benefit from a single written CF treatment?

CHAPTER 4

METHODOLOGY

4.1 Introduction

This chapter outlines the philosophical worldview (Creswell, 2009), the research approach which is related to the worldview, and the specific research design best suited to address the research questions set out in Chapter 3. Section 4.2 explains the methodological approach, which is underpinned by postpositivism. Postpositivism is a deterministic philosophy in which causes determine effect or outcome (Creswell, 2009); therefore, explanatory sequential mixed methods were chosen as the research approach, including a quantitative study and a follow-up multiple case study. Section 4.3 elaborates on the specific research design of the quantitative study. A large-sample quasi-experimental study was designed to address RQs 1-4, which investigate moderating factors on the effect of one session of written CF. Section 4.4 presents the sequential multiple case study, investigating whether or not and why some learners fail to benefit from one session of written CF; and whether or not scaffolded written CF could result in L2 development. Both of the sections start with an overview of the study design, and with the explanation and justification of setting and participants, targeted linguistic error types, written CF treatment and instruments. Each section also includes an illustration of the specific process of data collection, an overview of methods used for data analysis followed by study trustworthiness.

4.2 Methodological approach

The postpositivist worldview is the philosophical idea espoused in this research. Postpositivist assumptions have represented the traditional form of research and are also called the scientific method. However, it also challenges the traditional notion of the absolute truth of knowledge (Phillips & Burbules, 2000) and recognizes that we cannot be positive about our claims of knowledge when studying the behaviour and actions of humans (Creswell, 2009). “Postpositivists hold a deterministic philosophy in which causes (probably) determine effect or outcome” (p. 7); thus,

they often reduce the possible causes into a small discrete set to test in (quasi)experiments. However, they also develop their knowledge based on careful observation and measurement of the objective reality and studying the behaviour of individuals becomes paramount for them. In this way, the theories or hypotheses can be tested and verified, and necessary revision or additional tests can be made.

Predictions have been made based on the theoretical foundations for written CF research reviewed in Chapter 2 that the degree of explicitness of written CF, the targeted linguistic error type and learner's proficiency level might play a role in the effectiveness of written CF. Therefore, these factors needed to be tested to investigate whether or not and the extent to which they have an impact on the effectiveness of written CF. As mentioned before, postpositivists also develop their knowledge based on the study of individuals, and thus the investigation of individual cases is needed to see whether or not there is any difference between some individuals and the experimental groups.

Because of this, explanatory sequential mixed methods (Creswell, 2009) were chosen as the research approach, in which quantitative research is first conducted, and then qualitative research is conducted, based on the analysis of the results of the quantitative research. In this way, the initial quantitative data results could be explained further with the qualitative data (Creswell, 2009). To accomplish this in the current research, a large-sample quasi-experimental was designed to address RQs 1-4, investigating the effectiveness of written CF and the moderating role of the degree of explicitness of written CF, the targeted linguistic error type, and the learner's proficiency level. Although previous written CF studies, which were based on the response of a group of students to written CF, have reported improved accuracy after one session of written CF treatment, it cannot be assumed that each of the participants has benefited from it. Therefore, looking at the individuals who do not benefit from one session of written CF may help present a more complete picture of the role of written CF in L2 development. Therefore, a follow-up multiple case study was designed to look at some of the individuals who did not benefit from one session of written CF treatment, and to investigate whether or not insufficiently explicit written CF might be a reason for their failure to benefit, and

whether or not scaffolded written CF might result in improved accuracy over time (RQs 5-6). The details of the main study, the quasi-experimental study, are described in Section 4.3, followed by an overview of the multiple case study in Section 4.4.

4.3 The main study

The main study was a quasi-experimental study involving six intact classes were randomly assigned to experimental groups and a control group. It was designed to investigate whether or not and the extent to which written CF provided on targeted linguistic errors could play a role in helping Chinese EFL students use the targeted linguistic types more accurately in new written texts over time. The study also examined the effect of several variables on written CF: 1) the degree of explicitness of written CF (underlining, error code, metalinguistic explanation, direct correction and direct correction plus metalinguistic explanation), 2) linguistic error type (regular past tense, irregular past tense and prepositions indicating space), and 3) learner's proficiency level (higher and lower).

4.3.1 Setting

The study was conducted in six intensive English classes at Baoji University of Arts and Sciences in China. According to the teachers, the foci of the intensive English class were learning vocabulary, understanding sentence structures and improving reading skills. In the intensive English class, students were also required to practise writing (a short piece of narrative writing) every two weeks. Teachers provide feedback on students' writing, but the feedback is not necessarily systematic or consistent. Some of the errors may be pointed out, some may be ignored; some of the errors may be underlined, some may be directly corrected. For these students, English accuracy, especially English written accuracy, is important because they have to pass an English exam each semester and at the end of the second year of university, they have to pass the CET-4 (College English Test Level 4). The CET-4 is to test whether or not the students have acquired sufficient English knowledge to understand basic English and communicate effectively in written form (National College English Testing Committee, 2006). Passing the CET-4 and having the certificate bring a lot of advantages for the students' future career possibilities.

4.3.2 Participants

In total, 181 first year non-English major students in the Politics and Law Department participated in the main study. All of them were 18-20 years of age and had just enrolled at the university (only for 2 months when the study was conducted). English instruction for these non-English major university students mainly focuses on English knowledge, and provides very limited opportunities of English knowledge use in writing and speaking. The participants were generally regarded at pre-intermediate level, but their English knowledge and ability of English use varied to a large extent, which had been shown in the National Matriculation English test (the highest score is 131 and the lowest is 63). Thus, it would be possible to investigate whether or not English proficiency level is a moderating factor on the effect of written CF. First year university students may have more motivation and enthusiasm for study as they have made considerable effort to be admitted into university, and for this reason, it might be expected that they put in more effort to do the writing tasks and attend to the written CF. Therefore, sufficient words in the writing tasks and noticeable improved accuracy after written CF treatment might be expected.

4.3.3 Study design

As can be seen in Figure 4.1, the main study employed a design with a pre-test (week 1), written CF treatment session (week 3), immediate post-test (week 3), and two delayed post-tests (week 7 and week 19).

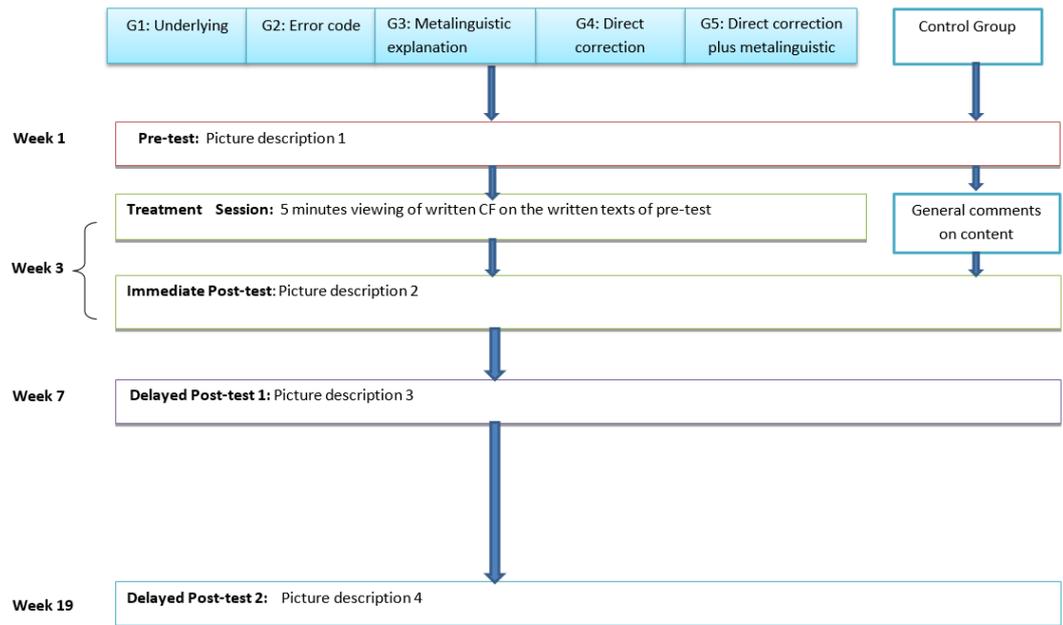


Figure 4.1. Design of the main study.

Six intact classes were randomly assigned to five treatment groups (i.e. underlining, error code, metalinguistic explanation, direct correction, and direct correction plus metalinguistic explanation) and a control group, and in the pre-test the participants of the six groups wrote a picture description (W1) (details see Section 4.3.5). After two weeks, the five treatment groups received different types of written CF on the targeted linguistic errors in the texts of the picture description (W1), and the control group received general comments on the content. Participants had five minutes to look at the written CF or the comments, followed by the immediate post-test, in which all six groups were asked to describe a different picture (W2) than the first one. In order to investigate the extent to which the effect of written CF could be retained over time two delayed post-tests were conducted in week 7 and week 19. In delayed post-test 1, the participants were asked to describe a third picture (W3). Then in the delayed post-test 2 in week 19, the last picture description task (W4) was assigned to the participants to examine the long-term effect of written CF.

4.3.4 Targeted structures

The regular past tense, irregular past tense, and prepositions indicating space were selected as the targeted linguistic error types in this study and the following sections explain the reasons.

4.3.4.1 Regular and irregular past tense

In SLA and CF literature, it has been argued that no single form of correction can be expected to help the acquisition of all linguistic types (Truscott, 1996). Although there is growing evidence supporting the effectiveness of written CF on facilitating the development of a number of grammatical forms, different levels of improvement have been reported regarding different error types (e.g. Bitchener et al., 2005; Ferris, 2006; Ferris & Roberts, 2001). The differential effect of written CF was explained initially by Ferris' (1999) distinction of the *treatability* of errors. Yang & Lyster (2010) further categorized *rule-based* and *item-based* errors by referring to Ellis' (2005a) work. *Rule-based* errors can be resolved by referring to a set of rules, while *item-based* errors are more idiosyncratic and grammatical rules can less likely be referred to to resolve the errors. The past simple tense was chosen in this study because, as has been pointed out by Yang & Lyster (2010), regular past tense forms are more rule-based as they are normally formed by adding *-ed* to the infinitive verb forms, although some of the verbs require doubling the last consonant letter (e.g. *hopped*), and some require the ending letter *y* to be changed into *i*, and *-ed* added (e.g. *cried*). On the contrary, irregular past tense forms are more item-based because there are no general rules to refer to when making the irregular past tense forms. For example, the past simple tense for *sit* is *sat*, while for *forget* it is *forgot*. Therefore, including both the regular and irregular past tense forms in this study made it possible to investigate the differential effect of written CF on facilitating learners to develop their use of rule-based and item-based errors.

The past simple tense was chosen also because Chinese EFL students, even at intermediate or advanced levels, are still unable to gain full control over its use even though it has been introduced to them early in their language studies (Bitchener et al., 2005; Ellis, Loewen, & Erlam, 2006; Master, 1995). Bitchener and his colleagues (2005) found the past simple tense was the second most recurrent error category out of 29 error types in the written text of 53 post-intermediate ESOL

learners (predominantly mainland Chinese). As regular and irregular past tense uses are often only partially grasped and incorrect uses often occur, it seemed likely that the students in this study may make errors when writing. Thus it made providing written CF and investigating the effect of written CF on linguistic types possible.

4.3.4.2 Prepositions indicating space

Prepositions are difficult to learn and ESL/EFL learners still struggle with prepositions even after they have achieved a high proficiency level (Celce-Murcia, Larsen-Freeman, & Williams, 1999). Bitchener, Young, & Cameron (2005) found 29.23% of the errors in students' writing were prepositions errors, which was the most recurrent error out of 29 error categories. The difficulty of learning prepositions may lie in the complex nature of prepositions. The above section has discussed the rule-based nature of regular past tense and item-based nature of irregular past tense. However, it is hard to categorize prepositions into either of the groups. Unlike irregular past tense where no general rules can be referred to, there are some rules for the use of prepositions. For example, *in* denotes the enclosure of one entity in the other entity and, therefore, views the other entity as a two- or three-dimensional space. *On* denotes physical contact between the two entities, and the latter entity is viewed as a one-dimensional space (a line) or two-dimensional space (a surface) (Celce-Murcia et al., 1999). However, there are so many prepositions which are slightly different in meaning, for example, *meet me at (general area) the office* but *she is in (enclosure) her office*. Thus, on the one hand, it may be difficult for learners to understand the slightly different scenario on various spatial relationships; On the other hand, it may not be easy for learners to remember and apply the detailed rules correctly in speaking and writing.

Prepositions are generally used to indicate space, time and degree (Celce-Murcia et al., 1999). In my study, only prepositions indicating space were targeted for several reasons. Firstly, prepositions indicating space make up the largest prepositions group among the three. Secondly, the writing task of picture description could inevitably elicit the use of prepositions indicating space as the participants had to write about the location of the objects and people when describing what happened in the pictures. Thirdly, prepositions indicating space are very important in daily

communication; thus it is worth spending time and effort for the learners to learn and use prepositions indicating space accurately.

Due to the different and complex nature of the three targeted linguistic error types, it could be expected learners would experience different levels of difficulty and accuracy when using them, which made the comparison of the effect of written CF on different linguistic error types an important focus of the study.

4.3.5 Instruments

The instruments used to collect the data were four writing tasks. Four writing tasks were assigned to the participants in a pre-test, immediate post-test and 2 delayed post-tests respectively. Each of the four writing tasks required a description of what happened in a picture (1. *A Sunday Afternoon*, 2. *A Sunny Morning*, 3. *A Corner of Street*, 4. *My Winter Trip*) (See Appendix G). Picture description was chosen because it is regarded as an approximate authentic communication activity in ESL classrooms (Bitchener & Knoch, 2010a) and it provides a lot of information for students to write about. Therefore, students would not have too much difficulty or spend too much time thinking about what to write. Also, when describing what happened in the picture, it was unlikely that the students would be able to avoid using prepositions indicating space and the past simple tense. Having been aware that students might tend to use the past continuous tense, the researcher explained that they were to write about *what happened* instead of *what was happening*.

Before each writing task, the researcher explained the writing instructions. The participants were asked to describe what happened in the picture. Also, they were asked to describe the location of the people and objects in the picture. On each testing occasion, participants were given 40 minutes to write 150 -200 words.

4.3.6 Treatments

In week 3, the written CF treatment was provided. As mentioned in the study design (see Figure 4.1 in Section 4.3.3), five out of the six classes were treatment groups and one class was the control group. One of five written CF strategies (underlining, error code, metalinguistic explanation, direct correction and direct correction plus metalinguistic explanation) was randomly assigned to each of the five treatment

groups. These five written CF strategies were examined for theoretical, empirical and pedagogical reasons.

As has been explained in Chapter 2, the degree of explicitness of written CF may have an impact on its facilitative role on L2 development. As a form of input, the information contained in different written CF types varies, so the extent to which it could result in the development of explicit knowledge may vary. As a noticing-trigger, written CF with different degrees of explicitness may lead to the consolidation of explicit knowledge to different extents (see Section 2.3). Empirically, no conclusion has been made on the differential effectiveness of various types of written CF (see Part A in Chapter 3). To date, there has been not a single study that has compared all the written CF types of various degrees of explicitness. To investigate all the frequently examined written CF types in one study may reveal more convincing evidence on the differential effect of written CF due to the various degrees of explicitness. Pedagogically, the thorough examination of the widely used written CF types may help teachers make decisions on how to choose effective written CF types for students.

For the reasons above, all of the written CF types were examined in this main study. In the treatment session, all five treatment groups received different written CF types on all the targeted linguistic errors (regular past tense, irregular past tense and prepositions indicating space). The operationalization of the five types of written CF is explained below with examples.

Group 1: underlining

In this group, the students' targeted linguistic errors were only underlined by the researcher, and no further information was provided, as illustrated below.

G1: underlining

Examples: 1) She stoped crying.

2) He were late for school yesterday.

3) The dog is sleeping in the floor.

Group 2: error code

Since three error types were targeted in this study, there were three error codes. **RPT** is the error code for regular past tense, **IPT** stands for irregular past tense and **PS** means prepositions indicating space. Students in this group received error codes for the underlined errors, which indicated the nature of the errors. Furthermore, at the bottom of the writing sheet, the meaning of the error code was provided, as illustrated below.

G2: error code

Examples: 1) She stoped **RPT** crying.

2) He were **IPT** late for school yesterday.

3) The dog is sleeping in **PS** the floor.

At the end of the sheet:
RPT = regular past tense **IPT** = irregular past tense **PS** = prepositions indicating space

Group 3: metalinguistic explanation

In this group, students' errors were underlined and three symbols were used to indicate the nature of the errors: * for regular past tense, # for irregular past tense and **o** for prepositions indicating space. At the bottom of each writing sheet, the metalinguistic explanation of why it was an error or how to use it correctly, along with an example, were provided for each of the error types (See illustrations below).

G3: metalinguistic explanation

Examples: 1) She stoped *crying.

2) He were # late for school yesterday.

3) The dog is sleeping in **o** the floor.

At the end of the sheet:
* *stop* is a regular past tense form, but the rule is to double the ending consonant letter and then add -ed. *e.g.* Alice hopped off the bus.

were is not the correct irregular past tense to be used after the third person singular pronoun. *e.g.* Joe was here just now.

O *in* denotes the enclosure of the object in a three-dimensional space. However, *the floor* is a two-dimensional space (a surface). *e.g.* The dish is in the box.

Group 4: direct correction

Participants in this group received correct forms along with the targeted errors underlined, as illustrated below.

G4: direct correction

Examples: 1) She stoped stopped crying.

2) He were was late for school yesterday.

3) The dog is sleeping in on the floor.

Group 5: direct correction plus metalinguistic explanation

Participants in this group not only received the correct form beside each of the errors, but at the bottom of the writing sheet, a metalinguistic explanation with an example for each underlined error was also provided (see illustrations below).

G5: direct correction plus metalinguistic explanation

Examples: 1) She stoped * stopped crying.

2) He were # was late for school yesterday.

3) The dog is sleeping in o on the floor.

At the end of the sheet:

* *stop* is a regular past tense form, but the rule is to double the ending consonant letter and then add -ed. *e.g.* Alice hopped off the bus.

were is not the correct irregular past tense to be used after the third person singular pronoun. *e.g.* Joe was here just now.

O *in* denotes the enclosure of the object in a three-dimensional space. However, *the floor* is a two-dimensional space (a surface). *e.g.* The dish is in the box.

Control group: general comments

Participants in the control group did not receive any written CF on their pre-test written texts; instead, they received some general comments on the content. For example, *Your description of the picture is very detailed and vividly presents what happened at that moment.* The researcher commented on the students' writing content because she wanted the students to know their texts were read and to keep them involved in the study. No response at all might have discouraged and demotivated the students.

4.3.7 Data collection Procedures

Before starting the data collection, all the students' National Matriculation English scores were recorded as an indicator of the proficiency level. The data collection procedures for each stage of the study design (as outlined above in Figure 4.1) are described in this section.

4.3.7.1 Pre-test (week 1)

All the students in the six groups were assigned the first writing task (W1), and were asked to write about what happened in the picture, *A Sunday Afternoon*, in 150-200 words within 40 minutes. In the following 2 weeks, the researcher photocopied the written texts from the first writing task (W1), identified and calculated the errors and the correct uses of the targeted linguistic features and provided feedback on the targeted errors in the original written texts.

4.3.7.2 Treatment (week 3)

The treatment session took place two weeks after the pre-test. The original written texts (W1) with different feedback were returned to the six groups in week 3. Group 1 received underlining, Group 2 received error code, Group 3 received metalinguistic explanation, Group 4 received direct correction, and Group 5 received direct correction plus metalinguistic explanation. All five experimental groups were given 5 minutes to look at the written CF, and the control group had a look at the general comments at the same time.

4.3.7.3 Immediate post-test (week 3)

Five minutes later, after the students finished viewing the feedback, the written texts with feedback were taken away and all six groups were assigned the second writing task (W2). The participants were asked to describe another picture, *A Sunny Morning*. Once again they were given 40 minutes to write 150-200 words. After writing, the researcher collected the written texts (W2). The errors and correct uses of the targeted linguistic types in the written texts (W2) were identified by the researcher. Since this investigation only looked at the effect of one treatment of written CF, no written CF was provided for the students on the written texts from the immediate post-test (W2).

4.3.7.4 Delayed post-test 1 (week 7)

In order to investigate whether or not any effectiveness of written CF revealed in the immediate post-test could be retained over time, delayed post-test 1 (W3) was conducted four weeks after the treatment. Participants were assigned a third picture, *A Corner of Street*, and given 40 minutes to write 150-200 words. The researcher identified the correct uses and the errors of the targeted linguistic types and calculated the accuracy rates after collecting the written texts (W3). No written CF was provided for the students on the written texts from the delayed post-test 1 (W3).

4.3.7.5 Delayed post-test 2 (week 19)

In order to further investigate whether or not the effectiveness of written CF could be retained over a longer period of time, delayed post-test 2 (W4) was conducted sixteen weeks after the treatment. In week 19, the participants were assigned the last piece of writing (W4) with the same requirements but a different picture, *My Winter Trip*, to describe. After collecting the written texts, the researcher identified the correct uses and the errors of the targeted linguistic types in the written texts (W4).

4.3.8 Data analysis

Correct and incorrect uses of the three targeted linguistic features in each written text were identified and an obligatory occasion analysis was used to calculate the accuracy rate. That is, the accuracy on each occasion was calculated as a percentage of correct usage for all occasions where the grammatical form of the sentence written by the student required it (for a discussion of obligatory occasion analysis, see Ellis & Barkhuizen, 2005). For example, on any one text, three correct uses of the targeted linguistic type from ten obligatory occasions meant a 30% accuracy rate.

Out of 181 participants, only 157 participants went through all the testing sessions. Twenty-four participants were absent for one or more writing tasks due to not attending class for various reasons. Furthermore, because two participants from each of the five treatment groups later took part in the case study and received more written CF in the follow-up case study, the data from those ten students were excluded. Thus, the data collected from the writing tasks of 147 students were

computed in SPSS. One-way ANOVA tests were conducted to investigate the between-group differences in the pre-test when the three linguistic categories were considered as a group and separately. The between-group difference was found when prepositions indicating space was looked at alone. Therefore, in order to take account of the variability in the pre-test, Analyses of Covariance (ANCOVA; with pre-test accuracy rate as the covariate) was computed to investigate the extent to which the group differences on the three post-tests were statistically significant (Pallant, 2013). In order to keep the consistency of the tests, ANCOVA was used for the other two linguistic categories as well.

To address the first three research questions about whether or not and the extent to which written CF helped the participants to use the targeted linguistic types more accurately over time and whether or not the effect of written CF varied due to the differences in the explicitness of written CF and error type, ANCOVAs were used to test for between-group accuracy differences in the immediate post-test, delayed post-test 1 and delayed post-test 2. The ANCOVA models contained written CF type as the between-subject factor, accuracy rate in pre-test as the covariate, and the accuracy rate in each post-test as the dependent variable. The effect of written CF on the targeted linguistic types combined was first examined, thus ANCOVAs were run containing written CF type as the between-subject factor, the accuracy rate of three linguistic types combined in the pre-test as the covariate, and the accuracy rate of three linguistic types combined in each post-test as dependent variables. When examining the effect of written CF on each of the linguistic types, ANCOVAs were run with the same between-subject factor, but with the accuracy rate of each targeted linguistic type respectively in the pre-test as the covariate, and the accuracy rate of each linguistic type respectively in each post-test as dependent variables.

To address RQ4, investigating whether or not the participants' proficiency level (higher and lower) had an effect on the use of written CF over time, the participants' National Matriculation English scores were recorded and the mean was calculated (Mean = 102). According to the mean (102), the participants whose scores were no less than 102 were put into higher proficiency group (N = 83, Mean = 111.07), while the participants whose scores were less than 102 were put into lower

proficiency group (N = 64, Mean = 90). Thus, proficiency level (higher and lower) was added to the ANCOVA models as another between-subject factor. That is, the ANCOVA models contained written CF type and proficiency level as between-subject factors, accuracy rate in the pre-test as the covariate, and the accuracy rate in each post-test as the dependent variable. The effect of written CF and proficiency level on each targeted linguistic type were examined, thus ANCOVAs were run containing written CF type and proficiency level as between-subject factors, the accuracy rate of the three linguistic types respectively in the pre-test as the covariate, and the accuracy rate of three linguistic types respectively in each post-test as dependent variables.

4.3.9 Study validity and reliability

The validity and reliability of the main study was established during both the data collection and the processing of the collected data. Validity means that the study reflects what it is believed to reflect and the significance can be expanded to a broader, relevant population. Internal and external validity are the most common areas of concern (Mackey & Gass, 2005). Mackey & Gass (2005) defined that “internal validity refers to the extent to which the results of a study are a function of the factor that the researcher intends” (p. 109). As mentioned before, the writing tasks were designed to elicit the targeted linguistic types (regular and irregular past tense and prepositions indicating space). These targeted linguistic types had been taught at the early stage of their English study (middle school), but the instruction on basic grammar and linguistic features is not included in university-level English teaching. Instead, the comprehension of complex and complicated sentence structures and the learning of new words are the focus. As a result, it is very unlikely that instruction on the targeted linguistic types had been provided in class during the study. As the participants were non-English majors, it is also unlikely that they would spend additional time on English study. Therefore, the participants’ improved accuracy regarding the targeted linguistic types probably indicates the effectiveness of written CF.

The concern of external validity is the generalizability of the findings, or that extent to which the findings of the study are relevant to a wider population of language

learners (Mackey & Gass, 2005). The participants in the study were not completely randomly selected. And it is clear that second language researchers do not have access to the entire population, even in a particular context (Mackey & Gass, 2005). The participants were selected because they just enrolled in university (two months when the study was conducted), thus it is very likely they still maintained the proficiency differences, which may make the investigation of the moderating role of proficiency level possible. In addition, these participants had the English instruction by the same teacher, so that other possible variables could be filtered out. Last but very importantly, these participants could represent a wide population of FL/EFL learners, who mainly develop their language knowledge via formal instruction and do not have easy access to the target language in daily life. To conclude, the sampling and design of the quasi-experimental study ensured the high validity of the findings.

Reliability refers to consistency, often meaning instrument consistency. It includes rater reliability and instrument reliability (Mackey & Gass, 2005). The reliability of the data processing was guaranteed by inter-reliability calculations, which were performed by a trained analyst and revealed a 98% agreement on the identification of targeted errors and a 100% agreement on the assignment of errors to the targeted categories. The choice of the statistical tests for the main study was made with the help of an AUT University statistician and the tests were run under his supervision. The instrument reliability was guaranteed by test-retest in the pilot study. The original narrative writing prompts were first tested in the pilot study and it was found that the targeted linguistic types had not been successfully elicited. Therefore, four picture writing tasks were chosen and tested on two participants respectively in one month. It was found all the three targeted linguistic types were used in all the written texts and thus, the four picture writing tasks were finalized as the study instruments.

As for the participants' proficiency level, the data came from the participants' National Matriculation English test. It is China's national examination and has a very good reputation for its validity and reliability in examining students' mastery of English knowledge. The English test covers listening, reading and writing, and

has a strong focus on the accurate use of English grammar (National College English Testing Committee, 2006). Therefore, the English score may, to a large extent, reveal the students' English capability, especially the capability to use English in the written manner. The participants in this study had been enrolled in university for less than two months; therefore, it is very likely that they still kept their differences in English capability. Thus, dividing the participants into higher and lower proficiency levels based on the students' the National Matriculation English scores was fairly valid and reliable.

4.4 Follow-up multiple case study

Case study research is to study an issue explored through one or more cases within a bounded system (i.e., a setting, a context) and a multiple case study involves exploring multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information (e.g., observations, interviews, recorded material, and documents, etc.). In a multiple case study, multiple cases are selected to illustrate the issue, which could provide an in-depth understanding of the cases or a comparison of several cases (Creswell, 2007). As has been discussed in Chapter 3, traditional written CF studies have mainly looked at how effective written CF was on a group of participants, but have paid less attention to whether or not some individuals did not benefit from written CF. After the main study which examined the effect of written CF on a group of participants, the follow-up case study was designed to focus on individual participants from each experimental group who did not show improved accuracy in the immediate post-test after receiving written CF and to investigate 1) to what extent reduced accuracy means one session of written CF treatment has been not beneficial for Chinese EFL learners and 2) to what extent the provision of scaffolded written CF facilitates improved accuracy for Chinese EFL learners.

4.4.1 Setting

As it is the follow-up study, the setting is the same as in the main study (see Section 4.3.1).

4.4.2 Participants

As has been mentioned in the main study, the accuracy rates of all three targeted forms were calculated both combined and separately in the pre-test (W1) and immediate post-test (W2). With the aim of investigating why some individual learners did not benefit from one session of written CF treatment and determining how to provide written CF to help them improve the accurate use of the targeted linguistic types, two participants in each of the five treatment groups whose overall accuracy had not increased in the immediate post-test were invited into the case study. Two participants instead of one were invited from each treatment group in case that some individuals failed to benefit from written CF only due to personal reasons, for example, not feeling well. Because there were no large differences between the two participants from each treatment group, the results of only one of the cases were reported in Chapter 6.

4.4.3 Study design

As can be seen in Figure 4.2, the case study was carried out in the middle of the main study (week 9), and consisted of a one-on-one intervention, an immediate effect test, and a long-term effect test. Two participants whose overall accuracy had not increased from each treatment group were invited to have a one-on-one intervention first on the written text of pre-test (W1), and then on the written text of the immediate post-test (W2).

During the intervention on the written text of the pre-test (W1), each participant was asked to correct each of the targeted linguistic errors with the written CF which had been provided in the treatment session in the main study. However, if the participant showed difficulty in arriving at the correct form, a more explicit type of written CF was provided until he/she could arrive at the correct form or the correct form provided by the researcher was understood by the participant (the written CF types were the five types of written CF tested in the main test, and the order showed increasing explicitness, starting with underling, then moving to error code, metalinguistic explanation, direct correction, and direct correction plus metalinguistic explanation).

During the intervention on the written text of the immediate post-test (W2), the participant was asked to identify and correct the errors without any assistance from the researcher. However, if the participant showed difficulty, scaffolded written CF was provided according to the ‘The Graduated Written CF Strategies’ (adopted from Aljaafreh and Lantolf’s (1994) ‘Regulatory Scale’) (details see Section 4.4.6).

Immediately after the one-on-one intervention, each participant was required to revise their written text (W3) of the delayed post-test 1 which had been completed two weeks prior in the main study, to test the immediate effectiveness of scaffolded written CF. After 10 weeks, the selected 10 individuals were assigned a new writing task (W4) with the aim of testing the long-term effectiveness of scaffolded written CF. The same writing task was assigned to the participants in the delayed post-test 2 of the main study at the same time, but to examine the retention of one session of five types of written CF over a four months period.

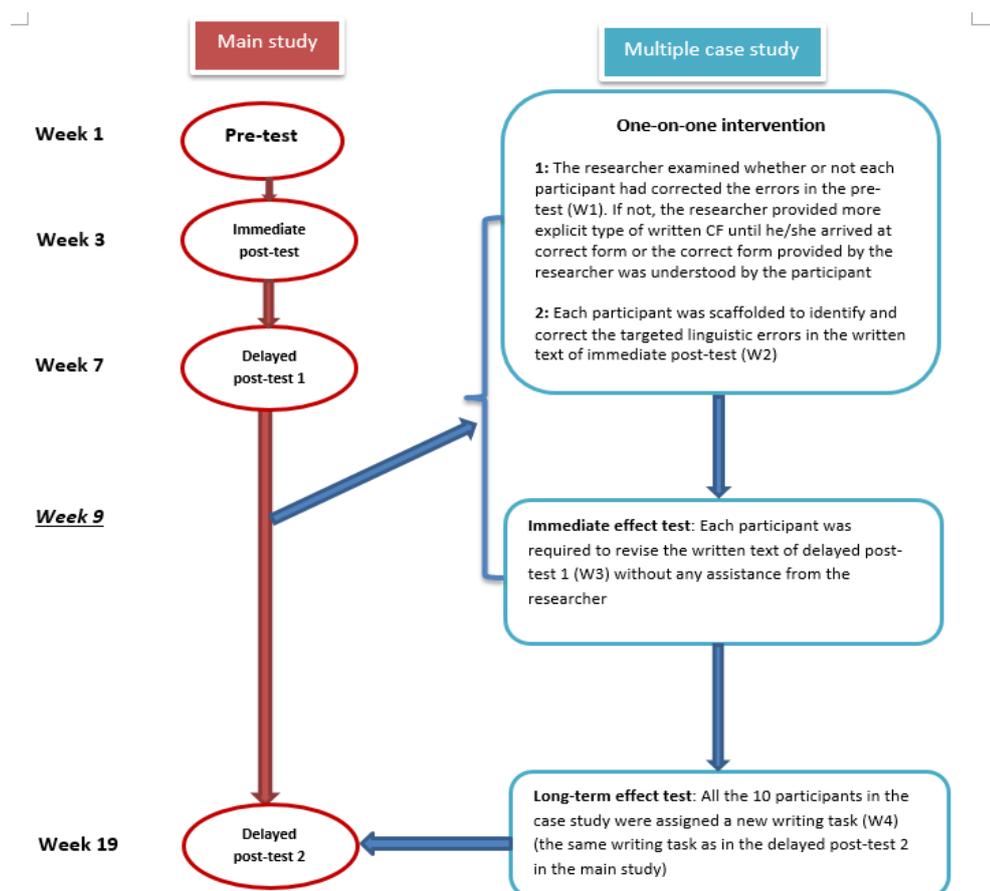


Figure 4.2. Design of the follow-up case study.

4.4.4 Targeted structures

As it was the follow-up study, the targeted linguistic types were the same as in the main study (see Section 4.3.4).

4.4.5 Instruments

The one-on-one intervention was based on the written texts of the pre-test (W1) and immediate post-test (W2). The immediate effectiveness test was the revision of the written text of delayed post-test 1 (R-W3). And the long-term effect test was the writing task of delayed post-test 2 in the main study (W4). Therefore, the instruments were the same as those in the main study (see Section 4.3.5).

4.4.6 Treatment

There were two sessions of treatment, which were slightly different.

1. *Treatment on the written text of the pre-test (W1)*: This session was carried out to investigate whether or not the participant's failure to benefit from the written CF provided was because the written CF they had received was not sufficient enough for them to produce the correct forms. Therefore, the treatment was provided when the participant showed difficulty in correcting the errors with the written CF which had been provided in the main study. If the participant corrected the errors alone, then no further assistance was provided. If the participant could not correct the errors, a more explicit written CF type was provided. For example, if the participant could not produce the correct form as a result of error code, *metalinguistic explanation* would be provided. However, during the one-on-one intervention, all the written CF types were provided in oral form. For the participants who had already received the most explicit written CF, *direct correction plus metalinguistic explanation*, if more help was needed, the metalinguistic explanation was rephrased and another example was provided.
2. *Treatment on the written text of the immediate post-test (W2)*: This session was carried out to investigate the exact written CF needed by each individual to identify and correct each of the targeted linguistic errors and whether or not there was any pattern of the written CF needed on certain linguistic types.

Therefore, the treatment was provided according to the ‘The Graduated written CF strategies’ (see Figure 4.3 below). There were two more strategies to direct the participant’s attention to the error before actual written CF was provided and all the written CF types were provided in oral form (see Section 4.3.6).

0. Researcher draws the learner’s attention to the sentence which contains an error (e.g. ‘Is there anything wrong with the sentence?’).
 1. Researcher narrows down the location of the error (e.g. ‘sit the horse?’)
 2. Researcher underlines the error
 3. Researcher indicates the nature of the error
 4. Researcher provides metalinguistic explanation
 5. Researcher provides the correct form
 6. Researcher provides additional metalinguistic explanation when the learner shows difficulty understanding the correct form
- *Strategies 2-6 see Section 4.3.6*

*Figure 4.3. The Graduated Written CF Strategies. Adapted from From “Negative feedback as regulation and second language learning in the zone of proximal development,” by Aljaafreh and Lantolf, 1994, *The Modern Language Journal*, 78(4), p. 471. Copyright 1994 by The Modern Language Journal. Reprinted with permission.*

4.4.7 Data collection procedures

There were three main steps in the case study: first a one-on-one intervention in week 9, followed by an immediate effect test immediately after the one-on-one intervention on the same day in week 9, and then a long-term effect test in week 19.

4.4.7.1 One-on-one intervention (week 9)

The researcher made an appointment with each of the ten participants on Day 3 in Week 9 and had a 30-minute one-on-one meeting with them one at a time. The one-on-one meeting with each of the participants was audio-recorded and there were two sessions.

Session 1: The researcher handed back the written text of the pre-test (W1) to the participant and examined whether or not he/she could correct the targeted linguistic

errors with the written CF which had been provided in the main study (see Section 4.3.6). If the participant arrived at the correct form, the researcher asked about his/her understanding of the correct form to make sure the correct form was not just a guess; if the participant was not able produce the correct form or understand the correct form provided by the researcher, the researcher provided a more explicit type of written CF than the one he/she had received (see Strategy 2-6 in Figure 4.3). For example, if the participant had received *underlining* at the treatment session in the main study, but could not come up with the correct form from that written CF type, the researcher then provided a more explicit type of written CF, *error code*, to the learner to facilitate her/him arriving at the correct form. If difficulty was still shown, another more explicit type of written CF, *metalinguistic explanation*, would be provided. This would continue until either the participant arrived at the correct form or direct correction was provided by the researcher and the participant understood the correct form. The purpose of this step was to check whether or not the participant's failure to benefit from written CF in the immediate post-test was due to insufficiently explicit written CF and determine how explicit the written CF needed to be to facilitate the participant arriving at the correct form.

Session 2: The written text from the immediate post-test (W2) was given back to the participant and he/she was required to identify and correct the errors with the scaffolded written CF. That is, written CF was provided only when needed and provided according to 'The Graduated Written CF Strategies' (see Figure 4.3). The researcher first drew the participant's attention to the problematic sentence, that is, the sentence in which an error occurred. If the participant had difficulty identifying the error, the researcher would direct the participant's attention to the segment which contained an error. If the difficulty persisted, the error would be underlined by the learner, and then the written CF types would be provided with increasing explicitness if needed.

The purpose of this step is twofold. On the one hand, the researcher could investigate what scaffolding was needed by each individual to identify and correct each of the targeted linguistic errors. On the other hand, the researcher could identify whether or not there was any pattern of the written CF needed on different

linguistic types. For example, whether or not less explicit written CF was needed on regular past tense than on prepositions indicating space.

4.4.7.2 Immediate effect test (week 9)

Immediately after the one-on-one intervention, the participant was given back his/her written text of the delayed post-test 1 (W3). Before being handed back, the participant's written texts of the delayed post-test 1 (W3) had been photocopied and the accuracy had been calculated and recorded. Each of the participants was asked to revise the written text (W3) and the accuracy in the revised version (R-W3) was compared to the original written text (W3), which was written two weeks ago, to test the immediate effectiveness of scaffolded written CF.

4.4.7.3 Long-term effect test (week 19)

The long-term effectiveness test was conducted in week 19. The 10 participants in the case study, along with all the other participants in the main study, were assigned the delayed post-test 2 (W4) (see Section 4.3.7.5). However, for the multiple case study, this delayed post-test 2 was testing the effectiveness of scaffolded written CF over 10 weeks; while for the main study, it was used to test the effectiveness of one session of written CF (five written CF types) over 16 weeks' time.

4.4.8 Data analysis

For a case study, analysis consists of making a detailed description of the case and its setting and it is recommended that the multiple sources of data should be analyzed (Creswell, 2007). Stake (1995) advocates four forms of data analysis and interpretation in case study research: The researcher can seek a collection of instances from the data, hoping the issue-relevant meanings will emerge (*categorical aggregation*); the researcher can look at a single instance and draw meaning from it without looking for multiple instances (*direct interpretation*). Also the researcher can establish *patterns*, looking for a correspondence or similarities and differences between two or more categories; or the researcher can develop *naturalistic generalizations* from analysing the data, so that people can learn from the case either for themselves or to apply to a population of case.

In the multiple case study, the data analysis included both a qualitative and a quantitative component. And the data from the individual case is first interpreted (*direct interpretation*), and then the *categorical aggregation* is made to establish the *patterns* (including similarities and differences) among the multiple cases, so that the *naturalistic generalizations* based on the cases could be made.

The qualitative component consisted of an in-depth analysis of the one-on-one session transcripts. The purpose was to identify what kind of written CF was needed on each of the errors in both of the written texts (W1 and W2). In W1 and W2 respectively, the relevant episodes containing an error and written CF were first identified and accurate uses of the targeted linguistic types and the errors were recorded. Figure 4.4 presented an example of one of the episodes of scaffolded written CF.

R: Here, below the light. [underlining]

Helen: I changed to behind.

R: But it is not correct. What is the relation between the person and the light?

Helen: Below?

R: But below means in a lower position. E.g. My apartment is below Susan's. Isn't the light like an umbrella and the person is covered by it? So which word you use for it? What the umbrella? [metalinguistic explanation]

Helen: Hmm, kind of. But I only know below.

R: Ok. You should use **Under**. [direct correction]

Helen: U-n-d-e-r?

R: Yes.

Helen: Oh, I remember the difference between below and under now.

Figure 4.4. An episode of scaffolded written CF.

From the episode above, it can be seen that the scaffolded written CF on the prepositions indicating space was direct correction (Strategy 5 in The Graduated Written CF Strategies). Each written CF episode in W1 and W2 was analysed and the strategy was recorded to track the explicitness of the written CF needed in each

episode. The qualitative data also included the uses of the targeted linguistic types, both correct and incorrect before and after receiving written CF. They may reveal additional evidence or counterevidence of the effectiveness of written CF. Table 4.1 presents one of the participants' uses of the irregular past tense in the pre-test and immediate post-test.

Table 4.1

The use of irregular past tense in the pre-test and the immediate post-test

	<i>Errors</i>	<i>Correct uses</i>
Pre-test	They are (were), where are (were) the parents, they don't (didn't), it (was) warm	was (4) ,were, would
Immediate post-test	air is (was), everything is (was), he get (got), can (could)	was (2), were (4), got, went, couldn't, sang

(number)= time of uses

The quantitative component included the accuracy rates of each targeted linguistic type in the delayed post-test 1 (W3), revised delayed post-test 1 (W3-R), and delayed post-test 2 (W4). The delayed post-test 1 (W3) was regarded as the pre-test before the participant received scaffolded written CF; revised delayed post-test 1 (W3-R) was used to test the immediate effectiveness after the participant received scaffolded written CF; and delayed post-test 2 was used to test the long-term effectiveness of the scaffolded written CF. The accuracy rate was also calculated using an obligatory occasion analysis, as in the main study (see Section 4.3.8). Table 4.2 presents the accuracy rates of one of the participants throughout these testing occasions.

Table 4.2

The accurate use of the targeted linguistic types throughout the testing occasions

	<i>Regular past tense</i>			<i>Irregular past tense</i>			<i>Prepositions indicating space</i>			<i>Total %</i>
	<i>Error</i>	<i>OC</i>	<i>%</i>	<i>Error</i>	<i>OC</i>	<i>%</i>	<i>Error</i>	<i>OC</i>	<i>%</i>	
Pre-scaffolded written CF test (W3)	0	7	100	2	13	84.62	4	8	50	78.21
Immediate effect test (R-W3)	0	7	100	2	13	84.62	2	8	75	86.54
Long-term effect test (W4)	3	9	66.67	1	10	90	2	4	50	68.89

OC=obligatory occasion, %=accuracy percentage

4.4.9 Validation and reliability

Different from quantitative research, various terms are used to refer to the assessment of the accuracy of the findings of qualitative research, including “validation”, “authenticity” and “credibility” (Creswell, 2007). In this thesis, “validation” used by Creswell (2007) is chosen and Creswell and Miller (2000) have suggested eight validation strategies to guarantee the accuracy of the findings, which means that the findings have been best described by the researcher and the participants. The strategies include prolonged engagement, peer review, external audits, etc. (e.g. Creswell, 2007) and it is recommended that qualitative researchers engage in at least two of them in any given study. Two validation strategies were used in my follow-up multiple case study to guarantee the validation, that is, *triangulation*, in which multiple and difference sources, methods, investigators, and theories are used to provide corroborating evidence (Ely, Anzul, Friedman, Gardner, & Steinmetz, 1991; Erlandson, Harris, Skipper, & Allen, 1993; Glesne & Peshkin, 1992; Lincoln & Guba, 1985; Merriam, 1988; Miles & Huberman, 1994; Patton, 1980, 1990); and *rich, thick description*, which allows readers to make decisions regarding transferability (Erlandson et al., 1993; Lincoln & Guba, 1985; Merriam, 1988).

During the case study, two cases instead of one, from each treatment groups were selected and not only their written texts but also their response to written CF (audio-recorded) were used to investigate whether or not and the extent to which written CF could contribute to their L2 development. The rich description of how each individual participant responded to written CF in the related episodes could provide corroborating evidence on when and how written CF could result in L2 development.

Reliability in qualitative research can be enhanced by the detailed fieldnotes by employing good equipment for recording and by transcribing the record (Creswell, 2007). The process of the multiple case study was recorded by good-quality voice recorder and the transcription of the recording was checked by a trained analyst (as

mentioned in Section 4.3.9). She checked the related episodes which were used in data analysis and our agreement on the coding was 99%.

4.4.10 Ethical considerations

During the data collection for both the quasi-experimental and the follow-up multiple case study, privacy and confidentiality were respected in accordance with the ethical guidelines and procedures issued by Auckland University of Technology Ethics Committee (AUTEK). The consent was obtained from the participants, the teacher and the dean of English department of Baoji University of Arts and Sciences prior to the commencement of the study (Ref. 11/269). All the parties involved in the study were informed of the purpose of the study and what their participation would entail.

CHAPTER 5

MAIN STUDY: RESULTS AND DISCUSSION

5.1 Introduction

The findings for RQ1, RQ2, RQ3 and RQ4 are presented in this chapter. RQ1 investigated whether or not written CF enabled Chinese EFL learners to use targeted linguistic types more accurately in new writing tasks over time; RQ2 investigated whether or not the effectiveness of written CF varied as a result of the degree of explicitness (underlining, error code, metalinguistic explanation, direct correction and direct correction plus metalinguistic explanation); RQ3 investigated whether or not the effectiveness of written CF differed on each of the targeted linguistic types; and RQ4 investigated whether or not the proficiency level (higher and lower) of the learners had an effect on the use of written CF to improve accuracy in new writing tasks over time.

As mentioned in the Methodology chapter, ANCOVAs were used to test for between-group differences in the immediate post-test, delayed post-test 1 and delayed post-test 2. To address RQ1 and RQ2, the ANCOVA models contained written CF type as the between-subject factor, the learner's pre-test performance on the targeted linguistic types combined as a covariate, and the performance of each of the post-tests regarding the targeted linguistic types combined as a dependent variable. To address RQ3, the learner's pre-test performance regarding each of the targeted linguist types was incorporated in the ANCOVA models, and performance of each post-test on each of the targeted linguistic types was included as a dependent variable. To address RQ4, proficiency level was added to the initial ANCOVA models as another between-subject factor. In the following section, the relevant descriptive statistics and the findings regarding each research question will be presented successively.

Besides presenting the results, this chapter will also discuss the findings by referring to the theories and empirical studies reviewed in Chapter 2 and Chapter 3. The following sections are organized according to the four research questions of the

main study. In each section, the findings to the research question will be presented first, followed by the discussions of the findings.

5.2 Does written CF enable Chinese EFL learners to use targeted linguistic types more accurately in new writing tasks over a period of four months (RQ1)?

In order to address the first research question, the overall accuracy of all three combined targeted linguistic types and the accuracy of each targeted linguistic type in each of the four testing sessions (i.e., pre-test, immediate post-test, delayed post-test 1, and delayed post-test 2) were examined.

To examine the general effectiveness of written CF, regardless of the different nature of the targeted linguistic types, the overall accuracy of all three combined targeted linguistic types in each of the four testing sessions (i.e., pre-test, immediate post-test, delayed post-test 1, and delayed post-test 2) were examined first, and Table 5.1 displays the descriptive statistics for overall accuracy rates over the four testing periods for the five treatment groups and the control group.

Table 5.1

Mean scores and standard deviations by group and testing period (3 targeted types combined)

<i>Group</i>	<i>N</i>	<i>Pre-test</i>		<i>Immediate post-test</i>		<i>Delayed post-test 1</i>		<i>Delayed post-test 2</i>	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1.Underlining	25	57.82	18.14	67.79	17.52	65.11	17.74	72.62	13.72
2.Error code	24	60.41	16.44	72.96	14.12	69.51	15.30	64.49	19.08
3.Metalinguistic explanation	24	59.26	18.27	75.40	17.96	66.43	18.50	72.87	13.94
4.Direct correction	24	56.54	17.59	75.08	13.37	72.18	16.20	68.99	20.02
5.Direct correction plus metalinguistic explanation	23	62.12	19.68	77.10	14.02	71.74	15.75	75.40	14.73
6.Control	27	68.80	14.66	69.81	14.63	68.37	16.48	69.30	20.15

Figure 5.1 presents a visual illustration of the descriptive statistics. It can be seen that from the pre-test to the immediate post-test the accuracy of all five treatment groups increased sharply, but it then decreased to different extents in delayed post-test 1. Then, in delayed post-test 2, different patterns of improvement and decline occurred: the groups which received underlining, metalinguistic explanation, and direct correction plus metalinguistic explanation had higher accuracy than those in delayed post-test 1; while the groups which received error code and direct correction had lower accuracy than in delayed post-test 1. However, in delayed post-test 2, the accurate use of the three targeted linguistic types in all the treatment groups was higher than it was in the pre-test. Very little change was observed in the control group throughout the testing periods.

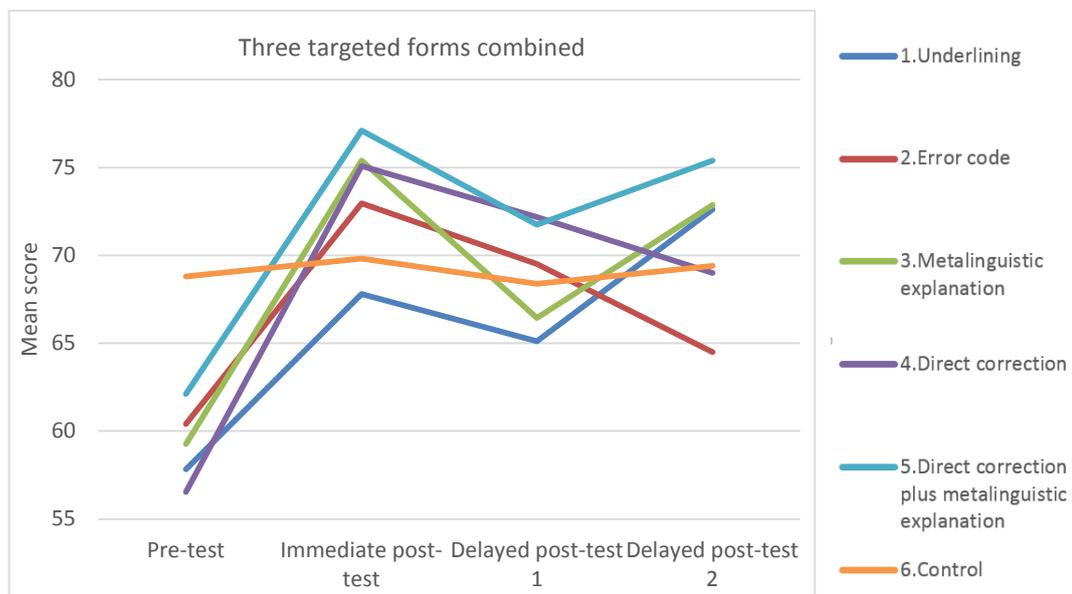


Figure 5.1. Performance over time after written CF provided on combined targeted linguistic types

As mentioned in Section 4.3.8 of the Methodology chapter, in order to test whether or not any of these differences were statistically significant, ANCOVAs were performed with the learner's overall accuracy in each post-test as the dependent variable, with written CF type as the independent variable and with the learner's overall accuracy in the pre-test as the covariate. The results showed that, controlling for the pre-test, there were significant differences in accuracy among the six groups

in the immediate post-test, $F(5, 140) = 3.19, p = .01, \eta^2 = .10$. Post hoc pair-wise comparisons revealed between which treatment groups and the control group the differences occurred, and the significant differences between them are summarized in Table 5.2.

Table 5.2

Summary of significant differences between treatment groups and the control group in the immediate post-test (3 targeted types combined)

<i>Group differences</i>	<i>Significance</i>
Metalinguistic explanation > Control	$p = .03$
Direct correction > Control	$p = .02$
Direct correction plus metalinguistic explanation > Control	$p = .01$

It can be seen from Table 5.2 that in the immediate post-test, the written CF groups (metalinguistic explanation, direct correction, and direct correction plus metalinguistic explanation) produced significantly higher accuracy than the control group. Therefore, the results revealed that written CF enabled the learners to use the targeted linguistic types more accurately in the immediate post-test. However, not all types of written CF resulted in significantly improved accuracy. Instead, only the more explicit types of written CF (metalinguistic explanation, direct correction, and direct correction plus metalinguistic explanation) enabled the learners to use the targeted linguistic types more accurately in the immediate post-test.

In order to examine the longer term effectiveness of written CF (four weeks), ANCOVAs were run with the overall accuracy rate in the delayed post-test 1 as the dependent variable, but no between-group differences were found to be significant, $F(5, 140) = 1.43, p = .22, \eta^2 = .05$.

In order to examine the effect of written CF over a four month period, ANCOVAs were run with the overall accuracy rate in the delayed post-test 2 as the dependent variable. However, the observed differences between the treatment groups and the

control group in delayed post-test 2 were not found to be significant, $F(5, 140) = 1.75, p = .13, \eta^2 = .06$.

The results of the immediate effectiveness of more explicit types of written CF not only lie within the theoretical expectation, but also confirm the findings of prior written CF studies. Gass' (1997) Computational Model has explained how a single episode of input processing can contribute to the development of explicit knowledge. When input is noticed and comprehended, it goes through central processing and ends with modified output. Written CF, as input in the form of negative evidence on the learner's output, has a higher chance of being noticed than input in the form of positive evidence, processed and resulting in modified output. However, as has been discussed in Section 2.3.2, the salience of input and the learner's existing knowledge play an important role in a single episode of input processing. More explicit types of written CF may draw the learners' higher level of attention – *detection* (for details see Section 2.3.1.1), which may enable the following processing; while less explicit written CF types may only draw a lower level of attention, for example, *orientation* (for details see Section 2.3.1.1), and thus may not enable the following processing. Besides, more linguistic information is included in more explicit written CF types (for example, correct forms in direct correction, grammatical rules in metalinguistic explanation, or both in direct correction plus metalinguistic explanation), which may help the learners to form new hypotheses about the target-like use of the linguistic features and produce modified output. As the degree of explicitness of written CF may determine the level of attention learners pay and the amount of linguistic information learners may draw upon, more explicit written CF is more likely to result in modified output. That is, immediate improved accuracy is more likely to occur after the provision of more explicit types of written CF than less explicit written CF types (e.g. underlining and error code).

It has also been discussed in Section 2.3.2 that a learner's noticing and existing knowledge may play a less important role during knowledge consolidation. This is because the learner has built up the related explicit knowledge and what is needed at this stage is the controlled processing of explicit knowledge or the

proceduralizing of declarative knowledge. Therefore, less attention may be needed to lead the learner to find the related explicit knowledge and process it with conscious attention (controlled processing). It has been discussed in Section 2.3.2 that explicit written CF may not foster deeper processing as explicit knowledge is included in it and the learner does not have to search in their LTM; while less explicit written CF may deepen the cognitive processing because the learner has to first find the related explicit knowledge and then apply it in producing output. Therefore, more explicit written CF is expected to result in immediate improved accuracy, while less explicit written CF is expected to result in longer retention of the improved accuracy. The study did find the immediate effectiveness of explicit written CF types (metalinguistic explanation, direct correction and direct correction plus metalinguistic explanation), but not the retention of it. This may be because the learners have just developed their explicit knowledge with the assistance of more explicit types of written CF, but have not been able to consolidate the knowledge. No immediate and long-term effectiveness was found for less explicit written CF types (underlining and error code). It may be because less explicit types of written CF haven't enabled the learners to develop their explicit knowledge (knowledge modification), or haven't successfully guided the learners' attention to the related explicit knowledge and triggered controlled processing due to the low degree of explicitness.

The immediate effectiveness of more explicit types of written CF found in this study confirms the findings of both focused and unfocused written CF studies. Both of Van Beuningen et al.'s (2008, 2012) studies reported the immediate effectiveness of direct correction on ungrammatical and grammatical errors as well. The focused written CF studies all reported the immediate effectiveness of more explicit written CF, including direct correct, metalinguistic explanation (either in written or both oral and written forms) and direct correction combined with written & oral metalinguistic explanation (Bitchener, 2008; Bitchener & Knoch, 2008, 2009b, 2010a, 2010b; Ellis et al., 2008; Sheen, 2007a). Furthermore, because only the two functional uses of the English article system and past simple tense were targeted in the these studies, my findings expand what is known about the effectiveness of more explicit types of written CF to more linguistic types, including the regular and

irregular past tense and prepositions indicating space. Bitchener & Knoch (2010b) also reported the immediate effectiveness of less explicit types of written CF (circling); however, the participants in their study were advanced ESL students, but, in my study the participants were non-English major EFL learners (approximately equivalent to pre-intermediate level). For this reason, the participants in my study might not have sufficient existing knowledge to refer to when receiving underlining and error code. Another possibility is, as they had not practised their related L2 knowledge very often, both of the two implicit written CF types failed to enable the participants to successfully proceduralize it or process it in a controlled manner. This may explain why they did not benefit from underlining and error code, the less explicit types of written CF.

What is different from the existing studies is that no long-term effectiveness for more explicit types of written CF was found over four months. Most of the existing studies reported that the effectiveness was retained between two weeks to two months (e.g. Bitchener, 2008; Bitchener & Knoch, 2008, 2010b; Ellis et al., 2008; Sheen, 2007a) and in two studies (Bitchener & Knoch, 2009b, 2010a), the effectiveness was retained for over ten months. There are a number of possible reasons for the different findings. Firstly, the participants in my study were EFL students who have less contact with English than ESL learners. Thus, they may need more instruction and practice to acquire explicit/declarative knowledge, have controlled processing and finally be able to use the knowledge quickly and accurately. Secondly, the participants in this study had a lower proficiency level, which may explain why they did not benefit from less explicit types of written CF. On the other hand, the lower proficiency level may have meant that they had insufficient explicit knowledge about the targeted linguistic types to draw upon, and thus their immediate improved accuracy was not able to be retained over time.

The last, and arguably the most important reason might be that the targeted linguistic types in my study are very different from the prior studies. Although the regular past tense is quite rule-based, the rules are not as straightforward as the one of English articles. Instead, they are quite complex and may require a lot of cognitive processing to develop the explicit knowledge and consolidate it. There

are a set of rules with specific conditions when making the regular past tense forms. For example, for verbs ending with *e*, *-d* should be added to make the past tense form; while for verbs ending with *y*, there are two different rules. If there is a vowel before *y*, *-ed* is added directly; if there is a consonant before *y*, *y* needs to be changed to *i*, and then adding *-ed*). There are also different rules for the verbs ending with a vowel and then a consonant. The irregular past tense is more idiosyncratic as there is no rule to refer to. However, the irregular past tense may be less complex and require less cognitive processing than some of the regular past tense, because there is only one past tense form for an irregular verb. For example, *sat* is the past tense for *sit* and *stood* is for *stand*, while there are a number of rules to choose from when making regular past tense forms. Prepositions indicating space are very complicated and also idiosyncratic. On the one hand, there are some general rules (for example, *on* is for a two-dimensional space, and *in* for a three-dimensional space); on the other hand, the correct use of prepositions indicating space is greatly dependent on the specific linguistic context. For example, *I am in the hospital* and *I am at the hospital* convey different meanings. All three targeted linguistic types in this study are more complex than English articles and it may be harder for the learners to develop their explicit knowledge (immediate improved accuracy) or consolidate it (long-term improved accuracy). It is also possible that the long-term effectiveness of written CF on some of the regular past tense verbs has been offset by its ineffectiveness on some of the irregular past tense verbs and on prepositions indicating space, which was investigated in RQ3.

Despite no significant long-term effectiveness being found, it was not the case that no advantage was found for written CF at all. As can be observed in Figure 5.1, except the error code group, the other four treatment groups retained a much higher accuracy in delayed post-test 2 than in the pre-test. Paired-samples *t* tests were run to examine whether or not the differences between the pre-test and delayed post-test 2 were significant and it was found that all these four treatment groups (underlining, metalinguistic explanation, direct correction, and direct correction plus metalinguistic explanation) retained significantly higher accuracy than the pre-test after four months' time, $t_s > 2.55$, $p_s < .02$ (See Table 5.3); while the error code group and the control group did not.

Table 5.3

Summary of significant differences between the pre-test and the delayed post-test 2 (3 targeted types combined)

<i>Differences between the pre-test and the delayed post-test 2</i>	<i>Significance</i>
Underlining	$p = .01$
Metalinguistic explanation	$p = .01$
Direct correction	$p = .01$
Direct correction plus metalinguistic explanation	$p = .02$

To summarize the findings and discussion of RQ1, more explicit types of written CF (metalinguistic explanation, direct correction, and direct correction plus metalinguistic explanation) enabled the Chinese EFL learners to use the targeted linguistic types more accurately immediately. It may be because they drew a higher level of learners' attention and enabled the following stages of cognitive processing. It may also be because the linguistic information included in the more explicit written CF types assisted the learners to form new hypotheses, and thus resulted in modified output. However, the effectiveness of more explicit written CF was not retained over four months. Perhaps this was because one session of more explicit types of written CF did not enable the learners to consolidate the knowledge. However, the advantage of written CF was found as all the written CF types except error code enabled the learners to retain statistically higher accuracy after four months than they had in the pre-test. Thus, a larger sample size might have resulted in significant between-group differences in delayed post-tests. Having found the effectiveness of more explicit types of written CF (metalinguistic explanation, direct correction and direct correction plus metalinguistic explanation) on the accurate use of the targeted linguistic types, the next question that needs to be answered is whether or not one type of written CF is more effective than others.

5.3 Is the effectiveness of written CF dependent upon its degree of explicitness (underlining, error code, metalinguistic explanation, direct correction, direct correction plus metalinguistic explanation) (RQ2)?

As reported in Section 5.2, ANCOVAs revealed the between-group differences among the six groups in the immediate post-test, $F(5, 150) = 3.19, p = .01, \eta^2 = .10$; and post hoc pair-wise comparisons revealed the difference between three written CF groups (metalinguistic explanation, direct correction and direct correction plus metalinguistic explanation) and the control group (see Table 5.2). However, no between group difference was found among the three written CF groups in the post hoc pair-wise comparisons, $F < .07, p > .79$. As the effectiveness was not retained in the delayed post-tests, there was no need to investigate the differential effectiveness of written CF in delayed post-tests.

Theoretically, learners' attention may be drawn to errors to differing extents as a result of the explicitness of input, and the linguistic knowledge contained in the input may complement the learners' existing knowledge to differing extents; thus the more explicit the written CF is, the more improved the accuracy is likely to be. However, along with my study, the majority of the existing studies which compared direct correction with direct correction combined with metalinguistic explanation also did not find differences in effectiveness (Bitchener, 2008; Bitchener & Knoch, 2009a, 2010a). One similarity among these studies is the low level of participants' proficiency. Thus, for the low-intermediate (ESL and EFL) learners, the additional metalinguistic explanation did not result in higher improved accuracy than direct correction alone. On the contrary, Sheen (2007a) and Bitchener et al.'s (2005) studies reported that direct correction combined with metalinguistic explanation enabled the intermediate and post-intermediate ESL learners to use the targeted linguistic types (articles and past tense) more accurately than direct correction only. That might be because the participants had higher proficiency levels, so they could make better use of the metalinguistic explanation. It might also be because the targeted linguistic types were different in Bitchener et al.'s (2005) study and two sessions of treatment were provided to the participants in Sheen's (2007a) study.

Among the studies which compared the differential effectiveness of metalinguistic explanation with other written CF types, mixed results were reported. Bitchener and Knoch's (2010b) study reported that metalinguistic explanation (in written or written and oral forms) was more effective than a less explicit written CF type (underlining) on advanced ESL learners' accurate use of the two functional uses of the English article system over time. Shintani and Ellis (2013) reported the immediate effectiveness of metalinguistic explanation on low-intermediate ESL learners' accurate use of indefinite articles, but not direct correction. However, in Shintani et al.'s (2014) study, that direct correction was more effective than metalinguistic explanation was reported. The contradictory findings may result from the different variables in these two studies. The participants in Shintani et al.'s (2014) study were EFL university students in Japan (approximately at pre-intermediate level) and the targeted linguistic types were both indefinite articles and the hypothetical conditional. The EFL students may have had less knowledge of the targeted linguistic types, especially the more complex hypothetical conditional. Besides, they may have had much less opportunity of receiving English input and producing English in oral and written forms. Therefore, they may have needed direct correction to build up their explicit knowledge. Metalinguistic explanation may not have been explicit enough for them to form the correct hypotheses and develop their explicit knowledge.

These studies have initially reported the advantage of metalinguistic explanation over time, which was not found in my study. Such differences might be due to the differences in participants' proficiency level and targeted linguistic types. Both of the variables have been investigated in my study and whether or not the effectiveness of written CF differs on different targeted linguistic types will be reported in the following section.

5.4 Is written CF more effective in targeting certain linguistic errors (regular past tense, irregular past tense and prepositions indicating space) (RQ3)?

In order to address RQ3, the accuracy of each targeted linguistic type (regular past tense, irregular past tense, and prepositions indicating space) across all four testing occasions (i.e., pre-test, immediate post-test, delayed post-test 1, and delayed post-

test 2) was examined respectively. The descriptive statistics and results of the accurate use of the regular past tense will be presented first, followed by the irregular past tense and then prepositions indicating space.

5.4.1 The effectiveness of written CF on regular past tense

The accurate use of the regular past tense alone on all four testing occasions was examined and Table 5.4 displays the mean scores and standard deviations over the four testing periods for the five treatment groups and the control group. Figure 5.2 provides a visual representation of the decline or improvement in accuracy for each group across the testing sessions.

Table 5.4

Mean scores and standard deviations by group and testing period (regular past tense)

<i>Group</i>	<i>N</i>	<i>Pre-test</i>		<i>Immediate post-test</i>		<i>Delayed post-test 1</i>		<i>Delayed post-test 2</i>	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1.Underlining	25	60.33	35.91	72.67	35.25	72.65	31.59	85.40	22.08
2.Error code	24	62.91	32.37	79.95	26.33	79.87	19.76	64.64	36.60
3.Metalinguistic explanation	24	65.58	33.04	72.29	38.20	69.43	35.15	79.24	27.34
4.Direct correction	24	58.12	32.12	76.34	35.01	78.13	24.67	63.84	44.36
5.Direct correction plus metalinguistic explanation	23	59.69	38.78	84.09	24.71	81.71	31.23	77.32	33.86
6.Control	27	71.63	29.73	73.29	29.84	73.18	30.15	75.88	31.66

Figure 5.2 presents a visual illustration of the descriptive statistics. It can be seen that the accuracy of all five treatment groups was substantially higher in the immediate post-test than in the pre-test, and that it decreased or increased slightly in delayed post-test 1. In delayed post-test 2, the accuracy of the groups which received underlining and metalinguistic explanation increased sharply, resulting in much higher accuracy than in the pre-test. Meanwhile, the accuracy of the groups that received error code and direct correction decreased to a large extent, and almost regressed to the initial accuracy levels seen in the pre-test. The group which

received direct correction plus metalinguistic explanation had slightly lower accuracy in delayed post-test 2 than in delayed post-test 1, though it was still substantially higher than in the pre-test. The accurate use of the regular past tense for the control group remained quite steady across the testing periods although the accuracy in delayed post-test 2 was slightly higher than in the pre-test.

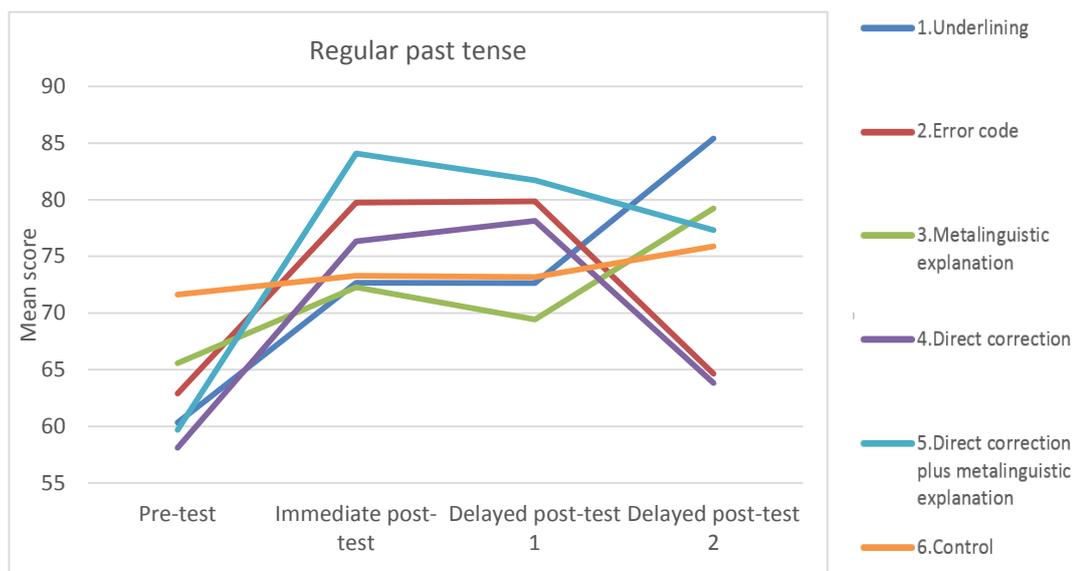


Figure 5.2. Performance over time after written CF on regular past tense

ANCOVAs were run to test the between-group differences, with the accuracy rate of the regular past tense in each post-test as the dependent variable, written CF type as the independent variable, and the accuracy rate of the regular past tense in the pre-test as the covariate.

No significant differences were found between any treatment group and the control group, or between any two treatment groups, in the immediate post-test controlling for the pre-test, $F(5, 140) = .71, p = .62, \eta^2 = .03$. No between-group differences were found in the delayed post-test 1, $F(5, 140) = .80, p = .55, \eta^2 = .03$; nor in delayed post-test 2, $F(5, 140) = 1.60, p = .17, \eta^2 = .05$.

That no effectiveness for any types of written CF on regular past tense was found is a little surprising. As has been discussed before, theoretically, at least highly

explicit written CF could be expected to be attended to, processed and finally contribute to improved accuracy. Only one of the existing written CF studies (Bitchener et al., 2005) investigated the effectiveness of written CF on the past tense separately from other linguistic types and reported not only the long-term effectiveness of more explicit types of written CF, but it also reported that direct correction plus metalinguistic explanation was more effective than direct correction alone in the immediate post-test.

Different from that study which looked at the past tense, my study examined the effectiveness of written CF on the regular past tense and irregular past tense separately due to their different nature (regular past tense is more rule-based and irregular past tense is more idiosyncratic). When looking at the regular past tense alone, the obligatory occasions of using the regular past tense were far fewer than those considering regular and irregular past tense together. I noticed when I was marking the written texts that very few regular past tense forms were used (much fewer than the irregular past tense). The details regarding the *obligatory occasions* (explanation see Section 4.3.8) of the three targeted linguistic types can be seen in Chapter 6 in the case studies. The very limited occasions of using the regular past tense might be a reason for no statistical significance being found. Another possibility might be that the regular past tense is generally taught to Chinese EFL learners in the initial stage of English study and there are general rules for forming the regular past tense. Therefore, these learners may have easily identified the regular past tense errors and corrected them by referring to the rules. It may also explain why no differences between the written CF groups and the control group were found. Written CF, even the least explicit type, may not be necessary for these rule-based simple linguistic types. In order to test the hypothesis, and also because sharp increases have been observed in Figure 5.2, paired-samples *t* tests were used to test whether or not any advantage for written CF could be found.

Paired-samples *t* tests revealed that in the immediate post-test, the written CF groups of underlining, error code and direct correction plus metalinguistic explanation had significantly higher accuracy than in the pre-test, $t_s > 2.04$, $p_s < .05$; while the improved accuracy in the direct correction group was marginally

significant, $t(23) = 1.80$, $p = .09$ (See Table 5.5). However, only the underlining group retained significantly higher accuracy in delayed post-test 2 than in the pre-test, $t(24) = 3.47$, $p < .01$.

Table 5.5

Summary of significant differences between the pre-test and the immediate post-test (regular past tense)

<i>Differences between the pre-test and the immediate post-test</i>	<i>Significance</i>
Underlining	$p < .05$
Error code	$p = .04$
Direct correction	$p = .09$ (<i>marginal</i>)
Direct correction plus metalinguistic explanation	$p < .01$

To summarize the findings and discussion of the effectiveness of written CF on the regular past tense alone, no between-group differences were found between written CF groups and the control group either immediately or over time. The reason might be the few obligatory occasions of use, or because regular past tense errors could be easily identified, corrected and avoided in subsequent written texts. However, the advantage of written CF of a low degree of explicitness, especially underlining was found both short-term and long-term. The effectiveness of underling might be found in a larger sample size or when the regular past tense is used more often in written texts.

5.4.2 The effectiveness of written CF on irregular past tense

The accuracy rates of the irregular past tense across all four testing occasions were examined and Table 5.6 displays the descriptive statistics for the mean scores and standard deviations by group and written CF type, and Figure 5.3 provides a visual representation of the patterns of decline or improvement for each group across the testing sessions.

Table 5.6

Mean scores and standard deviations by group and testing period (irregular past tense)

<i>Group</i>	<i>N</i>	<i>Pre-test</i>		<i>Immediate post-test</i>		<i>Delayed post-test 1</i>		<i>Delayed post-test 2</i>	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1.Underlining	25	56.10	25.82	64.18	20.46	61.69	25.54	69.33	20.14
2.Error code	24	58.92	22.20	72.36	17.10	71.52	19.81	73.67	19.75
3.Metalinguistic explanation	24	63.11	20.65	77.10	19.75	67.80	23.47	73.19	19.46
4.Direct correction	24	58.53	26.30	82.11	9.81	71.64	20.14	73.35	25.48
5.Direct correction plus metalinguistic explanation	23	61.81	25.55	73.76	19.66	70.60	22.45	79.58	14.35
6.Control	27	65.49	18.75	69.73	19.87	63.23	18.19	65.84	21.58

Figure 5.3 presents a visual illustration of the descriptive statistics. It can be seen that the pattern of decline or improvement of the accurate use of the irregular past tense is unlike that of the regular past tense. Although all six groups had higher accuracy in the immediate post-test, all of them had a noticeably decreased accuracy in delayed post-test 1. In delayed post-test 2, the accuracy of all the groups increased to different extents and remained higher than in the pre-test to different extents. However, the accuracy rates of all the treatment groups were substantially higher than in the pre-test, while for the control group, the accuracy in delayed post-test 2 was only slightly higher than in the pre-test.

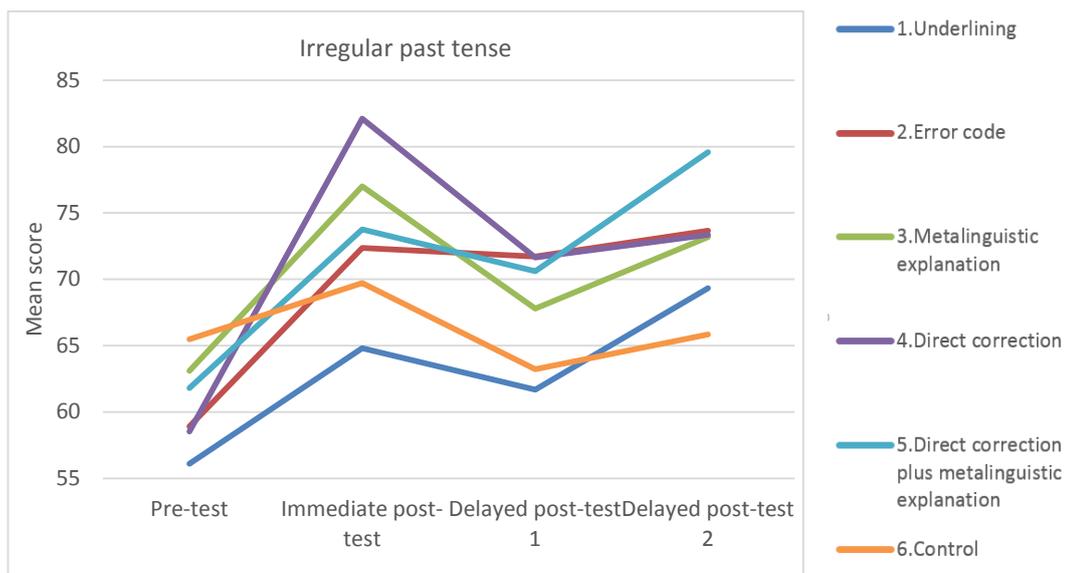


Figure 5.3. Performance over time after written CF on irregular past tense

ANCOVAs were run to test the between-group differences, with the accuracy rate of the irregular past tense in each post-test as the dependent variable, written CF type as the independent variable, and the accuracy rate of the irregular past tense in the pre-test as the covariate.

Between-group differences were found among the groups in the immediate post-test, $F(5, 140) = 3.03, p = .01, \eta^2 = .10$. Post hoc pair-wise comparisons revealed that the difference occurred only between the direct correction group and the control group, $F(1, 48) = 8.23, p < .01$. ANCOVAs were run to test the between-group differences in the two delayed post-tests, with the accuracy rate of the irregular past tense in each delayed post-test as the dependent variable, written CF type as the independent variable, and the accuracy rate of the irregular past tense in the pre-test as the covariate. There was no statistical evidence for the between-group differences in delayed post-test 1, $F(5, 140) = 1.34, p = .25, \eta^2 = .05$; nor in delayed post-test 2, $F(5, 140) = 1.73, p = .13, \eta^2 = .06$.

The findings are within expectation as for less rule-governed, idiosyncratic linguistic types like irregular past tense; the provision of the correct forms may

result in immediate improved accuracy while other types of written CF may cause confusion or be insufficient for learners to form the correct forms because no general rules can be referred to. However, the most explicit written CF type, direct correction plus metalinguistic explanation, was expected to benefit learners more because both the correct form and additional linguistic information was provided. It might be especially beneficial on more rule-based linguistic types because the metalinguistic explanation not only provides the correct form, but also provides the explanation for it (why it is the correct form or how it is formed according to the linguistic explanations). However, for more idiosyncratic linguistic types, the metalinguistic explanation might not help much. On the one hand, the metalinguistic explanation cannot be very specific as there are no rules for forming the idiosyncratic forms; on the other hand, the example in the metalinguistic explanation may be a different item from the correct form, and may confuse the learners in regard of producing the correct form. For example, *sat* was the correct form, which was provided for the learner, while in the metalinguistic explanation, *He stood up there* was given as an example of irregular past tense. In this case, the learners may be confused how to make irregular past tense form if another verb other than *sit* and *stand* is needed (for example, *quit*). The only other study (Bitchener et al., 2005) which looked at the effectiveness of written CF on the past tense reported that direct correction plus metalinguistic explanation was more effective than direct correction alone in the immediate post-test, and both of them were equally effective long-term.

Again, the different results may be because the irregular past tense was examined separately from the regular past tense in this study, but both regular and irregular past tense forms were looked at together in the previous study. The different findings may also be because of the different proficiency levels of the participants in these two studies (intermediate ESL learners in the previous study and approximately pre-intermediate EFL learners in my study). ESL learners may have had more chances for the controlled processing of the irregular past tense than EFL learners. Therefore, one session of direct correction may be sufficient for ESL learners to consolidate the knowledge, but not for EFL learners. Besides, intermediate learners may have better cognitive processing capability than pre-

intermediate learners, thus they may have successfully consolidated the knowledge of the irregular past tense; while pre-intermediate learners may not have been able to consolidate the knowledge. It might also be because different verbs were used in the two delayed post-tests and these EFL learners did not have the knowledge of the correct irregular past tense form of these items.

However, as can be observed in Figure 5.3, all of the treatment groups had much higher accuracy rates in delayed post-test 2 than in the pre-test, while the control group had only marginally higher accuracy than in the pre-test. Paired-samples *t* tests were run and the results showed that the written CF groups (underlining, error code, direct correction, direct correction plus metalinguistic explanation) retained significantly higher accuracy over four months compared to the pre-test; and the metalinguistic explanation group retained marginally significant higher accuracy in delayed post-test 2 than in the pre-test (see Table 5.7). On the other hand, the accuracy in the control group almost decreased to that of the pre-test after four months.

Table 5.7

Summary of significant differences between the pre-test and the delayed post-test 2 (irregular past tense)

<i>Differences between the pre-test and the delayed post-test 2</i>	<i>Significance</i>
Underlining	$p < .01$
Error code	$p < .01$
Metalinguistic explanation	$p = .06$ (<i>marginal</i>)
Direct correction	$p < .01$
Direct correction plus metalinguistic explanation	$p < .01$

To summarize the effectiveness of written CF on the irregular past tense, direct correction enabled the Chinese EFL learners to use the irregular past tense more accurately immediately, but not over four months. However, written CF of various degrees of explicitness enabled the learners to keep (marginally) significantly higher accuracy on the use of irregular past tense after four months than the pre-test, which to some extent indicates the facilitative role of written CF. Long-term

between-group differences might have been found if the sample size had been bigger.

5.4.3 The effectiveness of written CF on prepositions indicating space

The accurate use of prepositions indicating space throughout the testing periods for treatment groups and the control group were examined. Table 5.8 displays the descriptive statistics and Figure 5.4 provides a visual representation of the patterns of the decline or improvement of accuracy for each group across the testing sessions.

Table 5.8

Mean scores and standard deviations by group and testing period (prepositions indicating space)

<i>Group</i>	<i>N</i>	<i>Pre-test</i>		<i>Immediate post-test</i>		<i>Delayed post-test 1</i>		<i>Delayed post-test 2</i>	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1.Underlining	25	53.25	29.41	60.67	28.05	60.99	23.96	63.13	22.44
2.Error code	24	57.05	22.07	63.22	24.01	57.13	22.68	52.86	28.65
3.Metalinguistic explanation	24	46.25	23.68	63.97	33.64	59.52	21.19	62.61	26.29
4.Direct correction	24	51.65	20.71	63.00	27.55	66.76	26.63	65.49	27.30
5.Direct correction plus metalinguistic explanation	23	59.08	28.13	73.46	19.00	60.12	20.81	61.11	35.83
6.Control	27	69.29	22.11	66.42	26.29	68.69	25.76	66.17	24.32

Figure 5.4 presents a visual illustration of the descriptive statistics. The patterns observed in Figure 5.4 are very different from the ones of the regular and irregular past tense. The accuracy rates of all the treatment groups increased to different extents in the immediate post-test, whereas the rate of the control group dropped noticeably. However, the groups which received error code, metalinguistic explanation and direct correction plus metalinguistic explanation decreased in delayed post-test 1, while the control group and the groups which had received underlining and direct correction had slightly higher accuracy. In delayed post-test 2, the accuracy rates of the control group and the groups which had received error code and direct correction decreased, while the accuracy rates of the groups which

had received underlining, metalinguistic explanation and direct correction plus metalinguistic explanation increased marginally.

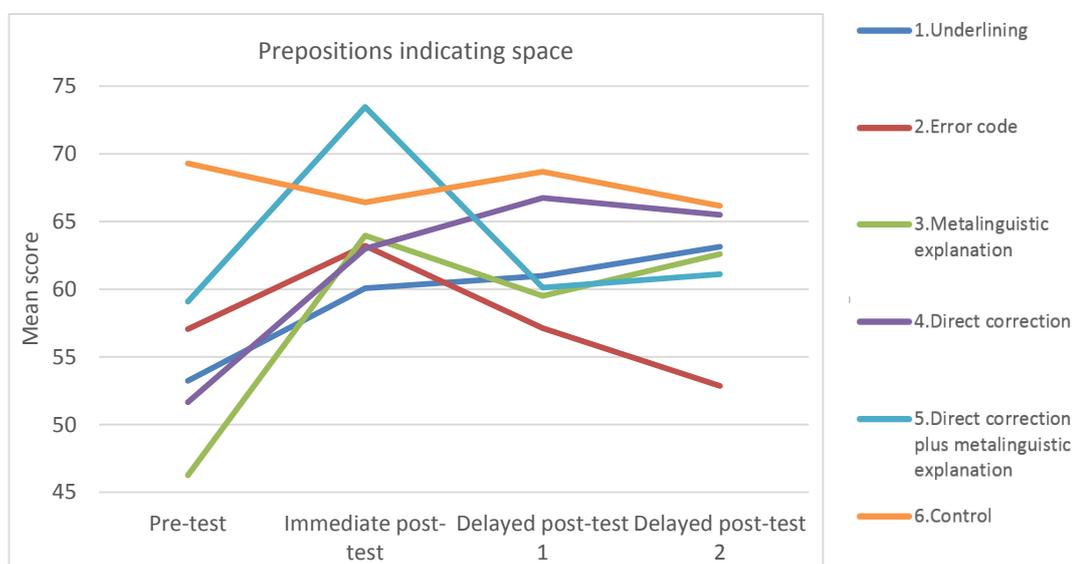


Figure 5.4. Performance over time after written CF on prepositions indicating space

In order to test whether or not the differences were statistically significant, ANCOVAs were run with the accuracy rate of prepositions indicating space in each post-test as the dependent variable and the results showed that there were no between-group differences in the immediate post-test, $F(5, 140) = .59, p = .71, \eta^2 = .02$, in the delayed post-test 1, $F(5, 140) = .76, p = .58, \eta^2 = .03$, nor in the delayed post-test 2, $F(5, 140) = .74, p = .60, \eta^2 = .03$.

That written CF was not found to be effective for prepositions indicating space was within the theoretical expectation. As has been discussed in Section 5.2, prepositions indicating space are very complicated and also idiosyncratic. On the one hand, there are some general rules (for example, *on* is for a two-dimensional space, and *in* for a three-dimensional space); on the other hand, the correct use of prepositions indicating space is dependent on the specific linguistic context. Therefore, one session of written CF treatment is very likely to be insufficient for learners to process the information and produce modified output in the subsequent writing. More importantly, as prepositions indicating space are very dependent on the linguistic context, the prepositions required in two pieces of writing may be very

different. Therefore, even if written CF has helped the learners develop their explicit knowledge on a certain instance of preposition indicating space use, the knowledge may not be applicable in another piece of writing with an even slightly different linguistic context. These may explain why no immediate improved accuracy was found even after the learners received the most explicit type of written CF.

The results of this study also confirmed Bitchener et al.'s (2005) findings that more explicit types of written CF did not enable intermediate ESL learners to use prepositions with improved accuracy. Different from their study, only prepositions indicating space were examined in my study, so the *obligatory occasions* (explanation see Section 4.3.8) for using the targeted linguistic type are much fewer. Although the participants were required to write about the locations of the people and objects in the pictures, the usage of prepositions indicating space was quite low (detailed uses see Chapter 6). Thus, that no statistical significance was found may also be due to the small number of uses of prepositions indicating space.

However, as can be observed in Figure 5.4, sharp increases occurred in some of the written CF groups. Paired-samples *t* tests were run to examine whether or not there was any advantage for written CF. The *t* tests revealed that the groups which had received metalinguistic explanation and direct correction plus metalinguistic explanation had significantly higher accuracy in the immediate post-test than in the pre-test (see Table 5.9).

Table 5.9

Summary of significant differences between the pre-test and the immediate post-test (prepositions indicating space)

<i>Differences between the pre-test and the immediate post-test</i>	<i>Significance</i>
Metalinguistic explanation	<i>p</i> = .03
Direct correction plus metalinguistic explanation	<i>p</i> = .04

However, the groups which had received metalinguistic explanation and direct correction retained significantly higher accuracy in delayed post-test 2 than in the pre-test after four months' time (see Table 5.10).

Table 5.10

Summary of significant differences between the pre-test and the delayed post-test 2 (prepositions indicating space)

<i>Differences between the pre-test and the delayed post-test 2</i>	<i>Significance</i>
Metalinguistic explanation	$p = .02$
Direct correction	$p = .04$

Therefore, although no significant effectiveness was found for written CF on the accurate use of prepositions indicating space, the advantages of metalinguistic explanation, direct correction and direct correction plus metalinguistic explanation were found. With a larger number of uses of prepositions indicating space, statistical significance might be found.

To synthesize the findings regarding the effectiveness of written CF for these three targeted linguistic types, individually, direct correction was found to enable immediate improved accuracy on the irregular past tense only. Although no significantly improved accuracy was found throughout the testing occasions for the other two linguistic types, or on other testing occasions, some trends for the effectiveness of written CF have been found. Less explicit written CF type (underlining) might be effective on more rule-based linguistic types, such as the regular past tense; more explicit type of written CF (direct correction) might be effective on less rule-governed, idiosyncratic linguistic types, such as the irregular past tense; and for very complex and idiosyncratic linguistic types, such as prepositions indicating space, highly explicit written CF (direct correction plus metalinguistic explanation) might be more effective. However, as has been discussed above, further studies with bigger sample sizes may reveal statistical significance.

It has been pointed out the findings to my RQ3 were different from Bitchener et al.'s (2005) study and one of the reasons could be the different proficiency levels

of the participants. The following section will address RQ4, whether or not proficiency level moderates the effect of written CF.

5.5 Does the proficiency level (higher and lower) of Chinese EFL learners determine how effective written CF is for improving the accuracy of (a) regular past tense, (b) irregular past tense and (c) prepositions indicating space in new writing tasks over a period of four months (RQ4)?

As learners may have mastered the targeted linguistic types to different extents due to the different complexity, proficiency level may moderate the role of written CF on the targeted linguistic types differently. Therefore, the moderating role of proficiency level was examined when the targeted linguistic types were looked at separately. The descriptive statistics for accuracy by proficiency level, treatment and testing period will be presented first, followed by the results of ANCOVAs on the effect of proficiency level on the use of written CF on each of the targeted linguistic types.

5.5.1 The effect of proficiency level on the use of written CF on regular past tense

It can be seen in Table 5.11 that participants with higher proficiency used the regular past tense with higher accuracy throughout the testing periods. Furthermore, the ANCOVA results showed that the differences between the two proficiency groups were significant in the two delayed post-tests, $F_s > 3.92$, $p_s < .05$, $\eta^2 > .03$, and marginally significant in the immediate post-test, $F(1, 134) = 2.99$, $p = .09$, $\eta^2 = .02$. However, ANCOVA results revealed no interaction between proficiency level and written CF type throughout the testing periods, $F_s < 1.20$, $p_s > .31$, $\eta^2 < .04$. Therefore, proficiency level was not found to moderate the role of written CF when the targeted linguistic type was regular past tense.

Table 5.11

Mean scores and standard deviations by group, testing period and proficiency level (regular past tense)

<i>Proficiency level</i>	<i>Group</i>	<i>N</i>	<i>Pre-test</i>		<i>Immediate post-test</i>		<i>Delayed post-test 1</i>		<i>Delayed post-test 2</i>	
			<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Lower	1.Underlining	15	53.06	9.59	59.56	10.02	72.33	8.28	84.24	5.97
	2.Error code	9	50.19	12.84	79.10	8.18	78.70	7.23	57.55	11.07
	3.Metalinguistic explanation	12	53.82	11.69	66.11	11.17	51.98	12.05	75.83	8.78
	4.Direct correction	12	54.09	9.36	76.99	8.79	75.28	8.41	61.31	13.69
	5.Direct correction plus metalinguistic explanation	7	38.93	12.23	75.71	14.45	73.33	15.33	51.43	14.50
	6.Control	9	60.74	13.25	58.80	9.53	60.39	13.18	57.96	12.49
Higher	1.Underlining	10	71.24	10.35	92.33	5.04	73.12	10.31	87.14	6.80
	2.Error code	15	70.54	6.85	80.46	7.28	80.57	4.97	68.89	10.06
	3.Metalinguistic explanation	12	77.34	5.33	78.47	11.07	86.88	3.84	82.64	7.14
	4.Direct correction	12	62.15	9.45	75.69	11.67	80.97	5.81	66.37	12.42
	5.Direct correction plus metalinguistic explanation	16	68.77	9.44	82.75	4.06	85.38	6.73	88.65	6.34
	6.Control	18	77.07	5.35	80.54	6.71	79.58	5.39	84.85	5.85

5.5.2 The effect of proficiency level on the use of written CF on irregular past tense

The descriptive statistics show that learners with higher proficiency used the irregular past tense more accurately throughout the testing occasions and the differences were revealed significant in the immediate post-test, $F(1, 134) = 20.91$,

$p < .001$, $\eta^2 = .14$, and in delayed post-test 1, $F(1, 134) = 18.72$, $p < .001$, $\eta^2 = .12$, but not in delayed post-test 2, $F(1, 134) = 2.29$, $p = .13$, $\eta^2 = .02$. However, proficiency level was not found to moderate the effect of written throughout the testing occasions, $F_s < 1.24$, $p_s > .30$, $\eta^2 < .04$.

Table 5.12

Mean scores and standard deviations by group, testing period and proficiency level (irregular past tense)

<i>Proficiency level</i>	<i>Group</i>	<i>N</i>	<i>Pre-test</i>		<i>Immediate post-test</i>		<i>Delayed post-test 1</i>		<i>Delayed post-test 2</i>	
			<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Lower	1.Underlining	15	50.33	26.29	56.68	15.63	55.39	27.18	66.70	20.25
	2.Error code	9	61.10	17.41	62.44	15.97	62.37	24.67	75.31	14.85
	3.Metalinguistic explanation	12	52.20	17.84	69.39	23.21	57.18	26.97	67.03	23.45
	4.Direct correction	12	58.25	26.21	80.29	8.77	63.48	17.64	68.57	28.51
	5.Direct correction plus metalinguistic explanation	7	58.56	14.68	56.88	26.35	56.00	32.57	73.20	21.42
	6.Control	9	50.36	19.75	61.98	18.92	52.67	9.62	56.15	18.63
Higher	1.Underlining	10	64.76	23.74	77.01	21.47	71.13	20.60	73.28	20.38
	2.Error code	15	57.61	25.14	78.30	15.28	77.01	14.52	72.68	22.63
	3.Metalinguistic explanation	12	74.02	17.72	84.63	12.25	78.42	13.35	79.35	12.61
	4.Direct correction	12	58.80	27.56	83.92	10.83	79.81	19.78	78.14	22.24
	5.Direct correction plus metalinguistic explanation	16	63.23	29.40	81.14	9.92	76.98	13.10	82.37	9.56
	6.Control	18	73.05	13.13	73.60	19.69	68.50	19.34	70.69	21.77

5.5.3 The effect of proficiency level on the use of written CF on prepositions indicating space

Students with higher proficiency were found to use prepositions indicating space with significantly higher accuracy than the lower proficiency students in the two delayed post-tests, $F_s > 7.53$, $p_s < .01$, $\eta^2 > .05$, but not in the immediate post-test, $F(1, 134) = .19$, $p = .67$, $\eta^2 = .001$.

Proficiency level had a marginal moderating effect on the effectiveness of written CF in the immediate post-test, $F(5, 134) = 2.17$, $p = .06$, $\eta^2 = .08$. However, no significant differences were found for either higher or lower proficiency participants due to the way written CF had been provided, $p > .17$. No interaction between written CF and proficiency level was found in both of the delayed post-tests, $F_s < .68$, $p_s > .64$, $\eta^2 < .03$.

Table 5.13

*Mean scores and standard deviations by group, testing period and proficiency level
(prepositions indicating space)*

<i>Proficiency level</i>	<i>Group</i>	<i>N</i>	<i>Pre-test</i>		<i>Immediate post-test</i>		<i>Delayed post-test 1</i>		<i>Delayed post-test 2</i>	
			<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Lower	1.Underlining	15	49.00	26.25	66.76	23.83	59.28	22.54	59.92	22.98
	2.Error code	9	53.90	24.17	52.67	26.55	46.38	29.86	48.15	33.01
	3.Metalinguistic explanation	12	33.33	23.84	53.92	34.24	54.60	20.83	59.72	26.79
	4.Direct correction	12	49.15	22.07	54.75	33.83	54.52	24.95	52.68	28.47
	5.Direct correction plus metalinguistic explanation	7	40.71	36.92	71.97	16.33	52.98	14.38	47.62	47.56
	6.Control	9	61.11	19.79	73.76	12.74	63.88	33.89	49.85	16.25
Higher	1.Underlining	10	59.62	34.06	50.04	32.08	63.55	26.99	67.94	21.86
	2.Error code	15	58.94	21.35	69.55	20.74	63.57	14.73	55.68	26.51
	3.Metalinguistic explanation	12	59.18	15.50	74.03	31.20	64.41	21.28	65.50	26.63
	4.Direct correction	12	54.15	19.91	71.26	17.14	79.00	23.10	78.31	19.74
	5.Direct correction plus metalinguistic explanation	16	67.12	19.74	74.11	20.53	63.24	22.77	67.02	29.26
	6.Control	18	73.37	22.59	62.75	30.62	71.09	21.36	74.33	23.85

To summarize the findings of RQ4, the proficiency level (higher and lower) of Chinese EFL learners did not have an impact on the use of written CF for improved

accuracy in new writing tasks. That is, the effect of written CF on improved accuracy did not differ due to the learners' proficiency levels.

These results are quite surprising both theoretically and empirically. It has been discussed in Gass' (1997) Computational Model that learner's existing L2 knowledge may have an impact on the extent to which input can be apperceived, comprehended, taken in, integrated and finally contribute to the development of explicit knowledge. In skill acquisition theories, the controlled processing of explicit knowledge or the proceduralization of declarative knowledge depends on how much declarative knowledge the learner has. Thus, whether or not and how much controlled processing is needed to consolidate the knowledge may depend, to a large extent, on the learner's existing L2 knowledge. Furthermore, the learner's proficiency level may, to some extent, indicate how much explicit knowledge the learner has and how much cognitive processing capability he/she can afford, thus may moderate the learner's processing of written CF. Therefore, it is very reasonable to expect a different performance due to the different proficiency levels. It has also been discussed in Section 5.4 that learners may master the knowledge to different extents due to the complexity of different linguistic types and they may have better knowledge of simple and rule-based linguistic types (i.e. English articles and regular past tense), and less knowledge of more complex and idiosyncratic linguistic types (i.e. irregular past tense and prepositions indicating space). Therefore, it is expected that written CF of different degrees of explicitness may result in the improved accuracy of various linguistic types to different extents for learners of different proficiency levels. For example, less explicit written CF may be more effective on the regular past tense for higher proficiency learners than for lower proficiency learners.

There has been no study which investigated the moderating role of proficiency level on the effect of written CF to date. However, in the review of existing empirical studies, it has been pointed out that the different proficiency levels of the participants might be one of the reasons for the contradictory results on the effectiveness of written CF (See Section 3.2.2). For example, direct correction plus metalinguistic explanation was found more effective than direct correction alone

for intermediate learners in Sheen's (2007a) study, but the differential effectiveness was not found for pre-intermediate learners in Bitchener's series of studies (Bitchener, 2008; Bitchener & Knoch, 2008, 2009a, 2010a).

There are a number of reasons which may explain why no moderating effect of proficiency level was found in this study. Firstly, as has been pointed out in Section 5.4, the limited number of uses of each of the linguistic types might be a reason that no statistical significance was found. Secondly, the difference of the higher and lower proficiency level may not be big enough to result in significant differences in performance. The participants' proficiency level was distinguished by their National Matriculation English scores (details see Chapter 4). It is a prestigious national exam in China but it mainly tests learners' knowledge about English, instead of their use of the knowledge. Besides, it is just one test and it is very likely that the score does not tell the student's real proficiency levels. It might be more reliable if a number of proficiency tests could be used to decide the participants' proficiency level. This way, participants with different proficiency levels might be found to respond differently to different types of written CF on the accurate use of various targeted linguistic types.

5.6 Conclusion

To conclude, the findings of the current study have answered the major questions in written CF research. More explicit types of written CF (metalinguistic explanation, direct correction and direct correction plus metalinguistic explanation) were found to enable Chinese EFL learners to use the targeted linguistic types more accurately only in the immediate post-test and these three written CF were equally effective. Although no significant effectiveness was found over four months, the advantage of both underlining and all three explicit written CF types was found. When looking at the effect of written CF on each of the linguistic types separately, no significant effectiveness of written CF was found on regular past tense and prepositions indicating space. Direct correction was found to enable the participants to use irregular past tense more accurately in the immediate post-test only. However, the advantage of underlining for the regular past tense, direct correction for the irregular past tense and metalinguistic explanation (plus direct correction) for

prepositions indicating space was found over four months' time. No moderating role for proficiency level on written CF was found on any targeted linguistic type at any testing occasion. However, the limitations of the study may explain the results, including the limited uses of each linguistic type and the unsound distinction of the proficiency level. On the one hand, future studies are expected to expand the sample size and recruit participants with broad differences in proficiency levels. This way, more statistical significance might be found on the differential effectiveness of written CF and the moderating effect of proficiency level. On the other hand, the following case studies may reveal more information about the effect of written CF on L2 development by investigating how each individual responded to the written CF provided on each targeted linguistic type.

CHAPTER 6

CASE STUDIES: RESULTS AND DISCUSSION

6.1 Introduction

The immediate effectiveness of written CF for a group of students has been presented in the previous chapter. However, the group's improved accuracy does not mean each of the individual learners has benefitted from written CF. As mentioned in the Methodology Chapter, two participants from each treatment group whose overall accuracy had not increased were invited to participate in a case study to find out whether or not one session of written CF treatment was ineffective for them. Because there was no large difference between the two participants, the results of only one of the cases are reported in this chapter. An analysis of both the qualitative and quantitative data collected during the case study is presented in this chapter, followed by the discussion of the findings.

To address RQ5 (*to what extent does reduced accuracy in the immediate post-test mean that one session of written CF treatment has been not beneficial for Chinese EFL learners*), two sets of data are analysed and presented. The first set of data is from the participants' written texts in the main study. Each participants' individual use of the three targeted linguistic types in the pre-test and the immediate post-test is presented with the aim of finding evidence or counterevidence for the failure of one session of written CF treatment on each error. The other set of data is from the first step of the one-on-one intervention. As mentioned in the Methodology chapter, in the first step of the intervention, each participant was asked to correct the errors in the written text of the pre-test using the written CF provided in the main study. If the participant had difficulty correcting the errors, the researcher provided another more explicit type of written CF, and this continued until the participant corrected the errors or had no difficulty understanding the correct forms provided by the researcher. The qualitative data collected from this step is then analysed and presented to determine whether or not the reason they had not been able to improve

their accuracy of the targeted linguistic forms on the immediate post-test was because the written CF they had received was not explicit enough.

To address RQ6 (*to what extent does the provision of scaffolded written CF facilitate improved accuracy for Chinese EFL learners who failed to benefit from a single written CF treatment*) three sets of data are analysed and presented. The first set of data is from the second step of the one-on-one intervention. Each participant was provided scaffolded written CF on the written text of the immediate post-test. The written CF type needed to correct each of the targeted errors was analysed and presented to track whether or not less explicit types of written CF were needed during scaffolding. After the provision of scaffolded written CF, the immediate effect test was conducted and the participants were asked to revise their written text of delayed post-test 1, which had been completed two weeks prior during the main study. Ten weeks later, the long-term effect test was conducted and the participants were asked to do a subsequent writing task. It was the same writing task used in the delayed post-test 2 in the main study. These two sets of quantitative data are analysed and presented as the evidence for the immediate and long-term effectiveness of scaffolded written CF.

6.2 To what extent does no accuracy improvement in the immediate post-test mean that one session of written CF treatment has been not beneficial for Chinese EFL learners (RQ5)?

In this section, the results of both the quantitative and qualitative analyses of each of the five cases will be presented and discussed one by one. In the end, the findings will be summarized and discussed further in regard to the effectiveness of written CF of various degrees of explicitness for each of the targeted linguistic types.

6.2.1 Case study 1: Helen from Underlining Group

6.2.1.1 Quantitative analysis

Helen was invited to participate in the case study because her overall accuracy rate decreased from 50% in the pre-test to 46.32% in the immediate post-test (see Table 6.1 below).

Table 6.1

Helen's accuracy rates of the targeted linguistic types in the pre-test and the immediate post-test

	<i>Regular past tense</i>			<i>Irregular past tense</i>			<i>Prepositions indicating space</i>			<i>Total %</i>
	Error	OC	%	Error	OC	%	Error	OC	%	
Pre-test	0	0	-	4	10	60	3	5	40	50
Immediate post-test	2	2	0	4	14	71.43	1	3	66.67	46.37

OC=obligatory occasion, %=accuracy percentage

However, when each linguistic type was looked at individually, it can be seen from Table 6.1 that her accuracy for both the irregular past tense and prepositions indicating space increased in the immediate post-test. That is, one session of underlining treatment enabled Helen to use the irregular past tense and prepositions indicating space with improved accuracy in the subsequent piece of writing. Thus, the quantitative data actually revealed the effectiveness of one session of underlining for both of these linguistic types. Although the accuracy of the regular past tense in the immediate past tense is 0%, it cannot be concluded that underlining was ineffective. Because Helen did not use any regular past tense in the pre-test at all, no written CF was provided. Thus, the data regarding her use of the regular past tense cannot be used as the evidence or counterevidence of the effectiveness of one session of underlining.

6.2.1.2 Qualitative analysis

The qualitative data came from the transcript of the first step of the one-on-one intervention. Helen was asked to correct the underlined errors in the written text of her pre-test. If she had difficulty correcting them, the researcher provided another more explicit type of written CF (details see Section 4.4.7.1). Out of the four irregular past tense errors that she had made, she corrected three on her own as a result of receiving underlining as a treatment and the other one was corrected after the researcher provided metalinguistic explanation. She corrected two out of three prepositions indicating space errors as a result of underlining, but failed to correct

the other one. The researcher provided the correct form and she had no difficulty understanding it.

6.2.1.2.1 Irregular past tense

Helen corrected the first three irregular past tense errors that were underlined, and produced fewer errors in the immediate post-test (See Table 6.2 below).

Table 6.2

Helen's use of irregular past tense in the pre-test and the immediate post-test

	<i>Errors</i>	<i>Correct uses</i>
Pre-test	They are (were), where are (were) the parents, they don't (didn't), it (was) warm	was (4) ,were, would
Immediate post-test	air is (was), everything is (was), he get (got), can (could)	was (2), were (4), got, went, couldn't, sang

(number)=time of uses

This can be explained in two possible ways. First, it is possible that underlining was explicit enough for her to realize the incorrect hypothesis, refer to her internalized L2 knowledge and form a new, correct hypothesis. That may be why she was able to improve her accuracy in the subsequent writing task. It is also possible that she may have had the knowledge of what the past tense forms are for *are* and *don't*, and when her attention was raised by underlining, she was able to retrieve her knowledge about the form and use it correctly. It should also be noted that Helen used *were* correctly once in the pre-test, and this may confirm that she had the knowledge that the past tense form for *are* is *were*. However, when her attention was focused on both meaning and form, she may not have been able to retrieve the correct form. In the immediate post-test, Helen used *were* correctly on every occasion (four times) and this may be evidence of the effectiveness of one session of underlining treatment on *are*. However, she did not use *don't* or *didn't* in the immediate post-test. Thus, the evidence or counterevidence of the effectiveness of one session of underlining treatment on *don't* was not found.

It has been mentioned above that Helen was not able to correct one of the irregular past tense errors until she received metalinguistic explanation (See Episode 1 below).

Episode 1: Irregular past tense [metalinguistic explanation]

R: Good. The last one. It warm but crowded? [underlining]

Helen: hmm

R: It is an IPT error. [error code]

Helen: hmm

R: An irregular past tense is missing between the subject 'it' and the adjective 'warm'. For example, we have to say **they were friendly**. [metalinguistic explanation]

Helen: Oh! It was.

Helen was not able to correct *It warm* as a result of underlining, and she did not use *was* correctly twice in the immediate post-test. However, she did use *was* correctly four times in the pre-test and twice in the immediate post-test. This may indicate that Helen already had the knowledge of the correct form *was*, but that she was unable to retrieve it correctly all the time. Her failure to accurately retrieve the correct form on some occasions while writing may be because her attention was more focused on meaning or other linguistic forms. Therefore, that Helen was not able to use *was* correctly in the subsequent writing task may not be because underlining was not explicit enough for her to form the correct hypothesis of the use of *was*. Instead, it may be because the controlled processing of explicit knowledge or the proceduralizing of declarative knowledge (*was* is the past tense form for *is*) triggered by one session of underlining was not sufficient for the knowledge to be consolidated. Additional sessions of underlining may enable her to consolidate the knowledge and use *was* accurately and fast (if not automatically) over time.

6.2.1.2.2 Prepositions indicating space

Helen corrected the first two prepositions indicating space errors that were underlined, and produced fewer errors in the immediate post-test (See Table 6.3 below).

Table 6.3

Helen's use of prepositions indicating space in the pre-test and the immediate post-test

	<i>Errors</i>	<i>Correct uses</i>
Pre-test	on (in) the armchair (2), below (under) the light	on the table, in their house
Immediate post-test	on (in) the recliner	in the sky, between the building

(number)=time of uses

She corrected *on the armchair* to *in the armchair* twice as a result of underlining, which may indicate underlining was explicit enough for her to form a new, correct hypothesis or retrieve the knowledge of the use of *in* when her attention was drawn to the form. However, in the immediate post-test, she used *the grandma sat on the recliner*. This can be explained in two possible ways. First, she may not be aware that *recliner* and *armchair* share the same preposition as they both provide a three-dimensional space; thus this error may not be evidence of the ineffectiveness of underlining on *on the armchair*. It is also possible that she was aware that *recliner* and *armchair* share the same preposition, but was not able to retrieve the knowledge correctly. It may be because insufficient attention was paid to the form while she was focusing on both meaning and form in writing. In this case, the conclusion might be that one session of underlining did not enable her to consolidate the explicit knowledge, and thus she was not able to use it accurately when her attention was on both meaning and form. Additional sessions of underlining may enable her to process the knowledge further so that it can be used accurately with little or no conscious attention.

Helen was not able to correct the last preposition indicating space error even with a more explicit type of written CF (metalinguistic explanation). The correct form was provided by the researcher and she had no difficulty understanding it (See Episode 2 below)

Episode 2: Prepositions indicating space [direct correction]

R: Here, below the light. [underlining]

Helen: I changed to behind.

R: But it is not correct. What is the relation between the person and the light?

Helen: Below?

R: But below means in a lower position. E.g. My apartment is below Susan's. Isn't the light like an umbrella and the person is covered by it? So which word you use for it? What the umbrella? [metalinguistic explanation]

Helen: Hmm, kind of. But I only know below.

R: Ok. You should use **Under**. [direct correction]

Helen: U-n-d-e-r?

R: Yes.

Helen: Oh, I remember the difference between below and under now.

Perhaps Helen was not able to correct *below the light* to *under the light* because she did not have the knowledge of the use of *under* in this circumstance. Furthermore, direct correction provided by the researcher may have increased her knowledge of the use of *under*. Although she had been taught how to use *under* in certain circumstances, for example, *under the table*; she may not have known that *under* can also be used in other circumstances, for example, *under the light*. Therefore, on this error, underlining was not explicit enough for Helen to produce the correct form. Instead, a more explicit type of written CF (direct correction) may have helped her build up the explicit knowledge (that *under* can be used in another circumstance). However, in the immediate post-test, *under* was not used correctly or incorrectly again. Therefore, although underlining was found to not be explicit enough for Helen to produce the correct form, evidence of the ineffectiveness of underlining on *under* was not found in the immediate post-test.

It needs to be noted that for very complex and idiosyncratic linguistic types, like prepositions indicating space, written CF is very important because during class

instruction, it is very unlikely the students can encounter all the possible circumstances in which prepositions indicating space can be used. For example, they may have learned *under the table*, but they may not know *under* should also be used for the light. When producing written texts, students may need to use prepositions indicating space in some circumstances that they haven't previously encountered, and thus they may have to make and test the hypotheses regarding the correct use of the prepositions. Written CF may inform the students that the hypotheses are incorrect and help them to build up explicit knowledge regarding the specific use of prepositions indicating space in various circumstances.

It also needs to be noted that Helen had a higher proficiency level (her score is 114, and the dividing score for higher proficiency group is 102), which may indicate that she had good L2 knowledge. This may explain why one session of underlining enabled her to use the irregular past tense and prepositions indicating space with improved accuracy and she only required the assistance of more explicit written CF on one error in each of these categories.

6.2.2 Case Study 2: Mary from Error Code Group

6.2.2.1 Quantitative analysis

Mary was invited to participate in the case study because her overall accuracy rate decreased from 91.67% in the pre-test to 80.77% in the immediate post-test (see Table 6.4 below).

Table 6.4

Mary's accuracy rates of the targeted linguistic types in the pre-test and the immediate post-test

	<i>Regular past tense</i>			<i>Irregular past tense</i>			<i>Prepositions indicating space</i>			<i>Total %</i>
	Error	OC	%	Error	OC	%	Error	OC	%	
Pre-test	0	4	100	0	13	100	1	4	75	91.67
Immediate post-test	0	4	100	1	13	92.31	2	4	50	80.77

OC=obligatory occasion, %=accuracy percentage

However, when each linguistic type was looked at individually, it can be seen that written CF was only provided on the prepositions indicating space as both the

regular past tense and irregular past tense were used correctly in the pre-test. Therefore, to examine the effectiveness of error code, only the accurate use of prepositions indicating space needs to be looked at. One more preposition indicating space error occurred after error code was provided. However, before concluding that the treatment was unsuccessful, the specific instances of prepositions indicating space used in the pre-test and the immediate post-test need to be looked at.

6.2.2.2 Qualitative analysis

The qualitative data came from the transcript of the first step of the one-on-one intervention. Mary was asked to correct the error which had been provided with error code. If she had difficulty correcting it, another more explicit type of written CF was provided by the researcher (details see Section 4.4.7.1).

Mary was not able to correct the only preposition indicating space error as a result of error code and she produced one more error in the immediate post-test (see Table 6.5 below).

Table 6.5

Mary's use of prepositions indicating space in the pre-test and the immediate post-test

	<i>Errors</i>	<i>Correct uses</i>
Pre-test	He sat_ (in) the armchair	at home, on his left, in the book
Immediate post-test	in (on) the right, in (at) his back	in the east, in the centre

In the pre-test, Mary did not use a preposition indicating space between *sat* and *the armchair* and the provision of an error code did not enable her to correct the error. She did not understand the correct form provided by the researcher and required the most explicit type of written CF (see Episode 1 below).

Episode 1: Prepositions indicating space [direct correction plus metalinguistic explanation]

R: You have got one error code in your first piece of writing. Are you aware what PS means? [**error code**]

Mary: Yes. It means prepositions indicating space.

R: So could you please correct this PS error?

Mary: Ok. Hmm... I think, hmm... I should use He sat **on** the armchair.

R: On the armchair? **On** is used for a two-dimensional space (a surface). e.g. The book is on the floor. [**metalinguistic explanation**]

Mary: Yes. On the armchair.

R: No. It should be **in** the armchair. [**direct correction**]

Mary: **in** the armchair? But why?

R: Because there are arms, a person sitting there is kind of surrounded by the armchair. In denotes the enclosure of the object in a three-dimensional space. e.g. The dish is in the box. That is why we say in the armchair, but on the bench. Clear now? [**direct correction plus metalinguistic explanation**]

Mary: Ok. I see.

It can be seen from the episode above that although error code did not enable Mary to produce the correct preposition indicating space, it did make her realize one preposition indicating space was needed between *sat* and *the armchair*. Thus, the results could not lead to the conclusion that error code was completely ineffective. Error code may have enabled her to refer to the existing knowledge in her long-term memory (LTM) and try to retrieve the relevant knowledge. Her failure to produce the correct form might have resulted from a lack of the explicit knowledge of the use of *in* for *armchair*. In the immediate post-test, the accuracy decreased; however, the two errors were very different instances (*on-in the right* and *at-in the back*), and the error *sat the armchair* did not occur again. Therefore, on the one hand, evidence that error code was effective was not found although it was not explicit enough for Mary to produce the correct form. On the other hand, it may

lead to the conclusion that less explicit type of written CF can at least prevent the further processing of incorrect knowledge and its consolidation, even if it was not explicit enough for the learner to produce the correct form.

What can be noted in Mary's case is that written CF of a higher degree of explicitness might be more helpful on prepositions indicating space because, as has been discussed in the previous chapters, this linguistic category is very complex and idiosyncratic. That means that although there are some rules regarding how to use prepositions indicating space, the specific linguistic contexts need to be considered when using them. However, it cannot be generalised that more explicit written CF is needed for prepositions indicating space than for the regular or irregular past tense. Instead, the explicitness of the written CF needed may depend more on whether or not the learner has the relevant explicit knowledge. When the learner has it, a less explicit type of written CF may be explicit enough to raise the learner's attention so that the correct forms may be retrieved (See Helen's case); while when the learner does not have the existing knowledge, a more explicit type of written CF may be needed to facilitate the learner forming a new correct hypothesis and building up the explicit knowledge.

Like Helen, Mary also has a quite high proficiency level (111). However, unlike Helen, Mary's accurate use of prepositions indicating space did not improve after error code was provided on her only error and error code was shown to be not explicit enough for Mary to produce the correct form. However, the same error did not appear again in the immediate post-test, and thus it can not be concluded that error code was unbeneficial. At least it may have prevented the processing of the incorrect knowledge. Also, it did enable Mary to realize that a preposition indicating space was needed between *sat* and *the armchair*. It may be fair to conclude that first, error code was successful in drawing Mary's attention to her existing knowledge, but when the learner lacked the relevant explicit knowledge, error code may not have been explicit enough to build up her explicit knowledge. Secondly, although error code raised Mary's attention regarding the use of one preposition indicating space, it did not enable her to use other instances of this category more accurately, which may result from a lack of attention or relevant

explicit knowledge. Thirdly, general proficiency level may not be able to indicate a learner's knowledge of a specific linguistic category or specific linguistic form. Thus, the explicitness of written CF needed and its effectiveness may depend more on whether or not the learner has the explicit knowledge of a specific linguistic form, instead of on his/her general proficiency level.

6.2.3 Case Study 3: Sue from Metalinguistic Explanation Group

6.2.3.1 Quantitative analysis

Sue was invited to participate in the case study because her overall accuracy rate decreased from 68.33% in the pre-test to 57.5% in the immediate post-test (see Table 6.6 below).

Table 6.6

Sue's accuracy rates of the targeted linguistic types in the pre-test and the immediate post-test

	<i>Regular past tense</i>			<i>Irregular past tense</i>			<i>Prepositions indicating space</i>			<i>Total %</i>
	Error	OC	%	Error	OC	%	Error	OC	%	
Pre-test	4	10	60	3	10	70	1	4	75	68.33
Immediate post-test	1	4	75	10	16	37.50	2	5	60	57.5

OC=obligatory occasion, %=accuracy percentage

However, when each linguistic type was looked at individually, it can be seen that the accuracy of the regular past tense increased from 60% to 75%; while the accuracy rates of both the irregular past tense and prepositions indicating space decreased. Therefore, the quantitative analysis may indicate that metalinguistic explanation was effective for the regular past tense, but not for the irregular past tense and prepositions indicating space.

6.2.3.2 Qualitative analysis

The qualitative data came from the transcript of the first step of the one-on-one intervention. Sue was asked to correct the errors that were provided with metalinguistic explanation. If she had difficulty correcting them, another more explicit type of written CF was provided by the researcher (details see Section 4.4.7.1).

6.2.3.2.1 Regular past tense

Sue corrected the first two regular past tense errors as a result of metalinguistic explanation and produced fewer errors in the immediate post-test (See Table 6.7 below).

Table 6.7

Sue's use of regular past tense in the pre-test and the immediate post-test

	<i>Errors</i>	<i>Correct uses</i>
Pre-test	shout (shouted), cry (cried), stay (stayed), crying (cried)	shouted, stayed, looked (3), talked
Immediate post-test	talk (talked)	needed, looked, chatted

(number)=time of uses

This can be explained in two possible ways. First, it is possible that metalinguistic explanation is explicit enough for her to form a new, correct hypothesis and that may be why she was able to improve her accuracy in the immediate post-test. It is also possible that Sue may have had the knowledge of what the past tense forms are for *shout* and *cry*, and when her attention was raised by metalinguistic explanation, she was able to retrieve her knowledge about the forms and use them correctly. It should also be noted that Sue used *shouted* correctly once in the pre-test, and this may confirm that Sue has the knowledge. Perhaps Sue did not retrieve the knowledge correctly because insufficient attention was paid on the form during writing. However, unlike Helen, Sue did not use *shouted* and *cried* correctly or incorrectly in the subsequent writing task. Therefore, although metalinguistic explanation was explicit enough for her to produce the correct forms, evidence of the effectiveness of one session of metalinguistic explanation on these two instances was not found.

Sue was not able to correct the other two regular past tense errors and required the researcher to provide the correct forms (see Episodes 1-2 below).

Episode 1: Regular past tense [direct correction]

R: Do you know how to correct here, **stay**, with the written CF you have received? [metalinguistic explanation]

Sue: No.

R: What if I change it to **stayed**? [direct correction]

Sue: Oh. Now I see. **Stayed** is the past form for **stay**, it is a regular past tense.

Episode 2: Regular past tense [direct correction]

R: **crying**? How to correct it with the written CF you have received? [metalinguistic explanation]

Sue: Hmm. How to correct it then?

R: I change it to **cried**. Understand now? [direct correction]

Sue: Oh. I have to change **y** to **i**, and then add **-ed**. That is the way. I see.

What is interesting is that Sue used *stayed* correctly and incorrectly in the pre-test, but was unable to correct the incorrect use when metalinguistic explanation was provided. Furthermore, she corrected *cry* to *cried* as a result of metalinguistic explanation, but was not able to correct *crying* to *cried*. An explanation might be that Sue was confused because both *stay* and *cry* ended with *y*. She may have become unsure whether to change *y* to *i* and then add *-ed* or directly add *-ed* to the word. Sue may have had some knowledge of how to make regular past tense forms, thus she used *stayed* correctly once and changed *cry* to *cried* as a result of metalinguistic explanation. However, when producing the past tense forms for both *cry* and *stay*, she may have got confused. She may have remembered that for some words *y* needs to be changed to *i*, while for others *-ed* needs to be directly added, but she may not have been clear regarding the exact rules. This indicates that for the regular past tense, metalinguistic explanation may be sufficient for some instances which refer to straightforward rules (e.g., *-ed* is directly added), but not for others which refer to more complex rules (e.g., verbs ending with *y*). Because *stayed* and *cried* were not used correctly or incorrectly in the immediate post-test, the evidence or counterevidence for the effectiveness of one session of

metalinguistic explanation on them was not found although Sue did improve her accuracy in using the regular past tense in the immediate post-test.

6.2.3.2.2 Irregular past tense

Sue was not able to correct any of the irregular past tense errors that were provided with metalinguistic explanation (two of them are the same item) (See Table 6.8).

Table 6.8

Sue's use of irregular past tense in the pre-test and the immediate post-test

	<i>Errors</i>	<i>Correct uses</i>
Pre-test	wake (woke)(2), drink (drank)	did, didn't, had (2), was (2), could,
Immediate post-test	are (were), Ann's son were (was), is (was)(6), trees was (were), wear (wore)	had(2), came, was, fed, were

(number)=time of uses

Sue was not able to correct the irregular past tense errors when metalinguistic explanation was provided; however, when the researcher provided the correct forms, Sue had no difficulty understanding them (see Episodes 3-4 below).

Episode 3: Irregular past tense [direct correction]

R: You used **wake** twice here and both of them are incorrect. Can you correct them with the metalinguistic explanation you have received? [**metalinguistic explanation**]

Sue: It should be irregular past tense. But I do not remember the form.

R: It should be **woke**. Do you understand now? [**direct correction**]

Sue: Yes. I know now. I just have to remember it.

Episode 4: Irregular past tense [direct correction]

R: Yes. So what about this one? Can you correct it with the metalinguistic explanation you have received? [**metalinguistic explanation**]

G5-S1: D...A.. I can not remember.

R: It is drank. [**direct correction**]

G-S1: Ur.. D..R..ank. Ok, I remember now.

Sue was not able to correct the irregular past tense errors when metalinguistic explanation was provided, and required the researcher to provide direct correction for *wake* and *drink*. It may clearly indicate that she did not have existing knowledge of the past tense forms for *wake* and *drink* and metalinguistic explanation was not explicit enough for her to form a new, correct hypothesis because there were no rules to refer to when producing the irregular past tense forms.

However, her decreased accuracy in the use of the irregular past tense may not be because metalinguistic explanation was not explicit enough for Sue to produce the correct forms for *wake* and *drink*. The errors that occurred in the immediate post-test were different instances as *wake* and *drink* were not used. Therefore, although metalinguistic explanation was found not explicit enough for Sue to produce the correct forms, no evidence of its ineffectiveness was found.

6.2.3.2.3 Prepositions indicating space

Sue successfully corrected the only preposition indicating space error as a result of metalinguistic explanation, but produced more errors in the immediate post-test (See Table 6.9 below).

Table 6.9

Sue's use of prepositions indicating space in the pre-test and the immediate post-test

	<i>Errors</i>	<i>Correct uses</i>
Pre-test	stay_ (at) home	in hands, on the face, on the opposite
Immediate post-test	in () here, in (on) land,	in the road (3)

(number)=time of uses

Sue corrected her only preposition indicating space error as a result of metalinguistic explanation in the pre-test, which may indicate that metalinguistic explanation was explicit enough for her to either form a new, correct hypothesis or retrieve the explicit knowledge. However, she did not use the same instance correctly or incorrectly again in the immediate post-test. Therefore, although metalinguistic explanation was found explicit enough for Sue to use *at* correctly, no evidence or counterevidence for its effectiveness was found in the immediate post-test. Besides, Sue's accurate use of prepositions indicating space decreased in

the immediate post-test, and it may indicate that metalinguistic explanation was unbeneficial for other instances of prepositions indicating space. It may be because prepositions indicating space are very idiosyncratic and the explicit knowledge of one individual use may not benefit another individual use.

To sum up the effectiveness of metalinguistic explanation on Sue's accurate use of the three linguistic types, when Sue had the explicit knowledge, regardless of whether or not it belonged to more rule-based categories such as the regular past tense or more complex and idiosyncratic categories such as prepositions indicating space, metalinguistic explanation was explicit enough to raise her attention and to allow her to retrieve the knowledge. However, when she did not have the explicit knowledge, more explicit written CF (with direct correction included) was needed because it may have helped her to build up her existing knowledge. However, for the question as to whether or not one session of metalinguistic explanation enabled Sue to use the linguistic types more accurately, except the quantitative evidence on the regular past tense, no evidence or counterevidence was found in the qualitative analysis. Unlike Helen and Mary, Sue's proficiency level is much lower than the dividing score (102) for the lower proficiency group (84). This may explain why metalinguistic explanation on some of the errors was not explicit enough for her to produce the correct forms and why she committed more irregular past tense and prepositions indicating space errors in the subsequent writing task.

6.2.4 Case Study 4: Shirley from Direct Correction Group

6.2.4.1 Quantitative analysis

Shirley was invited to participate in the case study because her overall accuracy rate decreased from 67.36% in the pre-test to 66.35% in the immediate post-test (see Table 6.10 below).

Table 6.10

Shirley's accuracy rates of the targeted linguistic types in the pre-test and the immediate post-test

	<i>Regular past tense</i>			<i>Irregular past tense</i>			<i>Prepositions indicating space</i>			<i>Total %</i>
	Error	OC	%	Error	OC	%	Error	OC	%	
Pre-test	2	6	66.67	5	16	68.75	1	3	66.67	67.36
Immediate post-test	1	5	80	2	14	85.71	6	9	33.33	66.35

OC=obligatory occasion, %=accuracy percentage

However, when each linguistic form is looked at individually, it can be seen that her accurate use of both the regular and irregular past tense actually increased greatly. However, her accurate use of prepositions indicating space decreased sharply. This may indicate that one session of direct correction treatment was quite effective on the regular and irregular past tense, but not on prepositions indicating space.

6.2.4.2 Qualitative analysis

The qualitative data came from the transcript of the first step of the one-on-one intervention. Shirley was asked whether or not she had difficulty understanding the correct forms provided by the researcher. She understood the correct forms completely and did not require any further assistance.

6.2.4.2.1 Regular past tense

Shirley did not have difficulty understanding that *liked* is the past tense form for *like* and she used *liked* correctly in the subsequent writing task, which may be evidence of for the effectiveness of direct correction (See Table 6.11 below).

Table 6.11

Shirley's use of regular past tense in the pre-test and the immediate post-test

	<i>Errors</i>	<i>Correct uses</i>
Pre-test	like (liked)(2)	asked, stared, wanted, waved
Immediate post-test	stoped (stopped),	looked (2), waved, liked

(number)=time of uses

Besides, she used all the instances which share the same rule (when a verb ends in an *e*, *-d* is added to the end) with *like* correctly in the immediate post-test. Only one

regular past tense error occurred in the immediate post-test. She directly added *-ed* to *stop*. The occurrence of this error may not be counterevidence for the effectiveness of direct correction because *stop* does not share the same rule with *like* when forming the past tense. *Stop* is a word which ends in a consonant, vowel and consonant, so *p* needs to be doubled before adding *-ed* to the end (*stopped*). Therefore, direct correction may have been explicit enough to raise Shirley's attention to either build up her explicit knowledge of forming the past tense for the words such as *like*, but it may not be able to benefit other instances which do not share the same rule, such as *stop*. Therefore, for rule-based regular past tense, the effectiveness of direct correction was proven in Shirley's case but the effectiveness may be limited as the correct form may only reflect a specific rule, not all the rules regarding forming the regular past tense.

6.2.4.2.2 Irregular past tense

Shirley also had no problem in understanding the correct forms of the irregular past tense and used them with improved accuracy in the immediate post-test (See Table 6.12 below).

Table 6.12

Shirley's use of irregular past tense in the pre-test and the immediate post-test

	<i>Errors</i>	<i>Correct uses</i>
Pre-test	has (had), are (were), writed (wrote), sited (sat), waked (woke),	was (5), read, ate, got, made, were, let
Immediate post-test	standed (stood), rid (rode)	told, had (3), were (2), would, sat, ate, fed, was (2)

(number)=time of uses

In the immediate post-test, Shirley correctly used three (*had, were, sat*) out of the instances which had received direct correction. This may be evidence for the effectiveness of direct correction. In the pre-test, Shirley added *-ed* to *sit* to form the past tense, which may indicate she had not had the explicit knowledge of the irregular past tense form of *sit*. She used *has* in the pre-test and received direct correction, but in the immediate post-test she used *had* correctly three times. It may mean that Shirley had had the explicit knowledge. Direct correction may have

enabled her controlled processing of explicit knowledge or proceduralizing declarative knowledge, so that she could use this instance correctly in the subsequent writing task. *Were* was used correctly and incorrectly in the pre-test, which may indicate Shirley had the explicit knowledge but may not have been able to retrieve the knowledge correctly all the time. Direct correction may have enabled her to process the knowledge with conscious attention again, so that she was able to use it correctly in the subsequent writing task. However, the other two incorrectly used instances (*write* and *wake*) were not used again in the immediate post-test, and the two incorrectly used instances (*stand* and *ride*) in the immediate post-test had not previously received direct correction treatment, thus may not be the counterevidence of the effectiveness of direct correction.

6.2.4.2.3 Prepositions indicating space

Shirley committed one error in the pre-test, but six errors occurred in the immediate post-test (See Table 6.13 below).

Table 6.13

Shirley's use of prepositions indicating space in the pre-test and the immediate post-test

	<i>Errors</i>	<i>Correct uses</i>
Pre-test	at (in) the corner of the room	in their house, in front of
Immediate post-test	sat (in) the recliner, at (on) her leg, in (on) the ground, at (on) the grass, on () the green field, at (in) the distance	in a park, at the back, in the centre

Shirley only had one error out of three uses of prepositions indicating space in the pre-test and she had no difficulty understanding the correct forms. However, she made six errors out of nine uses of prepositions indicating space in the immediate post-test. The one error which received direct correction was to use *in* instead of *at* before *the corner of the room*. The same instance was not used in the immediate post-test, thus the increased number of errors may not be evidence of the ineffectiveness of direct correction. However, it has to be admitted that the effectiveness of direct correction might be limited to the specific individual use only. It may be because on the one hand, prepositions indicating space are idiosyncratic;

On the other hand, they are very complex as their correct use depends very much on the linguistic circumstances, and a slight change may result in a different preposition indicating space being needed.

Shirley’s case revealed that direct correction may have been explicit enough for her to understand the correct forms of all three linguistic types. In spite of the quantitative data, evidence was found that direct correction enabled Shirley to use the corrected instances correctly in the subsequent writing task. However, the direct correction of the errors did not seem to result in the accurate use of other instances which did not share the same rules. Thus, direct correction may have a better effect on the rule-based regular past tense than on the less rule-governed, idiosyncratic irregular past tense and highly complex prepositions indicating space. It needs to be noted that Shirley has lower proficiency (101), which may mean that her limited existing knowledge prevented other instances from benefitting from one session of direct correction treatment.

6.2.5 Case Study 5: Anna from Direct Correction plus Metalinguistic Explanation Group

6.2.5.1 Quantitative analysis

Anna was invited to participate in the case study because her overall accuracy rate decreased from 40% in the pre-test to 31.11% in the immediate post-test (see Table 6.14 below).

Table 6.14

Anna’s accuracy rates of the targeted linguistic types in the pre-test and the immediate post-test

	<i>Regular past tense</i>			<i>Irregular past tense</i>			<i>Prepositions indicating space</i>			<i>Total %</i>
	Error	OC	%	Error	OC	%	Error	OC	%	
Pre-test	0	0	-	4	5	20	2	5	60	40
Immediate post-test	1	1	0	4	10	60	2	3	33.33	31.11

OC=obligatory occasion, %=accuracy percentage

However, when each linguistic form is looked at individually, the accuracy of the irregular past tense increased sharply, but the accuracy of prepositions indicating space decreased. No written CF was actually provided on the regular past tense as it was not used at all in the pre-test. Therefore, the quantitative data may indicate the effectiveness of direct correction plus metalinguistic explanation on the irregular past tense, but not on prepositions indicating space for Anna.

6.2.5.2 Qualitative analysis

The qualitative data came from the transcript of the first step of the one-on-one intervention. Anna was asked whether or not she had difficulty understanding the correct forms plus metalinguistic explanation provided by the researcher. She required no further explanation and stated that she understood it well, which may mean that direct correction plus metalinguistic explanation was explicit enough for her to understand the correct forms.

6.2.5.2.1 Irregular past tense

Anna used *was* incorrectly three times in the pre-test. After she received one session of direct correction plus metalinguistic explanation, she used *was* correctly four times and incorrectly once in the immediate post-test (See Table 6.15 below).

Table 6.15

Anna's use of irregular past tense in the pre-test and the immediate post-test

	<i>Errors</i>	<i>Correct uses</i>
Pre-test	is (was)(3), gives (gave)	were
Immediate post-test	sit (sat), are (were), is (was), to spent (spend)	was (4), were (2)

(number)=time of uses

This can be explained in two possible ways. First, it is possible that Anna may have had the existing knowledge, and direct correction plus metalinguistic explanation may have raised her attention and allowed her to retrieve the knowledge and process it in a controlled manner. Therefore, Anna was able to retrieve the knowledge accurately three times in the subsequent writing task. It is also possible that Anna may have not had the explicit knowledge that *was* is the past tense form for *is*. The direct correction plus metalinguistic explanation may have helped her to build up that knowledge, and thus she was able to use it in the subsequent writing task. In

either case, the most explicit written CF enabled Anna to use *was* with improved accuracy in the immediate post-test. Anna used *were* correctly in the pre-test, but she used *were* correctly twice and incorrectly once in the immediate post-test, which may indicate that the effectiveness of direct correction plus metalinguistic explanation on the irregular past tense was quite limited. This type of written CF may not be able to benefit other irregular past tense instances. It is understandable that the irregular past tense is idiosyncratic and has no rules to refer to, and thus direct correction plus metalinguistic explanation on one error may not be able to be transferred to other instances of irregular past tense.

6.2.5.2.2 Prepositions indicating space

Anna made two errors out of five uses of prepositions indicating space in the pre-test; while she made two errors out of three uses of prepositions indicating space in the immediate post-test (See Table 6.16 below).

Table 6.16

Anna's use of prepositions indicating space in the pre-test and the immediate post-test

	<i>Errors</i>	<i>Correct uses</i>
Pre-test	drank on (at) the tea table, read on (at) the desk	in front of, books on the desk, in the books
Immediate post-test	in (on) the bench, from (in) the picture	in the park

Anna incorrectly used *on* twice, and both were used in the same circumstances (indicating some action happens at some place). She had no difficulty understanding the direct correction plus metalinguistic explanation, but the same circumstances did not appear again in the immediate post-test. Thus evidence of the effectiveness of written CF on this instance was not found. She did use prepositions indicating space with a decreased accuracy rate in the immediate post-test; however, the two errors (*in the bench* and *from the picture*) were very different from the ones in the pre-test (*on the table/desk*) which had received direct correction plus metalinguistic explanation. Thus, the occurrence of the errors in the immediate post-test may not be evidence of the ineffectiveness of direct correction plus

metalinguistic explanation. The most explicit type of written CF, direct correction plus metalinguistic explanation may have benefitted the specific instance (enabled Anna either to build up explicit knowledge or to process the knowledge with a lot of conscious attention). However, it may not be able to benefit the use of prepositions indicating space in a slightly different circumstances in the subsequent writing task (discussions see Shirley's case).

Anna is from the higher proficiency group (106), and this may explain why she was able to use the corrected instances correctly in the subsequent writing. However, it needs to be noted that English proficiency level is just a general indicator of a learner's knowledge of and ability to use English and it may not indicate the learner's explicit knowledge of a specific linguist type or instance. Thus, the written CF type needed and its effectiveness may depend more on whether or not a learner has the relevant explicit knowledge, instead of his/her general proficiency level.

6.2.6 Summary and discussion of the findings of RQ5

RQ5 investigated the extent to which no accuracy improvement in the immediate post-test means one session of written CF treatment was not beneficial. On the one hand, whether or not each participant required more explicit types of written CF was looked at as evidence that one session of written CF treatment was not explicit enough to benefit the participant. On the other hand, each individual use of the targeted linguistic types in both the pre-test and the immediate post-test was looked at. The reoccurrence of the errors which had received written CF in the immediate post-test was regarded as evidence of the ineffectiveness of one session of written CF treatment.

6.2.6.1 One session of written CF treatment for regular past tense

When the regular past tense was looked at individually in the five case studies, no evidence was found that written CF of any degree of explicitness was not beneficial. When the written texts of the immediate post-test were analysed closely, it was found that the accuracy of the regular past tense either increased or decreased; that latter does not indicate that one session of written CF (of any kind) was necessarily ineffective. The participants had not used regular past tense in the pre-test, and thus no written CF was provided. Therefore, the decreased accuracy can not be used as

the evidence for the ineffectiveness of written CF. For example, Helen and Anna did not use the regular past tense at all in the pre-test, thus no written CF was provided. Therefore, the zero accuracy rates in the use of the regular past tense in the immediate post-test could not prove that underlining and direct correction plus metalinguistic explanation was not beneficial for Helen and Anna. Furthermore, Mary used all the regular past tense forms correctly in both the pre-test and the immediate post-test, thus no written CF was provided.

However, in Sue's case, metalinguistic explanation was not explicit enough for her to produce the correct forms of two (*crying* and *stay*) out of four regular past tense errors that she had made, and direct correction was required. What is interesting is that she still used the regular past tense with improved accuracy in the immediate post-test. However, the correctly used regular past tense instances (*needed*, *looked*, *chatted*) refer to different rules than in incorrectly used forms *crying* and *stay*. Therefore, although metalinguistic explanation was not explicit enough for Sue to produce the correct forms (*cried* and *stayed*), it may have raised Sue's attention on the forms of the regular past tense. She may have had the explicit knowledge to produce the regular past tense in other instances which refer to different rules (for the three different rules of producing regular past tense forms see Section 6.2.3). Thus, only attention needs to be raised, so that the learners may be able to use these regular past tense forms more accurately. For this reason, written CF of a low degree of explicitness might be explicit enough to raise the learner's attention regarding the accurate use of the regular past tense in the subsequent writing immediately after receiving written CF. However, for some regular past tense forms, more detailed rules apply, for example, in Sue's case with *stay* and *cry*. Both of these end with *y*, but for *stay*, *-ed* needs to be added; while for *cry*, *y* needs to be changed to *i* and then *-ed* added, which may explain why Sue was not able to arrive at the correct forms with a general metalinguistic explanation and required a more explicit type of written CF (direct correction). Although Sue was not able to produce the correct regular past tense forms for *stay* and *cry*, she used the regular past tense with improved accuracy in the immediate post-test. It may have been due to the benefits of metalinguistic explanation, which raised her attention to form the regular past tense by adding *-ed* to the end of the verbs. Furthermore, the only regular past tense

error in the immediate post-test was *talk*, which was used correctly in the pre-test as *talked* with other correct instances that used the same rule (*chatted, needed, looked*), thus it may have been a careless mistake.

Shirley used the regular past tense with improved accuracy after one session of direct correction treatment. She did not add *-d* to *like* twice, but she used *asked, stared, wanted and waved* correctly, thus it may have been a careless mistake. In the immediate post-test, she used *stoped* instead of *stopped*. This error may not bear relation to the direct correction which was provided on *like* because a different rule applies on *stop*.

Both Sue and Shirley were able to use the regular past tense with improved accuracy after receiving one session of metalinguistic explanation and direct correction. They remembered to add *-ed* to the verbs to form the regular past tense. However, it should be noted that both of them showed difficulty in applying more detailed rules when forming the regular past tense. Sue was not able to produce the correct regular past tense form of *cry* and *stay*; while Shirley made a new error in the immediate post-test when she directly added *-ed* to *stop*. These errors may indicate that less explicit written CF (at least metalinguistic explanation) may enable the learners to remember the basic rules (to add *-ed* to form the regular past tense); however, for the special verbs, including the ones ending with *y*, and with a consonant, a vowel and then a consonant, more explicit written CF (direct correction and direct correction plus metalinguistic explanation) might be needed for them to form the correct forms and use them correctly in the subsequent writing task. However, one thing that needs to be noted is that both Sue (87) and Shirley (101) have a lower proficiency level (score <102). Thus, the lower proficiency level may explain why they did not have the explicit knowledge to use the correct regular past tense of the verbs which end with *y* or a consonant, a vowel and then a consonant. Students who have a higher proficiency level may have the explicit knowledge, and thus less explicit written CF may enable them to retrieve the knowledge and produce the correct regular past tense forms in the subsequent writing task.

A previous study has reported the effectiveness of written CF on the regular past tense (Bitchener et al., 2005) and the regular past tense has been regarded as a

simple rule-based linguistic form (Ferris & Roberts, 2001). However, the case studies have revealed that among the regular past tense, there are some different sub-categories which may vary in complexity. For the verbs which refer to the “direct *-ed* adding rules”, less explicit written CF may be explicit enough to raise the learners’ attention, so that they could remember to add *-ed* in subsequent writing tasks; while for the verbs to which more detailed rules apply, more explicit types of written CF might be needed. This may also explain why no written CF group was found to have significantly higher accuracy than the control group in the main study. The majority of the verbs used throughout the testing occasions refer to the “direct *-ed* adding rules” when forming the regular past tense. And the students at the university level may all have acquired the rules. Therefore, the students in the control group may have easily identified the errors and processed the rules. Thus they were able to use these regular past tense instances correctly in the immediate post-test.

6.2.6.2 One session of written CF treatment for irregular past tense

When looking at the use of the irregular past tense alone, quantitative data showed that four out of the five participants used the irregular past tense more accurately after receiving one session of written CF treatment. Only Sue used the irregular past tense with decreased accuracy in the immediate post-test. She had two irregular past tense errors (*wake* and *drink*) in the pre-test and she was not able to correct either of them after receiving metalinguistic explanation. She required the researcher to provide direct correction. That the metalinguistic explanation was not explicit enough for her to arrive at the correct forms may explain the decreased accuracy rate in the immediate post-test. However, *wake* and *drink* were not included in the ten irregular past tense errors in her immediate post-test. Thus, the decreased accuracy in the immediate post-test could not prove the failure of one session of metalinguistic explanation on these two instances.

Helen successfully corrected three out of four irregular past tense errors as the result of underlining and it may explain why she had improved accuracy in the immediate post-test. Both Shirley and Anna did not require any further written CF help and they both used the irregular past tense with improved accuracy. Therefore, for less

rule-governed, idiosyncratic linguistic types like the irregular past tense, providing the correct forms of the errors may be more important as there are no rules for the learners to refer to to arrive at the correct forms. Thus, more explicit types of written CF, including direct correction and direct correction plus metalinguistic explanation, may better enable improved accuracy than less explicit types of written CF (underlining, error code and metalinguistic explanation) as they may not be explicit enough for the learners to arrive at the correct forms.

One thing has to be noted. Both Sue and Shirley belong to the lower proficiency group. However, Sue's score is only 87, which is far below 102, which is the dividing line for higher or lower proficiency level. Sue may not have had much explicit knowledge of the irregular past tense, which may explain why metalinguistic explanation failed to enable her to produce the correct forms. Shirley also has a lower proficiency level (101), but her score is quite near to 102. She received direct correction, which may have enabled her to use the irregular past tense more accurately in the immediate post-test. Furthermore, Helen has received the least explicit type of written CF treatment, underlining; her higher proficiency level (114) may mean that she had better explicit knowledge, which may have enabled her to retrieve the knowledge and produce the correct forms when her attention was raised.

6.2.6.3 One session of written CF treatment for prepositions indicating space

Prepositions indicating space are the most complex one among these three targeted linguistic types. The complexity lies in that although some general rules to refer to, its correct use depends very much on specific linguistic context. A correct preposition indicating space use may be incorrect in a slightly different context. For example, *Meet me **at** the office, but she is **in** her office.* Therefore, it is very unlikely that written CF on one preposition indicating space can benefit the correct use of it in subsequent writing tasks. The effect of written CF on prepositions indicating space seems not promising as no improved accuracy was found after one session of written CF treatment for four out of five participants. However, the in-depth analysis of the individual use of the prepositions in the written texts of the pre-test

and the immediate post-test did not show any evidence that the errors occurred again after receiving one session of written CF of any kind.

Helen (114) is the only participant whose accuracy regarding prepositions indicating space increased in the immediate post-test. It needs to be noted that the written CF type Helen received was the least explicit one, underlining. Underlining was explicit enough for her to produce the correct forms for two out of the three errors, and it may explain why Helen improved her accuracy in the immediate post-test. However, error code was not explicit enough for Mary (111) to correct her only error, and it may also explain why she was not able to improve her accuracy. Metalinguistic explanation was explicit enough for Sue (87) to correct her only error, however, she was not able to improve her accuracy in the immediate post-test. Shirley (101) and Anna (106) both received the correct forms of the errors, however, it did not enable them to use prepositions indicating space with improved accuracy.

It can be noted although prepositions indicating space is the most complex among the three targeted linguistic types, it does not mean that the most explicit type of written CF was needed. Instead, less explicit types of written CF were explicit enough for the participants to produce the correct forms. However, this may not lead to the improved accuracy in the immediate post-test because the linguistic contexts were different from the ones in the pre-test. It can also be noted that proficiency level may not be an accurate indicator of the extent to which the participant needs written CF assistance. Sue has lower proficiency but she produced the correct form as a result of metalinguistic explanation; while Mary has higher proficiency level but was not able to correct the error as a result of metalinguistic explanation.

6.2.6.4 Final remarks

To sum up the findings of RQ5, although the participants' overall accuracy decreased after receiving written CF, no evidence was found that one session of written CF treatment of any kind was completely unbeneficial on any of the targeted linguistic types. However, it was found that written CF of a higher degree of explicitness (direct correction and direct correction plus metalinguistic explanation)

was more likely to be explicit enough for the learners to arrive at the correct forms. Based on the five cases, no obvious pattern has been found regarding the explicitness of written CF needed on a certain linguistic type, as prepositions indicating space errors were found to need more explicit written CF than some of the regular and irregular past tense errors; while some regular and irregular past tense errors also required highly explicit written CF in some instances.

To date, no study has investigated whether or not written CF was explicit enough for individual learners to produce the correct forms of each targeted linguistic error. However, three written CF studies have investigated written CF on an individual basis, but within a socio-cultural framework (see Chapter 3 for details). Despite the differences in the focus and design of the studies, one of them reported some similar findings. Aljaafreh and Lantolf's (1994) study recruited three students and looked at how written CF within their Zone of Proximal Development (*ZPD*, the domain where learning can most productively take place) helped the *appropriation* (taking over) of English articles, tense making, prepositions and modal verbs. Although the researchers did not intend to explore the correlation between the explicitness of written CF needed and the targeted linguistic types, it was reported that learners had required different levels of written CF help (written CF of different degrees of explicitness). The current study confirmed their findings and further uncovered that even for the same linguistic type, the explicit knowledge a learner has may vary in each specific instance, and therefore different degrees of written CF assistance may be needed. Aljaafreh and Lantolf (1994) also pointed out that learners of the same proficiency level could not be arbitrarily assumed to be at the same stage in their interlanguage growth, especially on a specific linguistic instance. This is concordant with the findings of RQ5 and may also explain why proficiency level was not found to moderate the effect of written CF in RQ4.

Since no pattern was found regarding the effectiveness of written CF when focusing on the degree of explicitness of written CF input, it may be worth looking at the effect of written CF within an Interactionist framework. The following section will present and discuss the results of RQ6, which investigated whether or not providing scaffolded written CF on each error through negotiation between the researcher and

individual learner could result in improved accuracy in the subsequent writing tasks in the short-term and the long-term.

6.3 To what extent does the provision of scaffolded written CF facilitate improved accuracy for Chinese EFL learners who failed to benefit from a single written CF treatment (RQ6)?

As has been explained in the Methodology chapter, in the second step of the one-on-one intervention, each individual was scaffolded to correct their errors in the written text of the immediate post-test which had been completed six weeks prior in the main study. After the provision of scaffolded written CF, the immediate effect test was conducted and ten weeks later, the long-term effect test was conducted. In this section, the results of both the qualitative and quantitative analyses of the five cases will be presented and discussed case by case. The qualitative data analysis which reveals the specific written CF type needed on each of the errors during scaffolding will be presented and discussed first. Then the quantitative data analysis which reveals the extent to which scaffolded written CF could result in improved accuracy immediately and over ten weeks will be presented and discussed. At the end of this section, the findings of these five cases will be summarized and the overall findings will be discussed further.

6.3.1 Case study 1: Helen from Underlining Group

6.3.1.1 Scaffolded written CF for Helen

In the second step of the one-on-one intervention, Helen was asked to identify and correct the errors in the written text of the immediate post-test with the provision of scaffolded written CF via The Graduated Written CF Strategies (See Section 4.4.6). The episodes of scaffolded written CF are presented below, and the number in the square brackets refers to the written CF strategies needed. For example, [2] means that the researcher underlined the error.

Episodes of scaffolded written CF for Helen:

R: You have already successfully corrected the errors in the first piece of writing. However, you made more errors in the second piece of writing. Let's have a look.

Helen: (laughing) Oh.

R: Would you please correct them yourself? Have a try. What is wrong with this sentence?

Helen: I should not use **is**.

R: Ok.

Helen: I shouldn't use **are** either.

R: Ok.

Helen: Oh, **was**. I should use **was** in both of the places. **IPT [0]**

R: Great. Get there early?

Helen: **got!** **IPT[0]**

R: the horse exit?

Helen: **exited** **RPT[0]**

R: on the chair?

Helen: **in.** **PS[0]**

R: and chated about their topics? **IPT[0]**

Helen: Hmm

R: chated about? **[1]**

Helen: Isn't it correct?

R: should it be chated? **[2]**

Helen: hmm

R: It is an RPT error. **RPT[3]**

Helen: Oh, I should have doubled **t**, then add **ed**.

R: Great! The last one?

Helen: **could!** **IPT[0]**

R: Great!

RPT=regular past tense, IPT=irregular past tense, PS=prepositions indicating space, [number]=written CF strategy, see The Graduated Written CF Strategies in Section 4.4.6.

It can be seen by the episodes that Helen was able to identify and correct almost all the errors as soon as her attention was drawn to the sentences in which the errors had occurred. Only for one regular past tense error did she require more explicit written CF assistance. When an error code was provided, she successfully produced the correct form. Table 6.17 presents the numbers of written CF strategies needed by Helen on each of the targeted linguistic errors in the written text of the immediate post-test. The number in the square brackets refers to the written CF strategies needed.

Table 6.17

Scaffolding written CF on each of the errors for Helen

<i>Regular past tense</i>	<i>Irregular past tense</i>	<i>Prepositions indicating space</i>
[0]exit-exited	[0]is-was	[0] on-in the recliner
[3]chated-chatted	[0]is-was	
	[0]get-got	
	[0]can-could	

[number]=written CF strategy, see *The Graduated Written CF Strategies in Section 4.4.6.*

It is obvious that very little assistance was needed for Helen to identify and correct most of the errors in the written text. She successfully corrected six out of seven errors by only having her attention drawn to the sentences in which the errors had occurred. She identified the regular past tense error but was not able to produce the correct form until an error code was provided.

Helen needed the minimum written CF assistance to correct the errors of all three targeted linguistic types. It may be because the dialogical interaction had raised her higher level of attention and she had engaged better in the cognitive processing. The better engagement and higher level of attention may have enabled Helen to sufficiently search her existing knowledge and retrieve the relevant explicit knowledge. Thus, she could correct the errors. However, she was not able to correct one of the regular past tense errors (*chated*) until the error code was provided by the researcher. It can be explained in two possible ways. First, it is possible that Helen did not have the explicit knowledge that *chatted* is the past tense form for *chat*. The error code informed her that it was a regular past tense error, which may

have enabled her to retrieve the rule that for some verbs, the last consonant needs to be doubled before adding *-ed*. Therefore, she may have formed a new hypothesis that this rule should apply to *chat*. It is also possible that Helen had this explicit knowledge, but it hadn't been processed as much as the explicit knowledge of the other six instances. Therefore, more explicit written CF assistance was needed to lead her to retrieve the relevant existing knowledge and process it with conscious attention. On the other hand, for the other six errors, the explicit knowledge may have been processed much more and may even be able to be consolidated very soon. This may be the reason why the six errors were easily identified and corrected by Helen.

In Section 6.2 it was concluded that less explicit written CF may be explicit enough for the learner to produce the correct forms when he/she has the explicit knowledge; but if not, more explicit written CF may be needed to help the learner to build up that knowledge. It may need to be added in this section that the extent to which written CF assistance is needed may also depend on to what extent the explicit/declarative knowledge has been processed/ proceduralized at that point (theoretical discussion see Section 2.2.2). If it has been processed in a controlled manner or the proceduralizing has taken place for a good number of times, minimum assistance may be needed to retrieve it (for example, in six out of the seven errors). However, if it hasn't been proceduralized or controlled processing hasn't happened to a large extent, more explicit written CF may be needed to direct the learner's attention to the relevant explicit knowledge (for example, *chated*).

In the previous written CF session, Helen had received underlining as her treatment. Although she used both the irregular past tense and prepositions indicating space with increased accuracy, underlining was found to not be explicit enough for her to correct one irregular past tense error and one preposition indicating space error. Scaffolded written CF may have provided written CF assistance that matched Helen's need for each of the errors, but whether or not it could lead to the improved accuracy needed to be tested.

6.3.1.2 The immediate effect of scaffolded written CF

As has been discussed in the Methodology chapter, after the provision of scaffolded written CF, each learner was asked to revise the written text of their delayed post-test 1, which had been completed two weeks prior in the main study. The immediate effectiveness of scaffolded written CF was revealed in the accuracy improvement after revision. The accuracy rates in the written text of their delayed post-test 1 (W3) and the revised version (R-W3) are presented in Table 6.18. In the case study, W3 is called the pre-scaffolded written CF test, and the revision of the written text (R-W3) is called the immediate effect test.

Table 6.18

Helen's accuracy rates before and immediately after receiving scaffolded written CF

	<i>Regular past tense</i>			<i>Irregular past tense</i>			<i>Prepositions indicating space</i>			<i>Total %</i>
	Error	OC	%	Error	OC	%	Error	OC	%	
Pre-scaffolded written CF test (W3)	1	4	75	7	19	63.16	0	4	100	79.39
Immediate effect test (R-W3)	0	4	100	3	19	86.96	0	4	100	95.65

OC=obligatory occasion, %=accuracy percentage

It can be seen that after receiving scaffolded written CF, Helen was able to identify and correct her only regular past tense error and four irregular past tense errors. The improved accuracy may indicate the effectiveness of scaffolded written CF, but it is still worth looking at whether or not the corrected errors bore direct relation to the scaffolded written CF she had received. Table 6.19 presents the errors which had received scaffolded written CF and the ones which were corrected by Helen during the revision.

Table 6.19

Helen's individual use of the targeted linguistic types before and immediately after receiving scaffolded written CF

	<i>Regular past tense</i>		<i>Irregular past tense</i>		<i>Prepositions indicating space</i>	
	Errors	Correct uses	Errors	Correct uses	Errors	Correct uses
Scaffolded written CF	chated-chatted [3] exit-exited [0]		is-was [0] (2), get-got[0], can-could [0]		on-in the recliner [0]	
Pre-scaffolded written CF test (W3)	<i>seem-seemed</i>	decided, wanted, stopped	<i>can-could, there were-was a car, the city were-was, an old lady were</i> , there were-was a part, there were-was a plane, standed-stood	went (3), got, were, felt, found, sat, saw (2), thought, was		in front of, at the corner of the street, at the bust station, in the sky
Immediate effect test (R-W3)		<i>seemed</i> decided, wanted, stopped	there were-was a part, there were-was a plane, standed-stood	<i>could, there was a car, the city was, an old lady was</i> , went (3), got, were, felt, found, sat, saw (2), thought, was		in front of, at the corner of the street, at the bust station, in the sky

[number]=written CF strategy, see *The Graduated Written CF Strategies* in Section 4.4.6, (number)=time of uses

After receiving scaffolded written CF on two regular past tense errors, Helen added *-ed* to *seem* in the revision without any assistance from the researcher, which may indicate the effectiveness of scaffolded written CF. When her attention was drawn to *is*, *get* and *can*, she corrected them instantly and she corrected *can* to *could* and, in some instances, *were* to *was* during the revision, which may also be evidence of the effectiveness of scaffolded written CF. She did not correct all instances when

were needed to be changed to *was*, but this may not prove the partial failure of scaffolded written CF because Helen was scaffolded to change *is* to *was*, which may have helped her understand the past tense form for *is* is *was*. However, she may not have understood that the use of *was* or *were* depends on the singular or plural form of the subject of the sentence. This may explain why some errors of the use of *were* remained after the revision. Therefore, the improved accuracy rates and the in-depth analysis of the individual use of the targeted linguistic types before and after scaffolding actually revealed the immediate effectiveness of scaffolded written CF.

6.3.1.3 The effect of scaffolded written CF over 10 weeks' time

Whether or not and the extent to which the effectiveness of scaffolded written CF could be retained over 10 weeks' time was tested in a new written text (W4, which was used to test the effectiveness of one session of written CF treatment over 16 weeks' time in the main study) and Table 6.20 shows the accuracy rates before and after scaffolded written CF immediately and over 10 weeks' time.

Table 6.20

Helen's accuracy rates of the targeted linguistic types throughout testing occasions

	<i>Regular past tense</i>			<i>Irregular past tense</i>			<i>Prepositions indicating space</i>			<i>Total %</i>
	Error	OC	%	Error	OC	%	Error	OC	%	
Pre-scaffolded written CF test (W3)	1	4	75	7	19	63.16	0	4	100	79.39
Immediate effect test (R-W3)	0	4	100	3	23	86.96	0	4	100	95.65
Long-term effect test (W4)	3	10	70	3	15	80	1	4	75	75

OC=obligatory occasion, %=accuracy percentage

It can be seen that in the long-term effect test, the accurate use of all three linguistic types decreased, however, the accuracy rates of the irregular past tense were still higher than the ones before the provision of scaffolded written CF. In spite of the decrease in accuracy rates, it is worth looking at whether or not there was additional evidence of the retention of the effectiveness of scaffolded written CF over 10

weeks' time. Table 6.21 presents each individual use of the targeted linguistic types throughout these testing occasions.

Table 6.21

Helen's individual use of the targeted linguistic types throughout testing occasions

	<i>Regular past tense</i>		<i>Irregular past tense</i>		<i>Prepositions indicating space</i>	
	Errors	Correct uses	Errors	Correct uses	Errors	Correct uses
Scaffolded written CF	chated - chatted[3] exit- exited [0]		is-was [0] (2), get- got[0], can-could [0]		on-in the recliner [0]	
Pre-scaffolded written CF test (W3)	<i>seem- seemed</i>	decided, wanted, stopped	<i>can- could, there were-was a car, the city were- was, an old lady were, there were-was a part, there were-was a plane, standed- stood</i>	went (3), got, were, felt, found, sat, saw (2), thought, was		in front of, at the corner of the street, at the bust station, in the sky
Immediate effect test (R-W3)		<i>seemed</i> decided, wanted, stopped	there were-was a part, there were-was a plane, standed- stood	<i>could, there was a car, the city was, an old lady was,</i> went (3), got, were, felt, found, sat, saw (2), thought, was		in front of, at the corner of the street, at the bust station, in the sky
Long-term effect test (W4)	like- liked Enjoy- enjoyed tripped- tripped	decided, looked, seemed, shouted, passed, enjoyed, liked	standed- stood, leave- left, wearing- wore	went, got, were (6), told, said, saw, was	at-in Xinjiang province	in the distance, on a bridge, on the river

[number]=written CF strategy, see *The Graduated Written CF Strategies in Section 4.4.6*, (number)=time of uses

It can be seen in the table above that Helen made more regular past tense errors in the long-term effect test than before she had received scaffolded written CF. However, two of the three errors (*like* and *enjoy*) were used correctly in the same piece of writing, which may mean that Helen had the explicit knowledge, but when attention was not sufficiently paid to the form, she may have forgotten to add *-ed* to make them the past tense forms. She directly added *-ed* to *trip* and this error seems closely related to the scaffolded written CF she had received as she did the same to *chat* and when error code was provided to her, she corrected the error and doubled the *t* and added *-ed*. It is true that error code was what Helen needed to correct the error; however, the scaffolded written CF may not have been able to benefit other linguistic instances which share the same rules with it. Thus, scaffolding may help the teacher to assess the learner's needs and provide written CF assistance just within his/her needs, so that the optimal L2 development may occur. However, it has to be noted that the assistance the learner needs on one linguistic instance may be different from on another one. That is, scaffolded written CF may be superior in facilitating the development of the specific linguistic knowledge which receives scaffolded written CF; however, it may not facilitate the development of other instances, even the ones which share the same rules.

Helen's accurate use of the irregular past tense decreased a little over ten weeks' time, but was still higher than before she received scaffolded written CF. Furthermore, three of the errors in the long-term effect test had not previously received scaffolded written CF; while the ones which had received scaffolded written CF 10 weeks earlier were either used correctly (*is*, *get*) or not used (*can*) in the long-term effect test.

Helen did not have prepositions indicating space errors in the pre-scaffolded test and the immediate effect test; however, the one error in the long-term effect test bore no direct relation to the scaffolded written CF.

To generalize the effectiveness of scaffolded written CF on the three targeted linguistic types for Helen, its immediate effectiveness on both the regular and irregular past tense was obvious. Although the accurate use of these forms decreased after 10 weeks, there was still evidence of the retention of the

effectiveness of scaffolded written CF (*seemed, got, was*). Helen used *liked* and *enjoyed* correctly and incorrectly in the same written text, which may indicate that she had the explicit knowledge. However, the knowledge may not have been proceduralized enough or controlled processing may not have taken place enough for it to be used accurately and fast without much conscious attention. In spite of its long-term effectiveness it has to be noted that scaffolded written CF may facilitate the development of the specific linguistic instance which receives scaffolded written CF, but may not be able to facilitate the development of other instances from the same linguistic category, regardless of their nature (rule-based or less rule-governed, idiosyncratic).

In Helen's case, the superiority of scaffolded written CF was not only found in the low degree of explicitness needed, but was also revealed in its facilitative role in the improvement of the accurate use of the regular and irregular past tense immediately. Although the accurate use of the regular past tense and prepositions indicating space decreased over ten weeks' time, there was no evidence found that the effectiveness of scaffolded written CF on the specific linguistic items was not retained at all. As has been mentioned in Section 6.2, Helen's proficiency level (114) is much higher than the average (102) of the higher proficiency group, which may indicate that she has good explicit knowledge. The good explicit knowledge may have enabled her to identify and correct most of the targeted linguistic errors with minimum written CF assistance and to retain the improved accuracy of the irregular past tense over 10 weeks' time.

6.3.2 Case Study 2: Mary from Error Code Group

6.3.2.1 Scaffolded written CF for Mary

Mary was scaffolded to correct her errors in the written text of the immediate post-test via The Graduated Written CF Strategies (See Section 4.4.6). The episodes of scaffolded written CF are presented below.

Episodes of scaffolded written CF for Mary:

R: You have more errors in the second piece of writing. Let's see whether or not you can identify and correct them. Is this sentence ok? In their right, a man fed birds... [0]

Mary: Oh, I should use **at** their right.

R: You found the error but at is still not correct. In means inside of something. For example, I am in the room. [4]

Mary: Hmm. I do not know which preposition to use.

R: You should use **on**. **On their right**. PS [5]

Mary: Ok. On the right. I know it now.

R: Ok. Another one. In the man's back, a child... PS[0]

Mary: hmm. I should use **at the back**.

R: Ok. Great. A man ride a horse? [0]

Mary: should it be r...a...I do not know.

R: Ok. It is an IPT error. [3]

Mary: Ok. But I do not know the form.

R: **r-o-d-e**. IPT[5]

Mary: Ok. It should be r-o-d-e. I will remember it.

RPT=regular past tense, IPT=irregular past tense, PS=prepositions indicating space, [number]=written CF strategy, see The Graduated Written CF Strategies in Section 4.4.6.

It can be seen in the episodes that Mary was only able to identify and correct one of the targeted linguistic errors with the minimum amount of written CF assistance, while more explicit written CF types were required on the others. Table 6.22 presents the number of written CF strategies Mary needed for each of the targeted linguistic errors.

Table 6.22

Scaffolded written CF on each of the errors for Mary

<i>Regular past tense</i>	<i>Irregular past tense</i>	<i>Prepositions indicating space</i>
	[5] ride-rod	[0]in-at the man's back
		[5]in-on their right

[number]=written CF strategy, see The Graduated Written CF Strategies in Section 4.4.6

It can be seen in Table 6.22 that Mary was able to identify and correct one of the two prepositions indicating space errors by only having her attention drawn to the sentence in which the error occurred. However, she failed to produce the correct form for the other prepositions indicating space error and the irregular past tense error. When the researcher then provided the correct form, Mary's response was '*I know it now*' and '*I will remember it*'. Mary's response may indicate that she hadn't had the explicit knowledge that *rode* is the past tense form of *ride* and *on* is used before *the right*. As has been discussed in Helen's case, the dialogical interaction may have drawn a higher level of the learner's attention to the error and the learner may have engaged better and had deeper cognitive processing of the scaffolded written CF. This may explain why one of the prepositions indicating space errors was corrected with the minimum written CF assistance. However, when the learner did not have the explicit knowledge of the specific linguistic instance (*on someone's right* and *rode*), it is unlikely that the correct form could be produced. It may be because for these idiosyncratic and complex linguistic forms there are no rules to help learners to form a new, correct hypothesis, only direct correction or direct correction plus metalinguistic explanation may be helpful as it may help the learner to build up the explicit knowledge. Mary also has a higher proficiency level (111/102). However, the written CF assistance she needed was more explicit than Helen, which may indicate that proficiency level is a quite general indicator of the learner's English knowledge or his/her ability to use it. It may not be able to indicate whether or not the learner has the explicit knowledge of the specific linguistic instances.

In the previous written CF treatment session, Mary received one session of error code treatment on her only error and her overall accuracy decreased in the immediate post-test. It was found that error code was not explicit enough for her to correct the error, and this may explain why she was not able to improve her accuracy in the subsequent writing task. As scaffolded written CF was within the learner's need for each of the errors, it is worth investigating whether or not scaffolded written CF could result in improved accuracy in the subsequent writing immediately and over time.

6.3.2.2 The immediate effect of scaffolded written CF

The accuracy rates before and after the provision of scaffolded written CF are presented in Table 6.23 below.

Table 6.23

Mary's accuracy rates before and immediately after receiving scaffolded written CF

	<i>Regular past tense</i>			<i>Irregular past tense</i>			<i>Prepositions indicating space</i>			<i>Total %</i>
	Error	OC	%	Error	OC	%	Error	OC	%	
Pre-scaffolded written CF test (W3)	0	2	100	7	14	50	4	4	0	50
Immediate effect test (R-W3)	0	2	100	7	14	50	2	4	50	66.67

OC=obligatory occasion, %=accuracy percentage

It can be seen that after receiving scaffolded written CF, Mary corrected two of the four prepositions indicating space errors and the accuracy rate increased from zero to 50%. It may indicate the immediate effectiveness of scaffolded written CF on prepositions indicating space. However, she did not correct the irregular past tense errors. It may be worth looking at each error which had received scaffolded written CF, and the errors which were corrected and which remained after revision. It may reveal additional evidence for the immediate effectiveness of scaffolded written CF (See Table 6.24).

Table 6.24

Mary's individual use of the targeted linguistic types before and immediately after receiving scaffolded written CF

	<i>Regular past tense</i>		<i>Irregular past tense</i>		<i>Prepositions indicating space</i>	
	Errors	Correct uses	Errors	Correct uses	Errors	Correct uses
Scaffolded written CF			ride-rode [5]		on-on their right [5], in-at his back [0]	
Pre-scaffolded written CF test (W3)		seemed, chatted	two people was-were (4), has-had (2), set-sat	had, was (4), were, did	_ -at the corner of the street, _ -in the recliner, at-on their right, in-on the bus	
Immediate effect test (R-W3)		seemed, chatted	two people was-were (4), has-had (2), set-sat	had, was (4), were, did s	_ -at the corner of the street, in-on the bus	<i>on their right, in the recliner</i>

[number]=written CF strategy, see The Graduated Written CF Strategies in Section 4.4.6, (number)=time of uses

After receiving direct correction on *ride*, Mary did not correct any of the irregular past tense errors in the revision, but *ride* was not one of the errors because it was not used in the written text of the pre-scaffolded written CF test (W3). Therefore, that no irregular past tense errors was corrected may not lead to the conclusion that scaffolded written CF on *ride* was unsuccessful. However, it may indicate that scaffolded written CF on one specific irregular past tense instance may not be able to benefit other instances.

Mary was not able to correct *in their right* to *on their right* and when the researcher provided the correct form, her response (*'I know it now'*) indicated that she hadn't had the explicit knowledge. In the revision, she identified and corrected the same error without any assistance, and it may clearly indicate the immediate effectiveness of scaffolded written CF. She also corrected another preposition indicating space error by adding *in* in front of *recliner*. The other two prepositions indicating space

errors remained, but they (*_ the corner of the street* and *in the bus*) were very different from the ones (*on their right* and *at the man's back*) which had received scaffolded written CF. Therefore, evidence of the immediate effectiveness of scaffolded written CF was found, but the errors that remained may not be counterevidence of its effectiveness.

6.3.2.3 The effect of scaffolded written CF over 10 weeks' time

Whether or not the effectiveness of scaffolded written CF could be retained over ten weeks' time was tested in a new written text (W4) and Table 6.25 shows the accuracy rates before and after scaffolded written CF immediately and over ten weeks' time.

Table 6.25

Mary's accuracy rates of the targeted linguistic types throughout testing occasions

	<i>Regular past tense</i>			<i>Irregular past tense</i>			<i>Prepositions indicating space</i>			<i>Total %</i>
	Error	OC	%	Error	OC	%	Error	OC	%	
Pre-scaffolded written CF test (W3)	0	2	100	7	14	50	4	4	0	50
Immediate effect test (R-W3)	0	2	100	7	14	50	2	4	50	66.67
Long-term effect test (W4)	0	2	100	4	18	77.78	1	3	66.67	81.48

OC=obligatory occasion, %=accuracy percentage

It can be seen that in the long-term effect test, the accurate use of both the irregular past tense and prepositions indicating space increased. However, it is worth looking at each individual use of the targeted linguistic types to find additional evidence of the retention of the effectiveness of scaffolded written CF (See Table 6.26 below).

Table 6.26

Mary's individual use of the targeted linguistic types throughout testing occasions

	<i>Regular past tense</i>		<i>Irregular past tense</i>		<i>Prepositions indicating space</i>	
	Errors	Correct uses	Errors	Correct uses	Errors	Correct uses
Scaffolded written CF			ride- <i>rode</i> [5]		in-on their right [0], in-at the man's back [5]	
Pre-scaffolded written CF test (W3)		seemed, chatted	two people was-were (4), has-had (2), set-sat	had, was (4), were, did	_ -at the corner of the street, _-in the recliner, at-on their right, in-on the bus	
Immediate effect test (R-W3)		seemed, chatted	two people was-were (4), has-had (2), set-sat	had, was (4), were, did	_ -at the corner of the street, in-on the bus	<i>on their right, in the recliner</i>
Long-term effect test (W4)		arrived, seemed	have-had, some people was-were (2), leaved-left	spent, went (3), got, took (3), had (4), ate, was	arrived in-at a village	on the river, on the ground

[number]=written CF strategy, see *The Graduated Written CF Strategies in Section 4.4.6*, (number)=time of uses

Mary did have improved accuracy in the long-term effect test, but the errors which had received scaffolded written CF were not used, so direct evidence of the long-term effectiveness of scaffolded written CF could not be traced. However, what has to be noted is that Mary used *people was* numerous times in delayed post-test 1 (W3) and in the long-term effect test (W4). This provided very obvious evidence that errors may remain when no written CF is provided, which may be very harmful for the learners. Such findings may indicate the necessity and importance of written CF on learner's L2 development. The only preposition indicating space error (*arrived in a village*) in the long-term effect test did not bear relation to the

scaffolded written CF (*on their right* and *at the man's back*). Although other instances of the irregular past tense and prepositions indicating space were used correctly, it may or may not be due to the scaffolded written CF she had received. However, it is very likely that scaffolded written CF raised Mary's attention regarding the accurate use of these targeted linguistic types, and it may explain why she was able to improve her accuracy over ten weeks' time.

Unlike Helen's case, clear and direct evidence of the immediate effectiveness of written CF on prepositions indicating space was found for Mary's case. Although her accurate use of the irregular past tense and prepositions indicating space continued to increase in ten weeks' time, there was no additional evidence to support the retention of the effectiveness of scaffolded written CF. It needs to be noted that Mary's proficiency level (111) is also much higher than the average (102) of the higher proficiency group, and it may indicate that she has good explicit knowledge. Thus, the good explicit knowledge may have enabled her to use other instances of the targeted linguistic types with improved accuracy over ten weeks' time after her attention was raised via scaffolding.

6.3.3 Case Study 3: Sue from Metalinguistic Explanation Group

6.3.3.1 Scaffolded written CF for Sue

Sue was scaffolded to correct the errors in the written text of the immediate post-test via The Graduated Written CF Strategies (See Section 4.4.6). The episodes of scaffolded written CF are presented below.

Episodes of scaffolded written CF for Sue:

R: Let's have a look and see whether or not you can identify and correct the errors.

Sue: ok.

R: You have a look of this sentence.

Sue: Oh, I should always use **was**, not is. **IPT [0]**

R: Yes. Good. Carry on.

Sue: I should use **talked** instead of talk. **RPT [0]**

R: is a sign?

Sue: Oh, **was**. **IPT[0]**

R: Good. Many birds were in the land?

Sue: Ur...**on**? **PS [0]**

R: Yes, because it is on the surface of the land, right?

Sue: Yes.

R: good. Everyone wear shorts in the day? **[0]**

Sue: hmm. What is wrong?

R: wear shorts? **[1]**

Sue: hmm?

R: wear is the error here. **[2]**

Sue: **worn**?

R: No. worn is the past participle. **[4]**

Sue: Then I do not know.

R: **wore**. **IPT [5]**

Sue: Ok. wore is the past simple tense for wear.

R: The trees was in front of the house?

Sue: **were**. **PS [0]**

R: Ann's son were over there, feeding the birds?

Sue: **was**. **IPT [0]**

R: They are there, chatting with each other?

Sue: **were**. **IPT [0]**

RPT=regular past tense, IPT=irregular past tense, PS=prepositions indicating space, [number]=written CF strategy, see The Graduated Written CF Strategies in Section 4.4.6.

It can be seen in the episodes that Sue was able to identify and correct almost all the errors as soon as her attention was drawn to the sentences in which the errors occurred. However, Sue was unable to correct one of the irregular past tense errors and her response ('*wore is the past tense form for wear*') to the correct form provided by the researcher may indicate that she hadn't had the explicit knowledge. Table 6.27 presents the number of the written CF strategies Sue needed on each of the errors.

Table 6.27

Scaffolded written CF on each of the errors for Sue

<i>Regular past tense</i>	<i>Irregular past tense</i>	<i>Prepositions indicating space</i>
[0] talk-talked	[0] is-was (6)	[0] in-on the land
	[5] wear-wore	
	[0] are, was-were (2)	
	[0] were-was	

[number]=written CF strategy, see The Graduated Written CF Strategies in Section 4.4.6, (number)=time of uses

It is very obvious that the written CF assistance needed by Sue was much less explicit than metalinguistic explanation, which was the written CF treatment she had received previously. Sue was able to identify and correct eleven out of twelve errors by only having her attention drawn to the sentences in which the errors had occurred, which may be because the dialogical interaction allowed her to retrieve the explicit knowledge and process it with a lot of attention. However, in the other instance, she did not even identify the irregular past tense error until the researcher underlined it (*wear*). She was not able to correct it when metalinguistic explanation was provided by the researcher. It may indicate that she hadn't had the explicit knowledge of the past tense form for *wear*. In this case, more explicit types of written CF (direct correction and direct correction plus metalinguistic explanation) were needed as they could help the learner build up the explicit knowledge.

In the previous written CF treatment session, Sue received metalinguistic explanation as her treatment and it did not enable her to use the targeted linguistic types with improved accuracy in the subsequent writing task. Metalinguistic explanation on two regular past tense and two irregular past tense errors was not

explicit enough for Sue to produce the correct forms, and it may explain her failure to benefit from one session of metalinguistic explanation. Scaffolded written CF provided explicit assistance that matched Sue's need for each of the errors, and whether or not it can lead to the improved accuracy was tested in the immediate effect test.

6.3.3.2 The immediate effect of scaffolded written CF

The accuracy rates before and after the provision of scaffolded written CF are presented in Table 6.28 below.

Table 6.28

Sue's accuracy rates before and immediately after receiving scaffolded written CF

	<i>Regular past tense</i>			<i>Irregular past tense</i>			<i>Prepositions indicating space</i>			<i>Total %</i>
	Error	OC	%	Error	OC	%	Error	OC	%	
Pre-scaffolded written CF test (W3)	0	4	100	13	20	35	2	2	0	45
Immediate effect test (R-W3)	0	4	100	10	20	50	2	2	0	50

OC=obligatory occasion, %=accuracy percentage

It can be seen that after receiving scaffolded written CF, Sue was able to identify and correct three irregular past tense errors, which may prove the effectiveness of scaffolded written CF to a large extent. However, it is still worth looking at whether or not the corrected errors bore direct relation to the scaffolded written CF she had received. Table 6.29 represents the errors which had received scaffolded written CF and the ones which were corrected by Sue during the revision.

Table 6.29

Sue's individual use of the targeted linguistic types before and immediately after receiving scaffolded written CF

	<i>Regular past tense</i>		<i>Irregular past tense</i>		<i>Prepositions indicating space</i>	
	Errors	Correct uses	Errors	Correct uses	Errors	Correct uses
Scaffolded written CF	talk-talked [0]		is-was (6) [0], wear-wore [5], are/was-were (2) [0], were-was [0]		in-on the land [0]	
Pre-scaffolded written CF test (W3)		looked (2), pointed, talked	have-had (4), people are-were, take-took (2), is-was(3), go-went (2), two boys was-were	was (4), gave (2), had	in-on the face, _-on the right side of the bus	
Immediate effect test (R-W3)		looked (2), pointed, talked	have-had (2), take-took (2), is-was (3), go-went (2)two boys was-were	had (2), people were, was (4), gave (2), had	in-on the face, _-on the right side of the bus	

[number]=written CF strategy, see The Graduated Written CF Strategies in Section 4.4.6, (number)=time of uses

It can be seen that after receiving scaffolded written CF, Sue only identified and corrected three out of thirteen irregular past tense errors. One of the corrected errors (*are-were*) was closely related to the scaffolded written CF and could be evidence of the effectiveness of scaffolded written CF. However, more errors remained than were corrected, which may be because Sue's proficiency level was much lower than the average of the lower proficiency group (87/102). It may mean that either she had very limited explicit knowledge, or the explicit knowledge had not been proceduralized well or controlled processing had not taken place to a large extent. Thus, Sue was unable to retrieve the explicit knowledge to identify and correct the

irregular past tense and prepositions indicating space errors even when her attention was mainly focused on the forms in the revision.

6.3.3.3 The effect of scaffolded written CF over 10 weeks' time

Sue's accurate use of the irregular past tense increased after receiving scaffolded written CF, although not all the errors were corrected during revision. Whether or not the initial effectiveness of scaffolded written CF could be retained over ten weeks' time was tested in a new written text (W4) and Table 6.30 shows the accuracy rates before and after scaffolded written CF immediately and over ten weeks' time.

Table 6.30

Sue's accuracy rates of the targeted linguistic types throughout testing occasions

	<i>Regular past tense</i>			<i>Irregular past tense</i>			<i>Prepositions indicating space</i>			<i>Total %</i>
	Error	OC	%	Error	OC	%	Error	OC	%	
Pre-scaffolded written CF test (W3)	0	4	100	13	20	35	2	2	0	45
Immediate effect test (R-W3)	0	4	100	10	20	50	2	2	0	50
Long-term effect test (W4)	0	1	100	9	24	62.50	2	2	0	54.17

OC=obligatory occasion, %=accuracy percentage

In the long-term effect test, Sue still used the regular past tense correctly and prepositions indicating space all incorrectly as in the immediate effect test. She used the irregular past tense with continuous improved accuracy in the long-term effect test, but it is still worth investigating whether or not additional evidence could be found to support that the effectiveness of scaffolded written CF was retained over ten weeks' time (See Table 6.31 below).

Table 6.31

Sue's individual use of the targeted linguistic types throughout testing occasions

	<i>Regular past tense</i>		<i>Irregular past tense</i>		<i>Prepositions indicating space</i>	
	Errors	Correct uses	Errors	Correct uses	Errors	Correct uses
Scaffolded written CF	talk-talked [0]		is-was (6) [0], wear-wore [5], are/was-were (2) [0], were-was [0]		in-on the land [0]	
Pre-scaffolded written CF test (W3)		looked (2), pointed, talked	<i>have-had (4), people are-were,</i> take-took (2), is-was(3), go-went (2), two boys was-were	was (4), gave (2), had	in-on the face, _-on the right side of the bus	
Immediate effect test (R-W3)		looked (2), pointed, talked	have-had (2), take-took (2), is-was (3), go-went (2)two boys was-were	<i>had (2), people were,</i> was (4), gave (2), had	in-on the face, _-on the right side of the bus	
Long-term effect test (W4)		covered	is-was, have-had (3), are-were, it-was, flied-flew, think-thought, were-was	was (5), had (4), ate, were (5)	_ -on the right side of (3), in- _ there	

[number]=written CF strategy, see *The Graduated Written CF Strategies in Section 4.4.6*, (number)=time of uses

It can be seen that Sue used *had*, *was* and *were* correctly more often than incorrectly in the long-term effect test, which may be evidence for the retention of the effectiveness of the scaffolded written CF over 10 weeks' time. She did use all the prepositions indicating space incorrectly, but the two errors (*_ the right and in there*) bore no relation to the one (*many birds were in the land*) which had received scaffolded written CF 10 weeks ago. Furthermore, as in Mary's case, there is obvious evidence that when the error was not pointed out, the learner kept making it, and it may be very harmful for L2 development. For example, Sue did not use *on* before *the right side* in delayed post-test 1, and she made the same error three times in the subsequent writing task. This may be evidence of the importance of written CF because although a learner may not be able to use the instance which

has received written CF correctly even in the immediate written text, at least it is very likely the learner will not use the same incorrect form again. Therefore, if one session of written CF can not lead to the development of explicit knowledge or the consolidation of explicit knowledge, it can at least prevent the incorrect hypothesis becoming his/her consolidated knowledge.

In the previous written CF session, Sue had received one session of metalinguistic explanation treatment and it did not enable her to use the targeted linguistic types more accurately immediately after the treatment. Metalinguistic explanation was found not explicit enough for Sue to produce the correct forms, and this may have prevented her from benefitting from the treatment. The scaffolded written CF did enable Sue to use the irregular past tense more accurately and additional evidence was found to support the immediate effectiveness of scaffolded written CF and its retention over 10 weeks' time. However, not all the irregular past tense errors which had received scaffolded written CF were correctly used in the immediate and long-term effect tests. Perhaps this is because Sue's proficiency level was quite low. On the one hand, she may not have had much explicit knowledge; on the other hand, she may not have been able to afford sufficient attention to process the explicit knowledge of a number of specific linguistic instances in a controlled matter at the same time.

6.3.4 Case Study 4: Shirley from Direct Correction Group

6.3.4.1 Scaffolded written CF for Shirley

Shirley was scaffolded to correct her errors in the written text of the immediate post-test via The Graduated Written CF Strategies (See Section 4.4.6). The episodes of scaffolded written CF are presented below.

Episodes of scaffolded written CF for Shirley:

R: Let's see whether or not you are able to identify and correct the errors in this piece of writing.

Shirley: Ok.

R: Is this sentence alright?

Shirley: No. they sat on the recliner? **[0]**

R: not really.

Shirley: I know I need a preposition, but if not on, I do not know which one to use.

R: **In. PS[5]**

Shirley: Oh, my middle school teacher taught me this, for armchair we use **in**, for bench we use **on**. So **in** is for recliner as well.

R: Next one. The bus stoped? **RPT[0]**

Shirley: Oh, double **p** then add **-ed**.

R: Great! The bird was at her leg? **PS[0]**

Shirley: **On** her leg.

R: They played in the ground? **PS[0]**

Shirley: **on** the ground.

R: Good. Next sentence? **PS[0]**

Shirley: **on** the grass.

R: Well done. Next one? **PS[0]**

Shirley: **in** a little green field.

RPT=regular past tense, IPT=irregular past tense, PS=prepositions indicating space, [number]=written CF strategy, see The Graduated Written CF Strategies in Section 4.4.6.

R: I saw something at the distance? [0]

Shirley: hmm

R: at the distance? [1]

Shirley: hmm

R: at? **PS**[2]

Shirley: Oh, **in** the distance.

R: Fantastic. He standed there? [0]

Shirley: hmm

R: standed? [1]

Shirley: hmm

R: it is an irregular past tense error. [3]

Shirley: hmm

R: you can not just add -ed to some verbs to make past tense form. There is no regular rule to follow. For example, I forgot my book. [4]

Shirley: Hmm

R: it is **stood**. **IPT**[5]

Shirley: Oh, the irregular past tense is stood. Ok. I have to remember it now.

R: next sentence? [0]

Shirley: what is wrong here?

R: rid a horse? [1]

Shirley: ride?

R: it is also an irregular past tense error. **IPT**[3]

Shirley: I think I should change **i** to **o**.

R: Yes. **Rode**.

RPT=regular past tense, IPT=irregular past tense, PS=prepositions indicating space, [number]=written CF strategy, see The Graduated Written CF Strategies in Section 4.4.6.

It can be seen in the episodes that Shirley was able to identify and correct the majority of the errors as soon as her attention was drawn to the sentences in which the errors occurred. However, both of the irregular past tense errors required further written CF assistance, as did two out of six prepositions indicating space errors.

Table 6.32 presents the number of the written CF strategies Shirley needed on each of the errors.

Table 6.32

Scaffolded written CF on each of the errors for Shirley

<i>Regular past tense</i>	<i>Irregular past tense</i>	<i>Prepositions indicating space</i>
[0] stopped	[5] stood	[5] in the recliner
	[3] rode	[0] On her leg
		[0] On the ground
		[0] On the grass
		[0] in a little green field
		[2] In the distance

[number]=written CF strategy, see *The Graduated Written CF Strategies in Section 4.4.6*

Shirley had received one session of direct correction treatment previously and it did not enable her to use the targeted linguistic types more accurately in the subsequent writing although direct correction was explicit enough for her to understand the correct forms. However, during the scaffolding, only two out of nine errors required direct correction. Shirley corrected one of the errors when it was underlined and another one when error code was provided. In the other instances, she identified and corrected the only regular past tense error and the other four prepositions indicating space errors by only having her attention drawn to the sentences in which the errors occurred. On the one hand, the dialogical interaction between Shirley and the researcher may have better engaged Shirley in deeper cognitive processing; on the other hand, Shirley may have had the explicit knowledge of these linguistic instances, which may explain why less explicit written CF was explicit enough for her to correct the majority of the errors. However, she needed direct correction on *standed* and *_ the recliner*, which may indicate that she did not have the explicit knowledge of those specific instances. Scaffolded written CF provided explicit assistance that matched Shirley's need for each of the errors, and whether or not it can lead to the improved accuracy in subsequent writing needed to be tested.

6.3.4.2 The immediate effect of scaffolded written CF

The accuracy rates before and after the provision of scaffolded written CF are presented in Table 6.33 below.

Table 6.33

Shirley's accuracy rates before and immediately after receiving scaffolded written CF

	<i>Regular past tense</i>			<i>Irregular past tense</i>			<i>Prepositions indicating space</i>			<i>Total %</i>
	Error	OC	%	Error	OC	%	Error	OC	%	
Pre-scaffolded written CF test (W3)	0	7	100	2	13	84.62	4	8	50	78.21
Immediate effect test (R-W3)	0	7	100	2	13	84.62	2	8	75.00	86.54

OC=obligatory occasion, %=accuracy percentage

It can be seen that after receiving scaffolded written CF, Shirley corrected two out of the four prepositions indicating space errors and her accuracy rate increased. It may indicate the immediate effectiveness of scaffolded written CF on prepositions indicating space. However, it is worth seeking additional evidence of its effectiveness and finding out whether or not scaffolded written CF was effective on the irregular past tense since the two errors still remained (See Table 6.34).

Table 6.34

Shirley's individual use of the targeted linguistic types before and immediately after receiving scaffolded written CF

	<i>Regular past tense</i>		<i>Irregular past tense</i>		<i>Prepositions indicating space</i>	
	Errors	Correct uses	Errors	Correct uses	Errors	Correct uses
Scaffolded written CF	stoped-stopped [0]		standed-stood [5], rid-rod [3]		_in the recliner [5], at-on her leg [0], in-on the ground [0], at-on the grass [0], at-in the distance [2], _in a little green field [0]	
Pre-scaffolded written CF test (W3)		started, needed, painted, argued, talked, walked, stopped	There were-was a house, rade-rod	told, had (5), was, would (2), felt, came	two roads _ on the right, on-in the store, _on the corner of the street, at-beside the girl	on the corner of the street, in the house, in front of, on the grass
Immediate effect test (R-W3)		started, needed, painted, argued, talked, walked, stopped	There were-was a house, rade-rod	told, had (5), was, would (2), felt, came	two roads _ on the right, on-in the store	on the corner of the street, in the house, in front of, on the grass, beside the girl, on the corner of the street

[number]=written CF strategy, see The Graduated Written CF Strategies in Section 4.4.6, (number)=time of uses

After receiving scaffolded written CF, Shirley identified one of the irregular past tense errors and changed the form (*rade to rod*), which may have resulted from the scaffolded written CF. Shirley changed *rade* to *rode* when error code was provided by the researcher during the scaffolding. That she was able to identify the same error in another written text may result from the scaffolded written CF she had received. However, she was not able to produce the correct form. Instead, she changed *rade* to *rod* (*e* was missing). It can be explained in two possible ways. First, it is possible that the dialogical interaction may have triggered deeper cognitive

processing, so that Shirley was able to retrieve the explicit knowledge. However, the explicit knowledge hadn't been consolidated, and thus she was not able to retrieve the knowledge when her attention was not raised as much as in interaction. It is also possible that error code hadn't enable Shirley to build up her explicit knowledge. Instead, she just formed a new, correct hypothesis of the past tense form for *ride*. However, the hypothesis had not been stored in her short-term memory, and thus she was not able to refer to when correcting *rade*. In this case, another session of more explicit written CF (for example, direct correction) may be needed for her to build up the explicit knowledge. Although this error was not corrected, her attempt to change the form may also indicate the immediate effectiveness of scaffolded written CF. The other error (*were-was*) that remained after revision did not receive scaffolded written CF, thus it may not be evidence of the ineffectiveness of scaffolded written CF.

The two prepositions indicating space errors which were corrected in the revision (*beside the girl* and *on the corner of the street*) hadn't received scaffolded written CF. However, the scaffolded written CF may have raised Shirley's attention to the accurate use of prepositions indicating space. Thus, she was able to correct two of the four errors when she had the explicit knowledge. The errors that remained also did not bear direct relation to the scaffolded written CF, thus may not be counterevidence for the immediate effectiveness of scaffolded written CF.

6.3.4.3 The effect of scaffolded written CF over 10 weeks' time

Whether or not and the extent to which Shirley was able to use the targeted linguistic types with improved accuracy over ten weeks' time was tested in a new written text (W4) and Table 6.35 shows the accuracy rates before and after scaffolded written CF immediately and over ten weeks' time.

Table 6.35

Shirley's accuracy rates of the targeted linguistic types throughout testing occasions

	<i>Regular past tense</i>			<i>Irregular past tense</i>			<i>Prepositions indicating space</i>			<i>Total %</i>
	Error	OC	%	Error	OC	%	Error	OC	%	
Pre-scaffolded written CF test (W3)	0	7	100	2	13	84.62	4	8	50	78.21
Immediate effect test (R-W3)	0	7	100	2	13	84.62	2	8	75	86.54
Long-term effect test (W4)	3	9	66.67	1	10	90	2	4	50	68.89

OC=obligatory occasion, %=accuracy percentage

It can be seen that Shirley's accurate use of the regular past tense decreased over ten weeks' time. However, this may not be counterevidence of the retention of the effectiveness of scaffolded written CF, because scaffolded was not provided on regular past tense as no regular past tense errors had occurred in the written text of immediate post-test. She used the irregular past tense with further improvement, and whether or not there was additional evidence for the retention of the effectiveness of scaffolded written CF needed to be investigated. Furthermore, her accurate use of prepositions indicating space decreased to the rate before scaffolded written CF was provided, so it is worth looking at whether or not it may be the evidence or counterevidence of the long-term effectiveness of scaffolded written CF (See Table 6.36 below).

Table 6.36

Shirley's individual use of the targeted linguistic types throughout testing occasions

	<i>Regular past tense</i>		<i>Irregular past tense</i>		<i>Prepositions indicating space</i>	
	Errors	Correct uses	Errors	Correct uses	Errors	Correct uses
Scaffolded written CF	stoped-stopped [0]		standed-stood [5], rid-rode [3]		_ -in the recliner [5], at-on her leg [0], in-on the ground [0], at-on the grass [0],at-in the distance [2], _ -in a little green field [0]	
Pre-scaffolded written CF test (W3)		started, needed, painted, argued, talked, walked, stopped	There were-was a house, rade-rode	told, had (5), was, would (2), felt, came	two roads_-on the right, on-in the store, _ -on the corner of the street, at-beside the girl	on the corner of the street, in the house, in front of, on the grass
Immediate effect test (R-W3)		started, needed, painted, argued, talked, walked, stopped	There were-was a house, rade-rod	told, had (5), was, would (2), felt, came	two roads_-on the right, on-in the store	on the corner of the street, in the house, in front of, on the grass, beside the girl, on the corner of the street
Long-term effect test (W4)	planed-planned, float-floated, prefered-preferred	seemed, liked, extended, discovered, climbed, loved	fall-fell	had(2), was (3), thought, ate, flew, saw	on-in the blue sky, boat on-in the lake	in a clean world, on the grass

[number]=written CF strategy, see *The Graduated Written CF Strategies in Section 4.4.6*, (number)=time of uses

In the long-term effect test, Shirley only made one irregular past tense error (*fall-fell*) and it had not received scaffolded written CF ten weeks ago. She did not use *was* incorrectly as in the immediate post-test. Therefore, the scaffolded written CF may have been able to raise Shirley's attention regarding the use of the irregular past tense over ten weeks' time, so that she could use it with further improved accuracy.

Shirley corrected two prepositions indicating space errors immediately after receiving scaffolded written CF, which may prove the effectiveness of scaffolded written CF. Her accurate use of prepositions indicating space decreased to the accuracy rate before the provision of scaffolded written CF; but the two new errors (*on the blue sky* and *boat on the lake*) were very different from the ones which had received scaffolded written CF. In addition, Shirley corrected *at the grass* to *on the grass* with the provision of the minimum written CF assistance during the scaffolding. In the long-term effect test she used *on the grass* correctly, which may indicate that the effectiveness of scaffolded written CF was retained successfully. It also needs to be noted that Shirley's proficiency level is quite high although she belongs to the lower proficiency group (101/102). This may mean that she had good explicit knowledge and it may explain her need for minimum amount of written CF assistance during the scaffolding and her success in benefiting from the scaffolded written CF over ten weeks' time.

6.3.5 Case study 5: Anna from Direct Correction Plus Metalinguistic Explanation Group

6.3.5.1 Scaffolded written CF for Anna

Anna was scaffolded to correct her errors in the written text of the immediate post-test via The Graduated Written CF Strategies (See Section 4.4.6). The episodes of scaffolded written CF are presented below.

Episodes of scaffolded written CF for Anna:

R: Let's look at the errors in your second piece of writing and see whether or not you can correct them yourself. How about the first sentence?
Anna: Oh. I should use the infinitive verb after to. spend. IPT [0]
R: next sentence?
Anna: I should use past tense.
R: What is it?
Anna: sat. IPT [0]
R: Ok. Two women sat in the bench.
Anna: on the bench. PS [0]
R: next sentence?
Anna: No. it should be were. IPT [0]
R: Ok. They looks so happy?
Anna: Oh, no. past tense. Ur.. -ed. RPT [0]
R: so add -ed to look?
Anna: Yes, looked.
Anna: Here in this sentence, I should use was. IPT [0]
R: play sports from the picture?
Anna: Oh, in the picture. PS [0]

RPT=regular past tense, IPT=irregular past tense, PS=prepositions indicating space, [number]=written CF strategy, see The Graduated Written CF Strategies in Section 4.4.6.

It can be seen in the episodes that Anna was able to identify and correct all the errors as soon as her attention was drawn to the sentences in which the errors had occurred. Table 6.37 presents the number of the written CF strategies needed by Anna on each of the errors.

Table 6.37

Scaffolded written CF on each of the errors for Anna

<i>Regular past tense</i>	<i>Irregular past tense</i>	<i>Prepositions indicating space</i>
[0] looks-looked	[0] sit-sat	[0] in-on the bench
	[0] are-were	[0] from-in the picture
	[0] is-was	
	[0] to spent-to spend	

[number]=written CF strategy, see *The Graduated Written CF Strategies in Section 4.4.6*

Anna had previously received one session of the most explicit written CF treatment (direct correction plus metalinguistic explanation), but it did not enable her to use the targeted linguistic types more accurately in the subsequent writing. During the scaffolding, she was able to identify and correct all her errors by only having her attention drawn to the sentences in which the errors occurred. The dialogical interaction may have engaged her in deeper cognitive processing to retrieve the explicit knowledge. However, whether or not and the extent to which the less explicit but highly engaging scaffolded written CF could result in the improved accuracy in the subsequent writing needed to be investigated.

6.3.5.2 The immediate effect of scaffolded written CF

The accuracy rates before and after the provision of scaffolded written CF are presented in Table 6.38 below.

Table 6.38

Anna's accuracy rates before and immediately after receiving scaffolded written CF

	<i>Regular past tense</i>			<i>Irregular past tense</i>			<i>Prepositions indicating space</i>			<i>Total %</i>
	Error	OC	%	Error	OC	%	Error	OC	%	
Pre-scaffolded written CF test (W3)	1	2	50	8	15	46.67	0	6	100	65.56
Immediate effect test (R-W3)	0	2	100	1	15	93.33	0	6	100	97.78

OC=obligatory occasion, %=accuracy percentage

It can be seen that after receiving scaffolded written CF, Anna corrected one of the two regular past tense errors and seven out of eight irregular past tense errors, thus the total accuracy rate increased to a large extent. However, it is still worth looking

at whether or not there is additional evidence that the improved accuracy have resulted from scaffolded written CF (See Table 6.39 below).

Table 6.39

Anna's individual use of the targeted linguistic types before and immediately after receiving scaffolded written CF

	<i>Regular past tense</i>		<i>Irregular past tense</i>		<i>Prepositions indicating space</i>	
	Errors	Correct uses	Errors	Correct uses	Errors	Correct uses
Scaffolded written CF	looks-looked [0]		sit-sat [0], are-were [0], is-was [0], to spent-to spend [0]		in-on the bench [0], from-in the picture [0]	
Pre-scaffolded written CF test (W3)	walk-walked	wanted	were having-had, was drawing-drew, was buying-bought, having-had, ride-rode, is-was (2), has-had	was (6), had		in the city, on the face, by the table, on the road (2), in the sky
Immediate effect test (R-W3)		<i>walked</i> , wanted	has-had	<i>drew, bought, rode, was (8), had (3)</i>		in the city, on the face, by the table, on the road (2), in the sky

[number]=written CF strategy, see *The Graduated Written CF Strategies in Section 4.4.6*, (number)=time of uses

After receiving scaffolded written CF, Anna identified and corrected all her errors except one irregular past tense error. Anna used the past continuous tense in delayed post-test 1 and after receiving scaffolded written CF, she changed past continuous tense into past simple tense and used all the irregular past tense forms correctly except one (*has-had*). However, she used *had* three times in the same written text. This error might either be a careless mistake, or indicate that the knowledge of this instance hadn't been processed enough to be consolidated. A high level of effectiveness of scaffolded written CF was revealed in Anna's case. Not only was the specific error (*was*) which had received scaffolded written CF corrected by her, she also identified and corrected other instances of the targeted linguistic types.

However, whether or not and the extent to which the effectiveness of scaffolded written CF could be retained over time needed to be tested.

6.3.5.3 The effect of scaffolded written CF over 10 weeks' time

Whether or not and the extent to which Anna was able to use the targeted linguistic types with improved accuracy over ten weeks' time was tested in a new written text (W4) and Table 6.40 shows the accuracy rates before and after scaffolded written CF immediately and over ten weeks' time.

Table 6.40

Anna's accuracy rates of the targeted linguistic types throughout testing occasions

	<i>Regular past tense</i>			<i>Irregular past tense</i>			<i>Prepositions indicating space</i>			<i>Total %</i>
	Error	OC	%	Error	OC	%	Error	OC	%	
Pre-scaffolded written CF test (W3)	1	2	50	8	15	46.67	0	6	100	65.56
Immediate effect test (R-W3)	0	2	100	1	15	93.33	0	6	100	97.78
Long-term effect test (W4)	2	2	0	3	8	62.50	1	2	50	37.50

OC=obligatory occasion, %=accuracy percentage

In the long-term effect test, Anna's accurate use of both the regular past tense and prepositions indicating space decreased and was even lower than before the provision of scaffolded written CF. Although more irregular past tense errors occurred than in the immediate effect test, the accuracy rate was still higher than before the provision of scaffolded written CF. Whether or not the decreased accuracy rates can be evidence that the effectiveness of scaffolded written CF wasn't successfully retained needed to be investigated by looking at each individual use of the targeted linguistic types throughout the testing occasions.

Table 6.41

Anna's individual use of the targeted linguistic types throughout testing occasions

	<i>Regular past tense</i>		<i>Irregular past tense</i>		<i>Prepositions indicating space</i>	
	Errors	Correct uses	Errors	Correct uses	Errors	Correct uses
Scaffolded written CF	looks-looked [0]		sit-sat [0], are-were [0], is-was [0], to spent-to spend [0]		in-on the bench [0], from-in the picture [0]	
Pre-scaffolded written CF test (W3)	walk-walked	wanted	were having-had, was drawing-drew, was buying-bought, having-had, ride-rode, is-was (2), has-had	was (6), had		in the city, on the face, by the table, on the road (2), in the sky
Immediate effect test (R-W3)		<i>walked</i> , wanted	has-had	<i>drew, bought, rode, was (8), had (3)</i>		in the city, on the face, by the table, on the road (2), in the sky
Long-term effect test (W4)	looks – looked (2)		were-was, is-was, run-ran	was, went (2), ate, were	in-on the path	above the river

[number]=written CF strategy, see *The Graduated Written CF Strategies in Section 4.4.6*, (number)=time of uses

It can be seen that during scaffolding, Anna identified and corrected the regular past tense error (*looks-looked*) as soon as her attention was drawn to the sentence in which the error occurred. Moreover, she corrected the regular past tense error without any written CF assistance in the revision. However, the exact same error occurred again after ten weeks. One of the irregular past tense errors (*is-was*) also reoccurred in the long-term effect test. The reoccurrence of the errors which had received scaffolded written CF may indicate that the effectiveness of scaffolded written CF was not successfully retained over ten weeks' time. However, it has to be noted that Anna's accuracy rate of the irregular past tense was still higher than before scaffolded written CF was provided. Besides, the decreased accuracy of

prepositions indicating space over ten weeks' time may not be counterevidence of the failure of scaffolded written CF on prepositions indicating space because the errors (*in the bench* and *from the picture*) which had received scaffolded written CF were very different from the error (*in the path*) that occurred in the long-term effect test.

Throughout the scaffolding and in the immediate and long-term effect tests, some of the regular (*looks-looked*) and irregular past tense errors (*is-was*) which were corrected by Anna without any written CF assistance reoccurred after ten weeks' time. It may mean that when she had to pay attention to both meaning and forms, she may not have been able to refer to the explicit knowledge and retrieve the correct form. However, some of the irregular past tense forms (*was, were*) were used correctly in the long-term effect test. Therefore, it is reasonable to conclude that the effectiveness of scaffolded written CF was partially retained. Furthermore, there seemed to be no relation between the complexity of the targeted linguistic types (simple rule-based or more complex and idiosyncratic) and the retention of the effectiveness of scaffolded written CF. Whether or not and the extent to which the effectiveness could be retained may depend on the learner's explicit knowledge and the extent of the proceduralization or the controlled processing of explicit knowledge.

It has to be noted that Anna has a quite high proficiency level (106/102), which may explain why she identified and corrected the errors with the minimum amount of written CF assistance and was able to use other instances of the targeted linguistic types correctly in the subsequent writing. More sessions of written CF, even types with a very low degree of explicitness (e.g. underling) may enable her to use the targeted linguistic types with improved accuracy over time.

6.3.6. Summary and discussion of the findings of RQ6

RQ6 investigated to what extent the provision of scaffolded written CF facilitates improved accuracy for Chinese EFL learners whose overall accuracy rate decreased after a single session of written CF treatment. In the case study, each of the participants was scaffolded to correct the targeted linguistic errors via The Graduated Written CF Strategies. The effectiveness of the scaffolded written CF

was tested immediately in the revision of a written text (W3) which had been completed two weeks prior and in a new written text (W4) after ten weeks' time.

6.3.6.1 Scaffolded written CF

The transcript of the scaffolding revealed that the majority of the targeted linguistic errors were identified and corrected by each of the participants with the minimum amount of written CF assistance (their attention was drawn to the sentence in which an error occurred). There were a few errors which required more explicit written CF, and the most explicit written CF type needed was direct correction. However, there was no obvious pattern showing that the highly idiosyncratic and complex prepositions indicating space errors required more explicit written CF than the less rule-governed, idiosyncratic irregular past tense and the rule-based regular past tense errors. Instead, some regular past tense errors (e.g. *chated*) required more explicit written CF to be corrected, while the irregular past tense and prepositions indicating space errors could be corrected as soon as the participant's attention was drawn to the problematic sentences (e.g. *get* and *on the recliner*). Aljaafreh and Lantolf (1994) also reported that different levels of assistance were needed by different participants on different errors, including articles, tense markings, preposition and modal verbs.

In light of these findings, what written CF is needed and whether or not written CF is explicit enough may depend, to a large extent, on the learner's explicit knowledge and the extent to which it has been processed with conscious attention. When the learner has explicit knowledge that has been processed well, the least explicit written CF may be explicit enough to raise the learner's attention, so that he/she is able to retrieve the knowledge and produce the correct forms. If the declarative knowledge hasn't been proceduralized well, more explicit written CF may be needed because it may provide explicit guidance when the learner is searching for the relevant explicit knowledge. Furthermore, if the learner does not have the explicit knowledge, the most explicit written CF (direct correction and direct correction plus metalinguistic explanation) may be needed because the correct forms and metalinguistic explanation included in written CF may allow the learner to build up the explicit knowledge.

It was also found that there was no direct relation between the explicitness of written CF needed and the participant's proficiency level. As found in RQ5, the scaffolded written CF also revealed that proficiency level may only indicate the learner's general L2 knowledge and their ability to use it, but may not indicate whether or not and the extent to which the learner has the explicit knowledge relating to each specific linguistic instance.

Compared to the one session of written CF treatment in the main study, the scaffolded written CF was generally much less explicit. Most of the errors were corrected when the learner's attention was drawn to the sentences where the errors had occurred. This may be because the scaffolding engaged the learner better via the dialogical interaction, and thus a higher level of conscious attention was raised and deeper cognitive processing took place. The dialogical interaction also enabled the researcher to assess and provide written CF to suit the learner's needs. Both providing written CF within the learner's needs for each error and raising the higher level of attention may have ensured the full processing of the scaffolded written CF, which may be the great advantage of scaffolded written CF. The advantage of scaffolded written CF was also revealed by the participants' improved accuracy in the revision of another written text which had been completed six weeks prior in the main study.

6.3.6.2 The immediate effectiveness of scaffolded written CF

The immediate effectiveness of scaffolded written CF was tested in the revision of the written text (W3) which had been completed two weeks before the case study was conducted. After the provision of scaffolded written CF, all the regular past tense errors were corrected, while the irregular past tense and prepositions indicating space errors were corrected to various extents by each participant.

As has been discussed in Chapter 5, regular past tense forms were used on very few occasions. After the provision of scaffolded written CF on one or two regular past tense errors (usually the least explicit written CF assistance was needed), all the regular past tense errors were identified and corrected by the participants in the revision.

The majority of the errors which had received scaffolded written CF were irregular past tense errors (See the discussion in Chapter 5). After scaffolding, the participants corrected the irregular past tense errors to various extents. Two of the participants did not correct any of the irregular past tense errors in their revision and the similarity between the two cases was that very few irregular past tense errors had received scaffolded written CF. Mary required direct correction for *ride* during scaffolding and the errors that remained after revision were different instances (*was-were, has-had, set-sat*). Thus, although there was no improved accuracy in the revision, caution needs to be exercised in that the scaffolded written CF on *ride* was ineffective. The other learner, Shirley, required direct correction for *stand* and error code for *ride* during the scaffolding. Although she did not produce the correct forms for the two irregular past tense verbs in the revision, she did change *rade* into *rod*. Her attempt actually proved the effectiveness of scaffolded written CF on *ride*. It may be that she had just built up her explicit knowledge that the past tense form for *ride* is *rode* as a result of scaffolded written CF, and this limited processing hadn't enabled her to retrieve the knowledge correctly. This may explain why she changed the form of the error, but was not able to make it correct. For the other three cases, the participants corrected the errors to different extents and achieved improved accuracy. The similarity among these three cases is that a good number of errors had received scaffolded written CF. Therefore, it might be the case that the more instances which receive scaffolded written CF, the more likely that the irregular past tense will be used more accurately in subsequent writing. It is understandable because there is no general rule for the irregular past tense, and the explicit knowledge about each individual use of the irregular past tense has to be built up.

What also needs to be noted is that the irregular past tense has been taught at the early stage of English learning and some of the irregular past tense forms have been used more often than others. It has been noticed that the participants easily identified and corrected some often used instances (e.g., *was, were, got, could*); while they required more explicit written CF assistance on other instances (e.g., *rode, stood*). This may indicate that the participants have the explicit knowledge for some, but not for others. This may also indicate that some of the explicit knowledge has been proceduralized to a larger extent than other knowledge. Therefore, again,

whether or not and the extent to which written CF is needed and can facilitate improved accuracy in the immediate subsequent writing may depend very much on whether or not the learner has the explicit knowledge and the extent to which it has been processed with conscious attention.

Prepositions indicating space were also used on very few occasions. One of the participants, Mary, corrected the same error (*in-on their right*) which had received scaffolded written CF in the revision. This may strongly prove the immediate effectiveness of scaffolded written CF. Some other instances which hadn't received scaffolded written CF were also corrected by some of the participants. For example, Mary corrected *_the recliner* to *in the recliner*, and Shirley corrected *at the girl* to *beside the girl* and *_ the corner* to *on the corner*. That the participants were able to correct the errors which hadn't received scaffolded written CF may be because they had had the explicit knowledge of the use of these instances and the scaffolded written CF raised her attention regarding the use of prepositions indicating space. In other instances, the errors were not corrected, but this cannot prove the ineffectiveness of scaffolded written CF as they were different instances from the ones which had received scaffolded written CF. That they were not able to correct other instances which had not received scaffolded written CF like Mary, Shirley, may be because they hadn't had the explicit knowledge of the other instances or the explicit knowledge hadn't been processed enough to be retrieved accurately and fast.

To sum up, the immediate effectiveness of scaffolded written CF is clear. In the main study, these five case study participants' overall accuracy decreased in the immediate post-test after receiving one session of written CF treatment of various degrees of explicitness. However, immediately after receiving scaffolded written CF, not only did their overall accuracy increase, but also the accuracy of almost each linguistic type. The improved accuracy may have resulted from the dialogical interaction between the researcher and the participant which may have engaged each individual better and triggered deeper processing. Thus, they may have been able to retrieve the explicit knowledge correctly and produce the correct forms in the subsequent writing. The better engagement and deeper processing may also

have benefited the participants' use of other linguistic instances, which hadn't received scaffolded written CF. However, the extent to which scaffolded written CF can facilitate immediate improved accuracy may, to a large extent, depend on each learner's explicit knowledge of the specific instance, regardless of the complexity of the linguistic type (rule-based, less rule-governed, idiosyncratic, or highly idiosyncratic and complex).

6.3.6.3 The effectiveness of scaffolded written CF over 10 weeks' time

The results of the retention of the scaffolded written CF were interesting. All five participants were able to use the irregular past tense with higher accuracy than before the provision of scaffolded written CF. The exact same prepositions indicating space errors didn't occur in the long-term effect test. However, some of the regular past tense errors reoccurred (in Helen, Shirley and Anna's cases) after ten weeks, and it resulted in the decreased accuracy in the long-term effect test. Some of the reoccurring regular past tense errors shared the same rules with the ones which had received scaffolded written CF, and some didn't.

One possible explanation for the reoccurrence of the regular past tense errors is that very few regular past tense errors had received scaffolded written CF. Thus insufficient controlled processing had taken place, and thus knowledge consolidation did not occur. It is also true that prepositions indicating space errors were also few. What is different between prepositions indicating space and the regular past tense is that most of the regular past tense errors were corrected by the participants simply when their attention was drawn to the problematic sentences; while more explicit written CF assistance was required on prepositions indicating space errors. Therefore, it may indicate that learners had the explicit knowledge of the regular past tense but that insufficient attention had been paid to it. This may be because the learners thought they knew the rules for forming the regular past tense and were able to use them correctly.

Therefore, it may be concluded that written CF is very important even when the learners have the explicit knowledge because written CF can draw learners' attention and trigger the controlled processing of the explicit knowledge. In this case, the explicitness of written CF may not have a strong impact; instead, what is

more important may be the number of sessions of written CF. More sessions of written CF may trigger the controlled processing of explicit knowledge repeatedly, and thus may be more likely to enable the learners to consolidate their existing knowledge. More sessions of written CF may also benefit the less rule-governed, idiosyncratic linguistic types (irregular past tense and prepositions indicating space). This is because more instances would receive written CF, so it is more likely that the explicit knowledge of the specific instances could be developed and consolidated. However, when the learners do not have the explicit knowledge of the specific rules or instances, only highly explicit written CF (direct correction and direct correction plus metalinguistic explanation) may be beneficial as it may first enable the learners to build up their explicit knowledge.

It is important to refer to other scaffolded written CF studies before drawing any conclusions. However, unfortunately, no studies have examined the immediate and long-term effectiveness of scaffolded written CF to date. As has been mentioned before, scaffolded written CF research has been conducted within a socio-cultural framework. The effectiveness of scaffolded written CF has been measured by a systematic reduction in the level of assistance needed by the learner over time. It was found in Aljaafreh and Lantolf's study (1994) that less explicit written CF was needed after the provision of scaffolded written CF, but not in Erlam, Ellis, and Batstone's (2013) study.

Only one scaffolded written CF study looked at improved accuracy after the provision of scaffolded written CF. Nassaji and Swain (2000) reported that the student who received four sessions of scaffolded written CF showed a progressive trend in the accurate use of English articles, with 52% in her first composition and 95.2% in her last composition. One of the big differences between their study and the present one is that four scaffolding tutorials were provided, while only one session was provided in the present study. The other difference is that their study only focused on the simple rule-based English articles; while the present study investigated the effect of scaffolded written CF on three linguistic types which vary very much in complexity. These differences may explain why the findings on the long-term effectiveness in the current study were not as promising as theirs. If more

sessions of scaffolded written CF are provided, better long-term effectiveness may be found.

To conclude, the advantages of scaffolded written CF may lie in its capability to engage learners better in dialogical interaction. It may raise their higher level of attention and deeper cognitive processing, and thus may result in optimal L2 development. However, only one session of scaffolded written CF may not greatly contribute to improved accuracy over time. The degree of explicitness of written CF may not be the key factor for its facilitative role in improving accuracy; instead, more sessions of written CF of a low degree of explicitness may result in better improved accuracy in subsequent writing tasks when learners have the explicit knowledge. However, when learners do not have the explicit knowledge, highly explicit written CF (e.g. direct correction and direct correction plus metalinguistic explanation) may first enable them to build up their explicit knowledge, so that improved accuracy after more sessions of written CF may be expected.

CHAPTER 7

CONCLUSION

7.1 Introduction

In this chapter, the findings from Chapter 5 and Chapter 6 are discussed further in relation to their significance regarding contributions to theory, research, and pedagogy. The central aims of this thesis and how these aims were achieved are recounted first in Section 7.2, and then follows a detailed summary of the findings from each of the research questions. Section 7.3 presents the contributions of this thesis, starting with the contributions to theory, followed by the contributions to research and pedagogy. Section 7.4 discusses the limitations of this thesis and section 7.5 provides recommendations for future research. This chapter concludes with some final remarks in section 7.6.

7.2 Summary of findings

The aims of this study were to explore the effectiveness of written CF of different degrees of explicitness on three different linguistic error types. Besides examining the moderating role of the degree of explicitness of written CF and linguistic error type, learner's proficiency level was examined as another potential moderating factor on the effectiveness of written CF. In addition to the investigation of the effectiveness of written CF on a group's improved accuracy, this study also explored individual's responses to written CF with the aim of finding out whether or not and why written CF was not beneficial for some learners.

The data were collected in a university in China. The participants were first year students not majoring in English. Furthermore, they were classified as pre-intermediate level English learners. A quasi-experimental study was conducted first with the participants being divided into six groups (underlining group, error code group, metalinguistic explanation group, direct correction group, direct correction plus metalinguistic explanation group, and control group). With the aim of examining the effectiveness of one session of written CF of various degrees of explicitness on three linguistic error types (regular past tense, irregular past tense

and prepositions indicating space) and the potentially moderating role of learner's proficiency level, a pre-test, immediate post-test and two delayed post-tests were assigned. This quantitative study was designed to answer research questions 1-4.

Besides, one participant from each written CF group whose overall accuracy had not increased immediately after receiving written CF was invited to participate in the follow-up case study. Each participant's individual use of the three targeted linguistic types in the pre-test and the immediate post-test was analysed in-depth with the aim of finding evidence or counterevidence for the failure of one session of written CF on each error. They were also asked to correct the errors in the pre-test piece of writing using the written CF provided in the main study. If the participant had difficulty correcting the errors, the researcher provided another more explicit type of written CF, and this continued until the participant corrected the errors or had no difficulty understanding the correct forms provided by the researcher. The aim of doing this was to determine whether or not the reason they had not been able to improve their accuracy of the targeted linguistic types was because the written CF they had received was not explicit enough. Scaffolded written CF was then provided and its immediate and long-term effectiveness was tested with the aim of finding out whether or not the provision of scaffolded written CF resulted in better improved accuracy over time. The case study was designed to answer Research Questions 5 and 6.

RQ1: Does written CF enable Chinese EFL learners to use targeted linguistic types more accurately in new writing tasks over a period of four months?

The accuracy rates before and after one session of written CF were measured, and each of the written CF groups was compared to the control group on four testing occasions. It was found that one session of more explicit types of written CF (metalinguistic explanation, direct correction, and direct correction plus metalinguistic explanation) enabled the learners to use the targeted linguistic types (regular and irregular past tense and prepositions indicating space were regarded as a group) more accurately in the immediate post-test, but this was not the case for less explicit types of written CF (underlining and error code). However, the

effectiveness of these three more explicit types of written CF was not retained over a four-month period.

RQ2: Is the effectiveness of written CF dependent upon its degree of explicitness (underlining, error code, metalinguistic explanation, direct correction, direct correction plus metalinguistic explanation)?

Since only more explicit types of written CF (metalinguistic explanation, direct correction, and direct correction plus metalinguistic explanation) were found to be effective in facilitating improved accuracy in the immediate post-test, whether or not these three written CF types resulted in improved accuracy to different extents was then tested. No differential effectiveness was found between these three types of written CF. It may indicate that for the learners in the study, one session of metalinguistic written CF was explicit enough for them to either form a new, correct hypothesis or retrieve their explicit knowledge correctly in the immediate post-test, and that written CF of a higher degree of explicitness was not needed.

RQ3: Is written CF more effective in targeting certain linguistic errors (regular past tense, irregular past tense and prepositions indicating space)?

In the first two research questions, the effectiveness of written CF on treating the three linguistic error types as a group was investigated. However, they are very different in nature. Regular past tense is rule-based and irregular past tense is less rule-governed and more idiosyncratic. Prepositions indicating space are idiosyncratic and very complex because their correct use is very much dependent on the specific linguistic context. Thus, RQ3 investigated whether or not these various linguistic types benefitted differently from written CF of various degrees of explicitness. It was found that one session of written CF, irrespective of its degree of explicitness, did not facilitate the improved accuracy of regular past tense or prepositions indicating space immediately or over time. When irregular past tense was investigated alone, it was found that one session of direct correction enabled the learners to use irregular past tense with improved accuracy immediately. However, the effectiveness of direct correction was not retained over a four-month period.

RQ4: Does the proficiency level (higher and lower) of Chinese EFL learners determine how effective written CF is for improving the accuracy of (a) regular past tense, (b) irregular past tense and (c) prepositions indicating space in new writing tasks over a period of four months?

Besides error type, the other possible moderating factor examined in this study was the learner's proficiency level. Although in general all students in the study were regarded as pre-intermediate students, there were noticeable differences in their scores in the National Matriculation English test (The highest score is 131 and the lowest is 63), which indicated that there may in fact be differences in their proficiency level. Therefore, the students were grouped into higher (Mean = 111.07) and lower (Mean = 90) proficiency groups and their accurate use of each targeted linguistic type after their written CF treatment was examined. However, learner's proficiency level was not found to moderate the effect of written CF on each of the linguistic error types.

RQ5: To what extent does no accuracy improvement in the immediate post-test mean that one session of written CF treatment has been not beneficial for Chinese EFL learners?

In spite of the findings of the quantitative study, the qualitative examination of the five case studies provided insight into the effect of written CF and the moderating factors including the degree of explicitness of written CF, error type and learner's proficiency level. Each of the five participants' immediate post-test pieces of writing was analysed in-depth and no written CF type was found to have been completely ineffective in treating any of the error types, although it was found that more explicit types of written CF (direct correction, direct correction plus metalinguistic explanation) were more likely to be explicit enough for the learners to produce the correct forms, especially for the learners with a lower proficiency level. No correlation was found between the complexity of the error type and the explicitness of the written CF needed. Instead, it was found that the very complex prepositions indicating space errors needed less explicit types of written CF than some of the regular and irregular past tense errors, while the rule-based regular past tense errors required more explicit types of written CF in some instances. For

example, one of the learners corrected *on the armchair* to *in the armchair* only with *on* underlined; while *stay* was not able to be corrected by another until the correct form *stayed* was provided (see Chapter 6 for details).

RQ6: To what extent does the provision of scaffolded written CF facilitate improved accuracy for Chinese EFL learners who failed to benefit from a single written CF treatment?

In the case study, each participant was also scaffolded to correct the targeted linguistic errors in the delayed post-test 1 piece of writing, and then the effectiveness of scaffolded written CF was tested immediately and over time. On the one hand, it was found that the dialogical interaction between the individual learner and the researcher enabled the participants to correct most of the errors with the minimum amount of written CF assistance (often the learner's attention was drawn to the sentence in which an error had occurred). Moreover, no correlation was found between the complexity of the linguistic type and the explicitness of the written CF needed. Also, there was no direct relationship between the learner's proficiency level and the explicitness of the written CF needed. Instead, how explicit written CF needed to be was determined by each individual error regardless of the linguistic error type.

On the other hand, very clear evidence of the immediate effectiveness of scaffolded written CF was found. The regular past tense errors were corrected to a large extent, followed by the irregular past tense and prepositions indicating space errors. However, after ten weeks, some regular and irregular past tense errors reoccurred, but the prepositions indicating space errors did not. It may mean that the effectiveness of scaffolded written CF was better retained for prepositions indicating space than for irregular and regular past tense errors.

7.3 Contributions of this study

This section discusses the contributions of this thesis. It starts with a discussion of the contributions to theory, and then goes on to discuss the contributions to research and pedagogy.

7.3.1 Contributions to theory

This section presents the contributions of this study to existing cognitive theories. An information processing account explains that L2 learning starts from the development of explicit knowledge through the processing of noticed input. After that, repeatedly controlled processing with conscious attention is needed before L2 knowledge can be used accurately and fast (knowledge consolidation). In an interactionist account, the interaction between the learner and the teacher can be seen as the key factor for successful information processing because interaction may not only engage the learner better in the cognitive processing, but also ensure the input provided meets the learner's current needs. Thus, this section starts by discussing the contributions of this study to an understanding of the key factors in both the development of explicit knowledge and the repeated processing of it. It then discusses the contributions of the study to an understanding of the value of interaction for information processing.

7.3.1.1 Key factors in the development of explicit knowledge

In chapter two, it has been explained, with reference to Gass' (1997) Computational Model, that a single episode of input processing starts if written CF input is noticed. If the noticed written CF can be comprehended, and then matched against the learner's existing knowledge, his/her hypotheses about some grammatical forms may be rejected and new hypotheses may be formed. This way, explicit knowledge is developed even though the new hypotheses may not be correct.

Gass (1997) explains that in order to benefit from written CF input, the learner first needs to apperceive it. That is, the learner realizes/notices that written CF is related to some aspect of his/her existing knowledge. Drawing upon Tomlin and Villa's (1994) work, Schmidt (1990, 1994, 2001) distinguished three levels of attention and claimed that only when the highest level of attention (*detection*) is raised, written CF can be processed further. Therefore, the degree of explicitness of written CF may be an essential factor for its effectiveness. More explicit types of written CF, such as metalinguistic explanation, direct correction and direct correction plus metalinguistic explanation, may be more likely to draw the highest level of attention of a learner because the relevant linguistic information is explicitly or clearly stated

in them, and, as a result, they are more likely to be processed further. With the highest level of attention and the additional linguistic information, more explicit types of written CF may be more likely to lead to a new, correct hypothesis and thus may result in accurate output. That is, more explicit types of written CF are more likely to lead to immediate improved accuracy than the less explicit types of written CF. The findings of RQ1 did reveal that only more explicit types of written CF led to improved accuracy in the immediate post-test. However, the findings of RQ3 showed that only direct correction enabled the learners to use irregular past tense more accurately in the immediate post-test. Even the most explicit type of written CF (direct correction plus metalinguistic explanation) was not found to be helpful in improving the accurate use of regular past tense and prepositions indicating space. These findings may mean that the degree of explicitness of written CF is not the only determining factor impacting written CF effectiveness. Instead, a learner's existing knowledge may play an important role in whether or not written CF can lead to improved accuracy.

Firstly, learner's existing knowledge may determine whether or not a certain type of written CF is explicit enough to be noticed, attended to and processed to the next stage. When the learner has the existing knowledge relevant to the information offered by written CF, a less explicit type of written CF may raise his/her highest level of attention to further process it. However, when the learner does not have such existing knowledge, even the most explicit type of written CF may not raise the learner's highest level of attention and thus written CF may not be processed to the next stage. For example, when *stoped* is underlined, the learner who has some existing knowledge about the rules of the regular past tense may be able to realize it is a regular past tense error. However, if the learner does not have that knowledge already, underling may not be explicit enough for the learner to understand what the problem is with *stoped*.

A learner's existing knowledge may be even more important at the stage of intake because the information offered by written CF is matched against the learner's existing knowledge (Gass, 1997). Therefore, even when written CF is noticed and comprehended, written CF may not be able to contribute to the forming of a new,

correct hypothesis if the learner does not have the relevant existing knowledge. For example, the learner understands that *stoped* is not the correct past tense form for *stop*. However, if he/she does not know that for some verbs, the last consonant needs to be doubled before adding *-ed*, the learner may not be able to produce the correct form. Therefore, whether or not written CF can lead to improved accuracy may depend more on the learner's existing knowledge than the degree of explicitness of written CF. Thus, the degree of explicitness required is determined by the learner's existing knowledge and thus may vary for different learners learning from different errors. Consequently, the findings of this study advance existing theory with respect to (1) emphasizing the important role of existing knowledge alone in forming a new, correct hypothesis, thus directly contributing to L2 development, and (2) suggesting the determining role of existing knowledge on learners' attention, thus contributing to L2 development indirectly.

The findings of the multiple case study (RQ5 and RQ6) provided further evidence that the degree of explicitness of written CF required is not isolated, because it is influenced by a number of other factors. The degree of explicitness of written CF required by each individual may differ and be determined by each individual's existing knowledge. It was reported in the case study that some correct forms were produced by the learner after only receiving the least explicit type of written CF (underlining); while for some other errors, the learner required the researcher to provide direct correction. Furthermore, the degree of explicitness of written CF did not show a direct relation to linguistic error type or a learner's proficiency level, for example, rules-based errors benefitted more from less explicit types of written CF, or higher proficiency learners required less explicit types of written CF. Instead, the degree of explicitness of written CF was only related to the specific error. For example, some higher proficiency learners needed more explicit types of written CF on simple rule-based regular past tense errors; while some lower proficiency learners needed less explicit types of written CF on very complex prepositions indicating space. These findings may indicate that the effectiveness of written CF is not dependent on the learner's existing knowledge of any broad linguistic category (for example, regular past tense and irregular past tense). Instead, it may

be determined by whether the learner has the existing knowledge related to the specific information offered by the written CF.

To sum up, input-processing theory has put an emphasis on the role of attention in regards to the extent to which input can be processed and benefit the development of explicit knowledge. Gass (1997) has also mentioned the role of existing knowledge in noticing input and forming a new hypothesis because, firstly, the noticing of the input depends on a learner's existing knowledge. Secondly, even when the input is successfully apperceived and comprehended, without the related existing knowledge, the learner may not be able to match the comprehended input with the existing knowledge and form a new, correct hypothesis. Thus, the input may not be processed to the final stage and result in accurate output. However, Gass (1997) has just referred to existing knowledge as existing internalized grammatical rules, but what kind of grammatical rules would benefit input processing, the broad rules of any linguistic category or the specific use of any linguistic instance, has not been explained specifically and explicitly.

Therefore, the contributions of this study to theory may be that a learner's existing knowledge needs to receive more emphasis and be regarded as the essential factor for a successful episode of input processing instead of attention. More importantly, it may need to be added into input-processing theory that the existing knowledge refers to the learner's existing knowledge related to the specific information offered by the input, instead of his/her broad existing knowledge.

7.3.1.2 Key factors in the controlled processing of explicit knowledge

After explicit knowledge is developed, it may not be retrieved correctly if insufficient attention to the form is involved. As explained in the skill acquisition theories, explicit knowledge needs to be processed with conscious attention repeatedly (McLaughlin, 1987, 1990), or declarative knowledge needs to be proceduralized (Anderson, 1983, 2000) before it can be used accurately and fast. The findings of the quantitative study showed the immediate improved accuracy of the targeted linguistic forms after one session of more explicit types of written CF (metalinguistic explanation, direct correction, and direct correction plus metalinguistic explanation). This may indicate that the more explicit types of

written CF enabled the learners to form a new, correct hypothesis regarding the correct use of the targeted error. It may also indicate that these more explicit types of written CF raised more of the learners' conscious attention and thus they were able to retrieve their explicit knowledge more effectively. However, improved accuracy was not retained over a four-month period. One possible explanation may be that one session of more explicit written CF had just enabled the learners to form a new, correct hypothesis and the newly built-up explicit knowledge had not been processed sufficiently in a controlled manner with conscious attention. Thus, the explicit knowledge was not able to be retrieved correctly when the learners' attention was on both meaning and form when they were doing a writing task four months later. The other possible explanation may be that one session of more explicit types of written CF had enabled the learners to process the explicit knowledge with sufficient attention once, but it didn't result in the consolidation of explicit knowledge. Therefore, in another piece of writing after four months' time, the learners were not able to retrieve the explicit knowledge correctly when their attention was on both meaning and form. Both cases may mean that one session of written CF was not sufficient for knowledge consolidation and that additional sessions of written CF may be needed to enable the learners to consolidate their explicit knowledge and improve their accuracy over time.

The students in the case study showed improved accuracy immediately after receiving scaffolded written CF, but some of the errors reoccurred after ten weeks. These reoccurring errors included the regular past tense instances which need *-ed* to be directly added to the infinitive verb and irregular past tense instances which are often used, for example, *is-was and are-were*. The reoccurring errors were easily identified and corrected by the learners without any assistance from the researcher, which may suggest the learners had already stored the explicit knowledge in their LTM. However, the reoccurrence of simple errors over time may indicate that the explicit knowledge of these simple linguistic instances hadn't been processed sufficiently. Also, it may indicate that insufficient attention was paid to these forms when they were writing new texts and the learners may not even have referred to their explicit knowledge.

Therefore, even though written CF may have raised the learners' conscious attention on the three linguistic error types, they may not have been able to pay sufficient attention to processing the explicit knowledge about all of linguistic error types at the same time because the working memory where the processing occurs is of limited capacity. However, it has been discussed that attention is another essential component of cognition besides working memory. Another characteristic of working memory is temporary activation, and attention can heighten the activation level of the explicit knowledge, allowing it to remain there for further processing and thus making it available to enter the long-term memory (Ortega, 2009).

In the skill acquisition theories (Anderson, 1983, 2000; McLaughlin, 1987, 1990), *practice* (the controlled processing or the proceduralization of the declarative knowledge) has been the key word. This study has suggested that conscious attention may be the key factor for successful practice, which can contribute to knowledge consolidation. Besides, because of being limited, attention is selective and, thus, only one attention-demanding processing task can occur at a time. Attention is also voluntary, which means it is determined by the goals and intentions of the individual (Ortega, 2009). Therefore, the amount of attention a learner can give to controlled processing may be determined by the amount of explicit knowledge, the extent to which it demands attention, and also the learner's intentions. Thus the contributions of this study are, on the one hand, suggesting more importance be placed on attention in successful controlled processing; on the other hand, the study draws attention to factors which may determine the amount of conscious attention involved, including the amount of explicit knowledge, whether it demands a large amount of attention, and an individual's intention.

7.3.1.3 The value of interaction on cognitive processing

Each participant in the case study was scaffolded to correct the targeted linguistic errors and it was found that on the one hand, participants needed only a limited amount of written CF assistance to correct most of the errors. On the other hand, the scaffolded written CF was found to result in immediate improved accuracy. This it may suggest the dialogical interaction was able to engage each participant better

in cognitive processing, so that the learner was able to achieve something which would be beyond his/her own capability (Wood et al., 1976). Furthermore, during the interaction, the researcher may also have been able to assess and provide written CF suitable to the learner's developmental stage. As a result, this may have enabled the learner to produce the correct forms with the minimum written CF assistance and use the targeted linguistic types with improved accuracy in the subsequent writing task.

However, the scaffolded written CF was not found to be an advantage when it came to long-term effectiveness. Improved accuracy was not retained after ten weeks. The findings suggest that scaffolded written CF may not lead to the consolidation of explicit knowledge, although it was shown to be very effective in the initial development of explicit knowledge. Therefore, the interaction between the individual learner and the researcher may allow the individual to have deeper cognitive processing of the negotiated input and facilitate the development of the explicit knowledge and the retrieval of explicit knowledge. However, interaction alone may not result in knowledge consolidation. Instead of interaction, the key factor for the consolidation of explicit knowledge may be the frequency of controlled processing rather than the explicitness of written CF. Therefore, any advantage of scaffolded written CF on immediate improved accuracy may not be the result of deeper cognitive processing and the sufficiently explicit written CF on each error. It may instead result from multiple episodes of processing of written CF. As has been explained in the Methodology chapter, during scaffolding, the learner's attention is first drawn to the problematic sentence in which an error has occurred, and when the learner is not able to identify the error, the researcher points out the segment in which the error lies. If the learner still cannot identify the error, the researcher may underline it. Therefore, each time written CF assistance is provided, an episode of processing may occur. This repeatedly triggered cognitive processing may have resulted in the learner being able to correct the errors with the least amount of written CF assistance and to also use the targeted linguistic types with improved accuracy in the immediate post-test.

Therefore, the findings of this study have confirmed the value of interaction in raising a higher level of attention and engaging learners in deeper cognitive processing. Thus, interaction may facilitate cognitive processing. However, attention is not an isolated factor; instead it is determined by other factors, for example, the learner's existing knowledge, and his/her intentions. Therefore, the findings of this study may suggest that interaction is not the key factor for successful information processing. Instead, successful information processing is dependent on a learner's existing knowledge at the stage of development of explicit knowledge; on the amount of explicit knowledge, the demands it places on attention and the learner's intentions at the stage of knowledge consolidation. Although interaction may facilitate cognitive processing, its value may be restricted by the cognitive developmental stage. Thus, interaction may facilitate the development of explicit knowledge and the controlled processing of explicit knowledge with sufficient conscious attention; however, it may not directly result in the consolidation of explicit knowledge because knowledge consolidation is determined by the frequency of controlled processing rather than the explicitness of input.

7.3.2 Contributions to research

The current study has broadened current investigations into the effectiveness of written CF for L2 development by testing all types of written CF in terms of their effectiveness on L2 development (from the least to the most explicit). This study has also examined possible moderating factors (error type and learner's proficiency level) on the effectiveness of written CF. Furthermore, the study has deepened our understanding of the effectiveness of written CF on L2 development by analysing individual's responses to written CF on each targeted linguistic error.

First of all, written CF was classified in detail and all the written CF types which had been studied previously in research and applied in classrooms were examined and compared in this study. In early studies, written CF was simply divided into direct and indirect (Chandler, 2003; Kepner, 1991; Semke, 1984; Sheppard, 1992), but indirect written CF was operationalized differently, including underlining, circling or error code. In recent studies, written CF was categorized further, but the terms for and the definitions of written CF types varied. For example, Sheen (2007a,

2011) used *direct metalinguistic written CF* in her studies, which actually means direct correction plus metalinguistic explanation. Ellis (2009) defined error correction as a form of metalinguistic explanation, while it was considered as an indirect written CF type in Semke's (1984) study. In the most recent studies, although written CF was further classified, either direct correction was compared to more explicit types of written CF, for example, direct plus metalinguistic explanation (Bitchener, 2008; Bitchener & Knoch, 2008, 2009a, 2010a; Bitchener et al., 2005; Sheen, 2007a), or direct correction was compared to less explicit types of written CF (e.g. underlining, metalinguistic explanation) (Bitchener & Knoch, 2010b; Shintani & Ellis, 2013; Shintani et al., 2014) (details see Section 3.3). Written CF of all the various degrees of explicitness has previously never been investigated within a single research design and this may be because previous studies have taken an ecological rather than an experimental approach. A wide range of written CF options of various degrees of explicitness were examined in a single study in this thesis. Thus, the relationship between the degree of explicitness of written CF and its effectiveness may be better understood.

The current study also advanced our understanding of the effectiveness of written CF on more linguistic categories, especially the ones of different nature, including rule-based regular past tense, less rule-governed, idiosyncratic irregular past tense and very complex and idiosyncratic prepositions indicating space. The majority of the focused written CF studies have confirmed the facilitative role of written CF on the development of English articles (Bitchener, 2008; Bitchener & Knoch, 2008, 2009a, 2009b, 2010a, 2010b; Sheen, 2007a); and a few studies have attempted to examine the effect of written CF on other linguistic error types and sentence structures (for example, past tense, articles and prepositions in Bitchener et al.'s (2005) study and the hypothetical conditional in Shintani et al.'s (2014) study). Bitchener et al. (2005) investigated the effect of written CF on English articles, past simple tense and prepositions. This study also investigated the effect of written CF on past tense and prepositions. What is different from Bitchener et al.'s (2005) study is that regular past tense and irregular past tense were investigated separately in this study because regular past tense and irregular past tense are very different in nature. Besides, only one type of prepositions - prepositions indicating space was looked

at in this study because prepositions indicating space, movement and time differ in complexity and functional use. Regular past tense is more rule-based, whereas the irregular past tense is less rule-based and therefore more idiosyncratic. Prepositions indicating time, space and movement also vary in complexity. For example, the category of prepositions indicating time is more rule-based, but the category of prepositions indicating space is idiosyncratic and very complex because their correct use depends very much on the linguistic context. For example, *Meet me at the office* but *She is in her office*. Because of the very different natures of these three linguistic error types, this study was able to investigate the relationship between the degree of explicitness of written CF and error type. The study found that more explicit types of written CF (metalinguistic explanation, direct correction, and direct correction plus metalinguistic explanation) facilitated improved accuracy immediately when the three error types were considered as a group, but that only direct correction facilitated the improved accuracy of irregular past tense. These findings have added that not only the simple rule-based English articles, more explicit types of written CF could also facilitate the development of other linguistic categories, especially less rule-governed and idiosyncratic irregular past tense.

A further contribution of this current study is that for the first time proficiency level was investigated as a potentially moderating factor. The potential effect of different individual (Sheen, 2007a, 2007b, 2011) and contextual factors (Bitchener & Knoch, 2008) have started to be investigated. However, to date learner's proficiency level has not been investigated as a moderating factor on the effectiveness of written CF. According to cognitive information processing theories, a learner's existing knowledge plays a very important role both in the development of explicit knowledge and in its consolidation. A learner's proficiency has been investigated because it may predict a learner's existing knowledge to some extent. However, no significant difference was found for the moderating role of proficiency level. It may be because the participants were from a similar instruction context and had had a similar learning experience. Although there were noticeable differences in their scores in the National Matriculation English scores, the differences may not have been big enough to result in significant differences. Besides, it is one test and it is very likely that the score does not tell the student's real proficiency level. The

current study was just a start to investigate the moderating role of existing knowledge and has shed light on its potential impact on the effect of written CF as the case studies have shown that initially higher proficiency learners needed less explicit written CF assistance.

The quantitative study has contributed to written CF research regarding a range of written CF types, linguistic error types and the moderating effect of proficiency level. However, the most novel contribution may come from the multiple case study, which was carried out to explore whether or not written CF is ineffective if some individuals fail to produce improved written accuracy after one treatment. During the case studies, a qualitative exploration of how each individual used each targeted linguistic instance was conducted and scaffolded written CF was provided to investigate the extent to which the individual could benefit.

The case studies have provided insights into the effectiveness of written CF on L2 development by looking at individual's response to written CF on each linguistic error. First, the explicitness of written CF needed by each individual may be instance-specific, instead of linguistic type-specific. Second, the one-time provision of scaffolded written CF may not lead to knowledge consolidation, but additional sessions of scaffolded written CF may do. The qualitative study of investigating why some individuals' accuracy did not improve after receiving written CF based on the quantitative study may be the biggest contribution to written CF research. The quantitative study provided evidence of the effectiveness of written CF based on improved accuracy, while the qualitative study not only provided further evidence on the effectiveness of written CF, but also provided insights into why written CF was effective for an individual correcting some errors but not for another correcting other errors. Different to prior case studies which only looked at whether less written CF assistance was needed after scaffolding, this multiple case study also examined the short-term and long-term effectiveness of scaffolded written CF. Therefore, this study was able to present a more complete picture of the effectiveness of written CF on L2 development in this regard.

7.3.3 Pedagogical implications

The findings of the current study may encourage teachers to provide written CF on their students' writing. More importantly, the findings of this study may provide guidance for them to provide effective written CF to facilitate students' L2 development.

From the study, teachers may feel confident to provide more explicit types of written CF, for example, metalinguistic explanation, direct correction and direct correction plus metalinguistic explanation, on students' past simple tense and prepositions indicating space errors because clear immediate effectiveness was reported in this study. However, teachers may need to keep providing written CF over a number of sessions instead of just once because this study reported that one session of written CF did not result in improved accuracy over time and suggested a number of sessions may do so. The case studies reported that learners have explicit knowledge of specific instances to different extents. Thus, written CF of different degrees of explicitness may be needed on different errors. Therefore, scaffolded written CF may ensure that the written CF assistance provided is explicit enough on each error for each individual.

However, facing a big class, teachers would never be able to afford the time and energy to provide scaffolded written CF for each student. Thus, the teacher may find it useful to first provide less explicit types of written CF, for example underlining, to the entire class. Thus, the students may have the opportunity to search for their relevant existing knowledge in the LTM. Consequently, some students may form a new hypothesis and some may retrieve the explicit knowledge with conscious attention. Because it is likely that some students may not have the relevant existing knowledge and thus may not be able to form a new hypothesis as a result of underlining, the teacher then may arrange a mini class. During the class, the teacher may ask the students to review the written CF and correct the errors, allowing them to ask for further assistance if they have difficulty in correcting the errors. When one of the students asks for another more explicit type of written CF on a specific error, the teacher could then provide it to the entire class. The benefits of doing so are three-fold. First of all, it is a common phenomenon that students put

aside the writing without looking at the written CF, and thus a mini class may ensure the students attend to the written CF. Secondly, the teacher provides scaffolded written CF to individual's need but makes it accessible to all the students, which can benefit more students who have the same need. Thirdly, scaffolding is available to all the students, and they can choose when to mentally leave the scaffolding. If the written CF type has just met a student's current need, he/she can mentally leave the scaffolding. If not, he/she can stay mentally engaged in the scaffolding until his/her need is met. This technique can fulfil the interaction between teacher and the students, involve students in deeper cognitive processing, but avoid consuming too much of the teacher's time and energy.

Furthermore, as has been discussed in Section 7.3.1, a learner's working memory and attention are limited. Therefore, teachers may need to target a few linguistic error types in each written CF session. Furthermore, after a number of sessions of written CF, and when the targeted errors decrease, teachers could move on to focus on some other linguistic error types.

7.4 Limitations of the study

While the study has provided a deeper understanding of the effectiveness of written CF and the potentially moderating effect of various factors, there are several limitations.

The first issue concerns the sample size and the obligatory occasions of the targeted linguistic types. One hundred eighty one students from the same department were recruited initially. However, as thirty four of them did not complete all four writing tasks, their data were excluded. Compared to existing studies, the current study still had quite a large number of participants (147 participants in the quasi-experimental study), but because five written CF types were investigated and the study included a control group, only 23-27 participants were available in each group. Additionally, because of the nature of the writing tasks themselves, a very small number of regular past tense and prepositions indicating space instances were used in each written text. These two factors may explain why no between-group differences were found when regular past tense and prepositions indicating space were looked at separately.

Another limitation is the division of proficiency level. The participants were divided into higher and lower proficiency groups according to their English scores in the National Matriculation English test. It is a very prestigious examination in China and there were observable differences in their English scores. However, all the participants had had similar experience in English learning and although there may have been a difference in the quality and achievement of English learning, their proficiency levels may not have been different enough to result in a significant difference. Studies in which participants with very different proficiency levels are recruited may be able to find the moderating role of proficiency level on the effectiveness of written CF.

A further limitation concerns the generalizability of the findings of the study. It is important to note that the participants of the study came from a specific context (first year non-English majors in a second-level university in a small city in China), which means that the findings cannot be generalized to other learners who come from even slightly different contexts. The learners from a different context may have different proficiency levels, acquire past simple tense and prepositions indicating space to different levels, and thus the effectiveness of written CF may differ and the degree of explicitness of written CF needed may also differ.

7.5 Recommendations for future research

According to the limitations of the study, the first recommendation for future research is to recruit a larger number of participants. In this way sufficient obligatory occasions of the targeted linguistic types may occur, and thus statistical significance may be revealed.

Secondly, learner's proficiency level is worth investigating as it indicated a learner's existing knowledge which is one of the key factor for information processing. However, how to distinguish proficiency levels needs to be considered carefully. Proficiency is used to refer to learners' knowledge of and ability to use the targeted language. It may refer to a learner's overall ability in L2, and may also refer to specific aspects of L2, for example, grammar proficiency or pragmatic proficiency. It can also refer to the ability to use a specific linguistic feature, such as past tense (Loewen & Reinders, 2011). However, proficiency is often determined

as the class level in SLA literature, for example, beginner, intermediate. As pointed out by Loewen and Reinders (2011), proficiency levels used this way are fairly blunt and it is possible for learners to have differing L2 ability. Therefore, future research may need to find a valid measurement for the learners' proficiency levels. This way, the correlation between the effect of written CF and learner's proficiency level may be revealed.

Thirdly, since generalizability is one of the limitations, the findings regarding the effectiveness of more explicit types of written CF on past simple tense and prepositions indicating space need to be confirmed with other learners with different contextual and individual differences. For example, whether or not these linguistic categories are equally treatable for EFL and ESL students. And whether or not they benefit from written CF of the same degree of explicitness.

The case studies have provided an in-depth understanding of the effectiveness of written CF and revealed that negotiation between the individual and the teacher may facilitate information processing. Future research would do well to explore further the interaction between the learner and the teacher as it has been emphasized in SLA that the process of learning, including language learning, is socially mediated. Thus, social aspects need to be considered when investigating cognitive processes (Atkinson, 2002). Furthermore, only a few written CF studies have been conducted within the sociocultural framework and looked at the learner's need for less explicit written CF as an indicator of the effectiveness of written/oral CF (Aljaafreh & Lantolf, 1994; Erlam et al., 2013; Nassaji & Swain, 2000). Therefore, future written CF research may explore the impact of further social factors on the cognitive processing of written CF and measure the effectiveness of written CF in various aspects to explore the effectiveness of written CF and the process of language acquisition fully.

7.6 Final remarks

The effectiveness of written CF on L2 development has been underexplored. The findings of this study have confirmed the effectiveness of written CF on L2 development, shown its effectiveness on additional linguistic categories, especially on idiosyncratic features. The findings of this study have also suggested that

learner's existing knowledge may play a more important role than that has been claimed in existing information processing theory. Thus, the effectiveness of written CF may depend on each individual's existing knowledge which is closely related to the information offered in written CF.

The advantages of more explicit types of written CF have been confirmed on more linguistic categories of various natures in this study, the potential role of less explicit types of written CF and learner's proficiency level has also been initially revealed. It is hoped that future research will further investigate the effect of written CF on L2 development and examine more potentially moderating factors by looking at both group's performance and individual's response after receiving written CF.

REFERENCES

- Aljaafreh, A., & Lantolf, J. P. (1994). Negative feedback as regulation and second language learning in the zone of proximal development. *The Modern Language Journal*, 78(4), 465-483. doi:10.1111/j.1540-4781.1994.tb02064.x
- Anderson, J. R. (1976). *Language, memory, and thought*. Hillsdale, NJ: Lawrence Erlbaum.
- Anderson, J. R. (1983). *The architecture of cognition*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Anderson, J. R. (2000). *Cognitive psychology and its implications* (5th ed.). New York, NY: Worth Publishers.
- Anderson, J. R. (2014). *Rules of the mind*. Retrieved from <http://aut.summon.serialssolutions.com>
- Ashwell, T. (2000). Patterns of teacher response to student writing in a multiple-draft composition classroom: Is content feedback followed by form feedback the best method? *Journal of Second Language Writing*, 9(3), 227-257. doi:10.1016/S1060-3743(00)00027-8
- Atkinson, D. (2002). Toward a sociocognitive approach to second language acquisition. *The Modern Language Journal*, 86(4), 525-545.
- Bitchener, J. (2008). Evidence in support of written corrective feedback. *Journal of Second Language Writing*, 17(2), 102-118. doi:10.1016/j.jslw.2007.11.004
- Bitchener, J., & Ferris, D. (2011). *Written Corrective Feedback in Second Language Acquisition and Writing*. New York, NY: Routledge.
- Bitchener, J., & Knoch, U. (2008). The value of written corrective feedback for migrant and international students. *Language Teaching Research*, 12(3), 409-431. doi:10.1177/1362168808089924
- Bitchener, J., & Knoch, U. (2009a). The relative effectiveness of different types of direct written corrective feedback. *System*, 37(2), 322-329. doi:10.1016/j.system.2008.12.006
- Bitchener, J., & Knoch, U. (2009b). The value of a focused approach to written corrective feedback. *ELT Journal*, 63(3), 204-211. doi:10.1093/elt/ccn043
- Bitchener, J., & Knoch, U. (2010a). The Contribution of Written Corrective Feedback to Language Development: A Ten Month Investigation. *Applied Linguistics*, 31(2), 193-214. doi:10.1093/applin/amp016
- Bitchener, J., & Knoch, U. (2010b). Raising the linguistic accuracy level of advanced L2 writers with written corrective feedback. *Journal of Second Language Writing*, 19(4), 207-217. doi:10.1016/j.jslw.2010.10.002
- Bitchener, J., Young, S., & Cameron, D. (2005). The effect of different types of corrective feedback on ESL student writing. *Journal of Second Language Writing*, 14(3), 191-205. doi:10.1016/j.jslw.2005.08.001
- Celce-Murcia, M., Larsen-Freeman, D., & Williams, H. A. (1999). *The grammar book: An ESL/EFL teacher's course* (2nd ed.). Boston, UK: Heinle & Heinle.

- Chandler, J. (2003). The efficacy of various kinds of error feedback for improvement in the accuracy and fluency of L2 student writing. *Journal of Second Language Writing*, 12(3), 267-296. doi:10.1016/S1060-3743(03)00038-9
- Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches* (2nd ed.). Thousand oaks, CA: Sage Publications.
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Thousand oaks, CA: Sage Publications.
- Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into practice*, 39(3), 124-130. doi:10.1207/s15430421tip3903_2
- DeKeyser, R. (1998). Beyond focus on form: Cognitive perspectives on learning and practicing second language grammar. In C. Doughty & M. H. Long (Eds.), *Focus on form in classroom second language acquisition* (pp. 42-63). New York, NY
- DeKeyser, R. (2003). Implicit and explicit learning. In C. Doughty & M. H. Long (Eds.), *The hand book of Second language Acquisition* (pp. 313-348). Oxford, UK: Blackwell publishing.
- DeKeyser, R. (2007). *Practice in a second language: Perspectives from applied linguistics and cognitive psychology*. New York, NY: Cambridge University Press.
- Dörnyei, Z. (2005). *The psychology of the language learner*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Ellis, N. (2005). At the interface: Dynamic interactions of explicit and implicit language knowledge. *Studies in second language acquisition*, 27(02), 305-352. doi:10.1017/S027226310505014X
- Ellis, R. (2005a). Measuring implicit and explicit knowledge of a second language: A psychometric study. *Studies in second language acquisition*, 27(2), 141-172. doi:10.1017/S0272263105050096
- Ellis, R. (2005b). Principles of instructed language learning. *System*, 33(2), 209-224. doi:10.1016/j.system.2004.12.006
- Ellis, R. (2008). *The study of second language acquisition* (2nd ed.). Oxford, UK: Oxford University Press.
- Ellis, R. (2009). A typology of written corrective feedback types. *ELT Journal*, 63(2), 97-107. doi:10.1093/elt/ccn023
- Ellis, R., & Barkhuizen, G. (2005). *Analysing learner language*. Oxford, UK: Oxford University press.
- Ellis, R., Loewen, S., & Erlam, R. (2006). Implicit and explicit corrective feedback and the acquisition of L2 grammar. *Studies in second language acquisition*, 28(2), 339-368. doi:10.1017/S0272263106060141
- Ellis, R., Sheen, Y., Murakami, M., & Takashima, H. (2008). The effects of focused and unfocused written corrective feedback in an English as a foreign language context. *System*, 36(3), 353-371. doi:10.1016/j.system.2008.02.001
- Ely, M., Anzul, M., Friedman, T., Gardner, D., & Steinmetz, A. C. (1991). *Doing qualitative research: Circles within circles*. New York, NY: Falmer Press.
- Erlam, R., Ellis, R., & Batstone, R. (2013). Oral corrective feedback on L2 writing: Two approaches compared. *System*, 41(2), 257-268. doi:10.1016/j.system.2013.03.004

- Erlandson, D. A., Harris, E. L., Skipper, B. L., & Allen, S. D. (1993). *Doing naturalistic inquiry: A guide to methods*. Thousand oaks, CA: Sage Publications.
- Fathman, A. K., & Whalley, E. (1990). Teacher response to student writing: focus on form versus content. In B. Kroll (Ed.), *Second language writing*. Cambridge, UK: The Press Syndicate of the University of Cambridge
- Ferris, D. (1999). The case for grammar correction in L2 writing classes: A response to Truscott (1996). *Journal of Second Language Writing*, 8(1), 1-11. doi:10.1016/S1060-3743(99)80110-6
- Ferris, D. (2003). *Response to student writing: Implications for second language students*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Ferris, D. (2006). Does error feedback help student writers? New evidence on the short-and long-term effects of written error correction. In F. H. Ken Hyland (Ed.), *Feedback in second language writing: Contexts and issues* (pp. 81-104). New York, NY: Cambridge University Press.
- Ferris, D., & Roberts, B. (2001). Error feedback in L2 writing classes: How explicit does it need to be? *Journal of Second Language Writing*, 10(3), 161-184. doi:10.1016/S1060-3743(01)00039-X
- Frodesen, J., & Holten, C. (2003). Grammar and the ESL writing class. In B. Kroll (Ed.), *Exploring the dynamics of second language writing* (pp. 141-161). Cambridge, UK: The Press Syndicate of the University of Cambridge
- Gardner, R. C., & MacIntyre, P. D. (1993a). On the measurement of affective variables in second language learning. *Language Learning*, 43(2), 157-194. doi:10.1111/j.1467-1770.1992.tb00714.x
- Gardner, R. C., & MacIntyre, P. D. (1993b). A student's contributions to second-language learning. Part II: Affective variables. *Language Teaching*, 26(1), 1-11. doi:10.1017/S0261444800000045
- Gass, S. (1997). *Input, interaction, and the second language learner*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Glesne, C., & Peshkin, A. (1992). *Becoming qualitative researchers: An introduction*. White Plains, NY: Longman.
- Hedgcock, J. S., & Lefkowitz, N. (1994). Feedback on feedback: Assessing learner receptivity to teacher response in L2 composing. *Journal of Second Language Writing*, 3(2), 141-163. doi:10.1016/1060-3743(94)90012-4
- Housen, A., & Pierrard, M. (2005). Instructed second language acquisition: Introduction. In A. Housen & M. Pierrard (Eds.), *Investigations in instructed second language acquisition* (pp. 1-26). Berlin, Germany: Mouton deGruyter.
- Hyland, K. (2003). *Second language writing*. New York, NY: Cambridge University Press.
- Kepner, C. G. (1991). An experiment in the relationship of types of written feedback to the development of second-language writing skills. *Modern Language Journal*, 75(3), 305-313. doi:10.1111/j.1540-4781.1991.tb05359.x
- Krashen, S. D. (1985). *The input hypothesis: Issues and implications*. London, UK: Longman.

- Krashen, S. D. (1994). The input hypothesis and its rivals. In N. Ellis (Ed.), *Implicit and explicit learning of languages* (pp. 45-77). London, UK: Academic Press.
- Krashen, S. D. (2003). *Explorations in language acquisition and use*. Portsmouth, NH: Heinemann
- Lalande, J. F. (1982). Reducing composition errors: An experiment. *The Modern Language Journal*, 66(2), 140-149. doi:10.2307/326382
- Lincoln, Y., & Guba, E. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage Publications.
- Loewen, S., & Reinders, H. (2011). *Key concepts in second language acquisition*. England, UK: Palgrave Macmillan.
- Long, M. H. (1981). Input, interaction, and second-language acquisition. *Annals of the New York Academy of Sciences*, 379, 259-278. doi:10.1111/j.1749-6632.1981.tb42014.x
- Long, M. H. (1996). The role of the linguistic environment in second language acquisition. In W. C. Ritchie & T. K. Bhatia (Eds.), *Handbook of second language acquisition* (pp. 413-468). San Diego, CA: Academic Press.
- Lyster, R., Saito, K., & Sato, M. (2013). Oral corrective feedback in second language classrooms. *Language Teaching*, 46(1), 1-40. doi:10.1017/S0261444812000365
- Mackey, A., & Gass, S. M. (2005). *Second language research: Methodology and design*. Mahwah, NJ: Lawrence Erlbaum.
- Master, P. (1995). Consciousness raising and article pedagogy. In D. Belcher & G. Braine (Eds.), *Academic writing in a second language: Essays on research and pedagogy* (pp. 183-204). Norwood, NJ: Ablex Publishing Corporation.
- McLaughlin, B. (1987). *Theories of second language learning*. London, UK: Edward Arnold.
- McLaughlin, B. (1990). Restructuring. *Applied linguistics*, 11(2), 113-128. doi:10.1093/applin/11.2.113
- Merriam, S. B. (1988). *Case study research in education: A qualitative approach*. San Francisco, CA: Jossey-Bass.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: A sourcebook of new methods* (2nd ed.). Thousand oaks, CA: Sage publications.
- Nassaji, H., & Swain, M. (2000). Vygotskian Perspective on Corrective Feedback in L2: The Effect of Random versus Negotiated Help on the Learning of English Articles. *Language Awareness*, 9(1), 34-51. doi:10.1080/09658410008667135
- National College English Testing Committee. (2006). *Syllabus for college English test*. Shanghai, China: Shanghai Foreign Language Education Press.
- Ortega, L. (2009). *Understanding second language acquisition*. London: Hodder Education.
- Pallant, J. (2013). *SPSS survival manual*. England, UK: McGraw-Hill International.
- Patton, M. Q. (1980). *Qualitative evaluation methods*. Beverly Hills, CA: Sage Publications.
- Patton, M. Q. (1990). *Qualitative evaluation and research methods*. Newbury Park, CA: Sage Publications.
- Phillips, D. C., & Burbules, N. C. (2000). *Postpositivism and educational research*. Lanham, MD: Rowman & Littlefield Publishers.

- Qi, D. S., & Lapkin, S. (2001). Exploring the role of noticing in a three-stage second language writing task. *Journal of Second Language Writing*, 10(4), 277-303. doi:10.1016/S1060-3743(01)00046-7
- Reichelt, M. (2001). A critical review of foreign language writing research on pedagogical approaches. *The Modern Language Journal*, 85(4), 578-598. doi:10.1111/0026-7902.00127
- Richards, J. C. (1971). A Non-Contrastive Approach to Error Analysis. *ELT Journal*, 25(3), 204-219. doi:10.1093/elt/XXV.3.204
- Robb, T., Ross, S., & Shortreed, I. (1986). Salience of feedback on error and its effect on EFL writing quality. *TESOL quarterly*, 20(1), 83-96. doi:10.2307/3586390
- Robinson, P. (1995). Attention, memory, and the "noticing" hypothesis. *Language Learning*, 45(2), 283-331. doi:10.1111/j.1467-1770.1995.tb00441.x
- Robinson, P. (2003). Attention and memory during SLA. In C. J. Doughty, Long, M. H. (Ed.), *Handbook of second language acquisition* (pp. 631-678). Malden, MA: Blackwell Publishing.
- Schmidt, R. (1990). The Role of Consciousness in Second Language Learning. *Applied linguistics*, 11(2), 129-158. doi:10.1093/applin/11.2.129
- Schmidt, R. (1994). Deconstructing consciousness in search of useful definitions for applied linguistics. In J. H. Hulstijn & R. Schmidt (Eds.), *Consciousness in second language learning: AILA Review 11* (pp. 11-26)
- Schmidt, R. (2001). Attention. In P. Robinson (Ed.), *Cognition and second language instruction* (pp. 3-32). Cambridge, UK: Cambridge University Press
- Schmidt, R. W. (1995). Consciousness and foreign language learning: A tutorial on the role of attention and awareness in learning. In R. W. Schmidt (Ed.), *Attention and awareness in foreign language learning*. Honolulu, HI: University of Hawaii Press.
- Semke, H. D. (1984). Effects of the red pen. *Foreign Language Annals*, 17(3), 195-202. doi:10.1111/j.1944-9720.1984.tb01727.x
- Sheen, Y. (2007a). The effect of focused written corrective feedback and language aptitude on ESL learners' acquisition of articles. *TESOL quarterly*, 41(2), 255-283. doi:10.1002/j.1545-7249.2007.tb00059.x
- Sheen, Y. (2007b). The effects of corrective feedback, language aptitude, and learner attitudes on the acquisition of English articles. In A. Mackey (Ed.), *Conversational interaction in second language acquisition: A series of empirical studies* (pp. 301-322). Oxford, UK: Oxford University Press.
- Sheen, Y. (2011). *Corrective feedback, individual differences and second language learning*. The Netherlands: Springer.
- Sheen, Y., Wright, D., & Moldawa, A. (2009). Differential effects of focused and unfocused written correction on the accurate use of grammatical forms by adult ESL learners. *System*, 37(4), 556-569. doi:10.1016/j.system.2009.09.002
- Sheppard, K. (1992). Two feedback types: Do they make a difference? *RELC Journal*, 23(1), 103-110. doi:10.1177/003368829202300107
- Shintani, N., & Ellis, R. (2013). The comparative effect of direct written corrective feedback and metalinguistic explanation on learners' explicit and implicit

- knowledge of the English indefinite article. *Journal of Second Language Writing*, 22(3), 286-306. doi:10.1016/j.jslw.2013.03.011
- Shintani, N., Ellis, R., & Suzuki, W. (2014). Effects of Written Feedback and Revision on Learners' Accuracy in Using Two English Grammatical Structures. *Language Learning*, 64(1), 103-131. doi:10.1111/lang.12029
- Stake, R. E. (1995). *The art of case study research*. Thousand oaks, CA: Sage Publications.
- Swain, M. (1995). Three functions of output in second language learning. In G. Cook & B. Seidlhofer (Eds.), *Principle and practice in applied linguistics: Studies in honour of H.G. Widdowson* (pp. 125-144). Oxford, UK: Oxford University Press.
- Tomlin, R. S., & Villa, V. (1994). Attention in cognitive science and second language acquisition. *Studies in second language acquisition*, 16(2), 183-203. doi:10.1017/S0272263100012870
- Truscott, J. (1996). The case against grammar correction in L2 writing classes. *Language Learning*, 46(2), 327-369. doi:10.1111/j.1467-1770.1996.tb01238.x
- Truscott, J. (1999). The case for "The case against grammar correction in L2 writing classes": A response to Ferris. *Journal of Second Language Writing*, 8(2), 111-122. doi:10.1016/S1060-3743(99)80124-6
- Truscott, J. (2007). The effect of error correction on learners' ability to write accurately. *Journal of Second Language Writing*, 16(4), 255-272. doi:10.1016/j.jslw.2007.06.003
- Truscott, J., & Hsu, A. Y. p. (2008). Error correction, revision, and learning. *Journal of Second Language Writing*, 17(4), 292-305. doi:10.1016/j.jslw.2008.05.003
- Van Beuningen, C. G., De Jong, N. H., & Kuiken, F. (2008). The effect of direct and indirect corrective feedback on L2 learners' written accuracy. *ITL-Review of Applied Linguistics*, 156, 279-296. Retrieved from <http://dare.uva.nl>
- Van Beuningen, C. G., De Jong, N. H., & Kuiken, F. (2012). Evidence on the effectiveness of comprehensive error correction in second language writing. *Language Learning*, 62(1), 1-41. doi:10.1111/j.1467-9922.2011.00674.x
- Williams, J. (2012). The potential role (s) of writing in second language development. *Journal of Second Language Writing*, 21(4), 321-331. doi:10.1016/j.jslw.2012.09.007
- Wood, D., Bruner, J. S., & Ross, G. (1976). The Role of Tutoring in Problem Solving. *Journal of child psychology and psychiatry*, 17(2), 89-100. doi:10.1111/j.1469-7610.1976.tb00381.x
- Yang, Y., & Lyster, R. (2010). Effect of form-focused practice and feedback on Chinese EFL learners' acquisition of regular and irregular past tense forms. *Studies in second language acquisition*, 32(2), 235-263. doi:10.1017/S0272263109990519

APPENDICES



Appendix A

Invitation Letter to Mr. Dang, Head of English Department, Baoji University of Arts and Sciences

Dear Mr. Dang,

I am Qi Guo and I am doing PhD at Auckland University of Technology in New Zealand. I am writing to you because I would like to conduct my PhD research at Baoji University of Arts and Sciences and would be most appreciative if I were given permission to do this. I believe my studies will benefit our students and teachers regarding English teaching and learning. I also believe that this research will make a significant contribution to the field of EFL (English as a Foreign Language).

To be more specific, my research will investigate to what extent written corrective feedback on students' writing facilitate their acquisition of English grammar and why written corrective feedback is more effective on some students, but less on others. Research to date has focused mainly on the written production, my research, however, will have an insight into how each student responds and uses the written corrective feedback they have got. I hope my research will provide a better understanding of written corrective feedback and what will be the possible factors which have an impact on the effectiveness of written corrective feedback.

Six intact classes of first year non-English majors will be invited to participate in my study. I would like the students first participate in the quasi-experimental study, and then a small portion of participants will be invited to participate in the follow-up case study, in which a one-on-one intervention will be conducted. I would ensure that the students are voluntary to participate in the study and I hope to provide them with additional opportunities to use and develop their English skills.

My PhD supervisor is Professor John Bitchener at Auckland University of Technology. If you would like to contact him regarding my status in the program, his e-mail address is john.bitchener@aut.ac.nz.

Yours sincerely,

Qi Guo

Appendix B



致宝鸡文理学院外语系主任的邀请信

党主任：

我是郭琪，现在在奥克兰科技大学攻读应用语言学博士学位。这次写信给您是因为我希望能在贵校进行博士研究。我相信我的研究能够使参与学生获益，亦可以使代课老师受到启发，我更相信我的研究能为整个英语教学领域做出贡献，所以我希望能获得您的允许进行研究。

我的研究方向是对比是否不同的纠错反馈方式对学生的语法学习会产生不同的效果，并考察为什么有的学生获益多，而有的学生获益少。不同于以往的纠错反馈研究的是，我的研究会深入的探查学生对于纠错反馈做出如何反应，如何应用纠错反馈。我希望我的研究能够对纠错反馈的作用提供一个更深入的理解，并且找出可能影响纠错反馈作用的一些因素。

我将邀请 6 个原始班级的学生参加我的研究。他们应该是非英语专业的大一新生。他们将首先参与一个准实验性研究，然后很少一部分学生将被邀请参加个案研究。参加个案研究的学生将有机会获得一对一的纠错反馈辅导。我会确保学生们是自愿参加我的研究项目，我也希望为学生们提供更多的机会，帮助他们提高英语学习。

我的博士指导老师是奥克兰科技大学的 John Bitchener 教授，如果您需要联系我的导师，他的邮件地址是：john.bitchener@aut.ac.nz。

此致

敬礼

郭琪

Appendix C



Participant Information Sheet for Student Participants

Date Information Sheet Produced:

25 September, 2011

Project Title:

The effectiveness of written CF for L2 development: A mixed-method study of written CF types, error categories and proficiency levels

An Invitation

I'm a PhD student at Auckland University of Technology in Auckland, New Zealand. You are invited to consider participating in my research study. I will be evaluating the effectiveness of various types of written corrective feedback on your English writing and what are the possible factors which have an impact on the effectiveness. This form will describe the purpose and nature of the study and your rights as a participant in this study. The decision to participate or not is yours. You may withdraw yourself or any information that you have provided for this project at any time prior to the completion of data collection without being disadvantaged in any way. If you withdraw, all relevant information including tapes and transcripts, or parts thereof, will be destroyed.

What is the purpose of this research?

This study will look at whether there is any differential effectiveness of different types of written corrective feedback, any relationship between written corrective feedback types, proficiency level and targeted error types. Reports, papers, and articles based on my dissertation may be published in the future.

How was I identified and why am I being invited to participate in this research?

You have been asked to participate in this study because you are a first year non-English major in university.

What will happen in this research?

You will write in response to a prompt four times over a period of nineteen weeks. If you participate in the case study, which will start in the ninth week and finish in the nineteenth week, you will be asked to take part in a one-on-one intervention.

What are the discomforts and risks?

There will be no risk at all and I do not expect that you will feel any form of discomfort. If you do, please feel free to discuss any issue with me.

How will these discomforts and risks be alleviated?

If you feel uncomfortable about the recording or one-on-one intervention, any question can be unanswered, or the recording and/or intervention will be stopped at any time you say so, and you will not be disadvantaged in any way.

If you feel uncomfortable while answering the questionnaire, you are free to stop at any time or leave any question blank. You will not be disadvantaged in any way.

What are the benefits?

The results of the study will lead to new insights into the moderating role of error type and proficiency level on the effectiveness of written CF in the field of second language teaching and learning, an area which has not received much attention in research literature to date. For students participating in the study (writing prompts, and one-on-one intervention), you will be able to reflect on how you respond to and make use of feedback and be able to make it facilitate your English learning.

How will my privacy be protected?

The researcher will not know who the participant is, and the information provided by the participants will not be revealed to anyone else except the researcher and her supervisor. The teachers of the participants will have no access to the information.

What are the costs of participating in this research?

The duration of the main study is 19 weeks. In the first week, you need to spend 40 minutes writing in response to a writing prompt. In the third week, you need to spend 5 minutes looking at the feedback given to you, and then do another writing prompt within 40 minutes. In the seventh week, you need to spend 40 minutes to write on the third writing prompt. In the nineteenth week, the last piece of writing will cost you 40 minutes.

If you agree to take part in the case study which will start in the ninth week, you will need to participate in a one-on-one intervention. First, you will be asked to

correct the errors in the first piece of writing with the help of written CF. If you cannot, more explicit written CF assistance will be provided. Then you will be asked to identify and correct the targeted errors in your second piece of writing, and if you need, written CF assistance will be provided. Besides, you will be asked to revise your third piece of writing which is completed in the seventh week. The one-on-one intervention will last for an hour. In the nineteenth week, you will need to write in response to the last writing prompt in 40 minutes.

What opportunity do I have to consider this invitation?

You will have two days to decide if you want to participate in this study. Participation in this study is strictly voluntary. That means you do not have to be a part of the study. Your decision to participate will in no way affect your grade in any class.

How do I agree to participate in this research?

If you do decide to participate, you must first complete a consent form. If at any point you change your mind and no longer want to participate, you can tell me.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Prof. John Bitchener, john.bitchener@aut.ac.nz +64 921 9999 ext7830.

Concerns regarding the conduct of the research should be notified to the Executive Secretary, AUTECH, Rosemary Godbold, rosemary.godbold@aut.ac.nz +64 921 9999 ext 6902.

Whom do I contact for further information about this research?

Researcher Contact Details: Qi Guo, zqwmdgq@hotmail.com

Project Supervisor Contact Details: Professor John Bitchener, john.bitchener@aut.ac.nz +64 921 9999 ext7830.

Appendix D



研究项目信息

制定日期:

2011年9月25日

项目名称:

纠错反馈方法，错误类型和学生英语水平对英语学习促进作用的的综合研究

研究者: 郭琪

邮件地址: zqwmdgq@hotmail.com

简介:

我在奥克兰科技大学攻读应用语言学博士学位。你被邀请参加我的博士研究项目。我将考察纠错反馈对你英语学习的作用，并找出影响纠错反馈作用的相关因素。此研究项目信息将使你了解我的研究目的和你作为参与者的权利。你自主决定是否愿意参加我的研究。在参与过程中，你可以随时退出，这将不会给你带来任何不良影响。如果你中途退出，你的所有信息将被销毁。

研究项目介绍:

该研究的目的在于探究是否不同形式的纠错反馈会对学生的语法学习产生不同的效果，并找出纠错反馈和语法种类，学生英语程度，和学生的观念和态度之间是否有任何关联。基于该研究项目，我将会完成我的博士论文，发表文章等。

参与者:

你被邀请参加我的研究，因为你是非英语专业的大一新生。

参与意义:

该研究中收集的数据将为纠错反馈提供更深入理解，也会为外语的教与学提供新的知识。你将会被邀请参与英语写作，这将会有助于你的英语学习和对自己的英语学习进行深入的了解。

参与要求:

你将会在 19 周的时间内完成 4 篇英文写作，每篇写作将耗时 40 分钟。如果你参加个案研究，除了写作，你还要参与一个一对一的纠错反馈辅导，调查者将在 60 分钟内对你提供个人的辅导。

风险可能:

该研究项目不会有任何风险，也不会让你感到不适。如果任何内容使你感到不适，你可以及时和我联系。

如果你对于录音感到不舒服，你可以立即叫停。

如果你对于回答问卷的问题感到不舒服，你可以不做回答。这对不会对你造成任何不良的后果。

参与决定:

你将有 2 天的时间决定是否参与该研究项目。对于本研究的参与是完全自愿的。如果你不愿意参加，不会对你造成任何不良后果；如果你决定参加，你需要在参与同意书上签字。在参与过程中的任何时候你改变主意，都可以告知我，随时退出该研究。

问题联系人:

如果你对该研究的本质有任何问题，可以联系我的导师 John Bitchener 教授。他的邮件地址: john.bitchener@aut.ac.nz，联系电话: +64 921 9999 转 7830.

如果你对该项目的操作有任何问题，可以联系奥克兰科技大学伦理董事会的执行秘书 Rosemary Godbold 博士,她的邮件地址为:
rosemary.godbold@aut.ac.nz , 联系电话: +64 921 9999 转 7772.

项目信息联系人:

如果你对本研究有任何问题，请联系我：郭琪 邮件地址：
zqwmdgq@hotmail.com

Appendix E



Participant Consent Form for Student Participants

Project title: The effectiveness of written CF for L2 development: A mixed-method study of written CF types, error categories and proficiency levels

Project Supervisor: Prof. John Bitchener

Researcher: Qi Guo

- I have read and understood the information provided about this research project in the Information Sheet dated 25 September, 2011.
- I have had an opportunity to ask questions and to have them answered.
- I understand that notes will be taken during the one-on-one intervention, and the one-on –one intervention and the oral tests will be audio-taped and transcribed.
- I understand that I may withdraw myself or any information that I have provided for this project at any time prior to completion of data collection, without being disadvantaged in any way.
- If I withdraw, I understand that all relevant information including tapes and transcripts, or parts thereof, will be destroyed.
- I agree to take part in this research and allow what I say and the information I provide in it to be used for the second language teaching and learning study.
- I understand only the researcher and the supervisor have access to the recordings and they will always be kept confidential.
- I wish to receive a copy of the report from the research (please tick one):
Yes No

Participant’s signature:

Date :

Participant’s name :

Participant’s Contact Details (if appropriate).....

Appendix F



参与同意书

项目名称： 纠错反馈方法，错误类型和学生英语水平对英语学习促进作用的的综合研究

指导老师： John Bitchener 教授

研究者： 郭琪

- 我已经参阅并理解了 2011 年 9 月 25 日制定的项目参与信息。
- 我已经获得机会询问相关问题并得到解答。
- 我已经获悉一对一的辅导过程和口语测试会被录音和记录。
- 我已经获悉在参与中我可以随时退出该项目，并撤出我提供的任何信息，这不会对我造成任何不良后果。
- 我已经获悉如果我退出研究，我所提供的任何信息，包括录音等都会被销毁。
- 我同意参加该研究项目，并允许将我所提供的信息用于外语的教学研究。
- 我已经获悉只有研究者和其导师可以参阅我提供的信息，他们将对我提供的信息保密。
- 我希望获得一份该项目的研究报告 (请选择): 是 否

参与者签名: 日期:

参与者姓名:

参与者联系方式 (可选):

.....

Appendix H



MEMORANDUM

Auckland University of Technology Ethics Committee (AUTEC)

To: John Bitchener
From: **Dr Rosemary Godbold** Executive Secretary, AUTEC
Date: 25 October 2011
Subject: Ethics Application Number 11/269 **The extent to which WCF (Written Corrective Feedback) facilitates EFL (English as a Foreign Language) students' acquisition of grammar.**

Dear John

Thank you for providing written evidence as requested. I am pleased to advise that it satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC) at their meeting on 10 October 2011 and I have approved your ethics application. This delegated approval is made in accordance with section 5.3.2.3 of AUTEC's *Applying for Ethics Approval: Guidelines and Procedures* and is subject to endorsement at AUTEC's meeting on 14 November 2011.

Your ethics application is approved for a period of three years until 25 October 2014.

I advise that as part of the ethics approval process, you are required to submit the following to AUTEC:

- A brief annual progress report using form EA2, which is available online through <http://www.aut.ac.nz/research/research-ethics/ethics>. When necessary this form may also be used to request an extension of the approval at least one month prior to its expiry on 25 October 2014;
- A brief report on the status of the project using form EA3, which is available online through <http://www.aut.ac.nz/research/research-ethics/ethics>. This report is to be submitted either when the approval expires on 25 October 2014 or on completion of the project, whichever comes sooner;

It is a condition of approval that AUTEC is notified of any adverse events or if the research does not commence. AUTEC approval needs to be sought for any alteration to the research, including any alteration of or addition to any documents that are provided to participants. You are reminded that, as applicant, you are responsible for ensuring that

research undertaken under this approval occurs within the parameters outlined in the approved application.

Please note that AUTEK grants ethical approval only. If you require management approval from an institution or organisation for your research, then you will need to make the arrangements necessary to obtain this. Also, if your research is undertaken within a jurisdiction outside New Zealand, you will need to make the arrangements necessary to meet the legal and ethical requirements that apply within that jurisdiction.

When communicating with us about this application, we ask that you use the application number and study title to enable us to provide you with prompt service. Should you have any further enquiries regarding this matter, you are welcome to contact me by email at ethics@aut.ac.nz or by telephone on 921 9999 at extension 6902.

On behalf of AUTEK and myself, I wish you success with your research and look forward to reading about it in your reports.

Yours sincerely

Dr Rosemary Godbold
Executive Secretary
Auckland University of Technology Ethics Committee

Cc: Qi Guo zqwmdgq@hotmail.com