The Effects of Peer Editing versus Co-writing on Writing in Chinese-as-a-foreign Language

by

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Abstract

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The study, using a within-group design with eighteen adult high-beginner Chinese L2 learners, investigated the effects of peer review and co-writing on writing in Chinese-as-a-foreign language. Three writing conditions (peer review, co-writing, and individual writing) and three narrative writing topics were counterbalanced for the collection of data, including forty-five writing products, seventy-two questionnaires, videorecorded screen activities and interactions.

The research has three main aims: (a) to investigate the effects of peer review and co-writing on writing with respect to fluency, complexity, and accuracy, (b) to explore the nature of verbal interactions during peer review and co-writing, and (c) to investigate students' perceptions of the three writing activities.

With regard to writing performance, the research found no statistically significant differences in measures of fluency and complexity. However, peer review and co-writing resulted in significantly more accurate writing than individual writing, but no difference was observed in the two collaborative writing activities.

The analysis of verbal interactions indicated that (1) there were significantly more on-task episodes in peer review than in co-writing; (2) there were significantly more language-related episodes (LREs) and content-related episodes in peer review than in co-writing, while there were significantly more idea-related episodes and text-assessing episodes in co-writing than in peer review; (3) students paid significantly more attention to LRE-lexis and LRE-grammar in peer review than in co-writing, and the differences were mainly observed in discussions on word meanings, verb forms, word usage, and sentence/phrase meanings; and (4) there were also significantly more spelling episodes in peer review than in co-writing.

Concerning students' perceptions, although students tended to prefer co-writing to peer review and peer review to individual writing, they held competing attitudes toward the three activities and believed each of the three had their own strengths, which could not be replaced by the advantages of the other.

The findings suggest that peer review, co-writing, and individual writing play different roles in Chinese L2 learners' development of writing skills, as measured by a range of linguistic indices and as revealed by students' evaluations. Thus, they are all important because they direct learners to different aspects of their language development.

TABLE OF CONTENTS

List of Tables

List of Figures

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CHAPTER ONE – INTRODUCTION

1.1 Background and Purpose of the Study

The purpose of this study is to examine the roles of peer review and co-writing in the writing of adult Chinese-as-a-foreign language (CFL) learners. In the study, peer review is defined as an activity in which students complete their writing individually and then revise their writing in response to feedback from a peer. Co-writing refers to the situation in which students work together in pairs, from the beginning to the end, to produce one joint writing task. Since both peer review and co-writing require student collaboration in the writing process, the two writing activities are instances of collaborative writing. Another often used classroom practice, namely individual writing, is included in the study as comparison, and is defined as an activity in which students produce their writing individually throughout the writing process.

Writing is often used as a teaching strategy to help second/foreign language (L2) learners examine their own linguistic knowledge of the target language and to help L2 instructors examine students' progress and evaluate their language performance. More importantly, writing, as a mode of learning (Cumming, 2002), is an important skill for language learners to develop. Writing instructors typically use a variety of methods in trying to help students improve their writing. When students try to express their ideas in writing using the target language, they are "pushed" to produce target forms comprehensible to readers. According to Swain (1985), this process facilitates students' second language acquisition (SLA). To motivate students to get more involved in writing activities, an increasing number of L2 classes have implemented a range of writing

activities in addition to individual writing, including, but not limited to, peer review and co-writing.

Peer review and co-writing draw theoretical support from social-construction theories, including Vygostky's social-constructivist theory, which posits that learning occurs when people work together (Vygostky 1978, 1986; Wertsch 1985), and also cognitive theories, including cognitive writing process theory, which highlights the recursive nature of writing (Flower & Hayes, 1981; Flower, 1989). Collaborative writing techniques also gain pedagogical support from current teaching approaches, such as the communicative language teaching (Hedge, 1988), which encourages teachers to involve students in communicative activities in their language learning process. Peer review and co-writing are two collaborative writing activities which require students to work together at different stages of the writing process. Both the social constructivist and cognitive writing process theories stress the value of such collaboration between peers. However, these theories also emphasize the notion that idea generation in the writing process occurs not only during the revision stage, but rather, recursively at all stages of the writing process (Flower & Hayes, 1981; Flower, 1989). Thus, empirical research is necessary to investigate the two collaborative writing activities in comparison to individual writing activities.

An extensive body of research has focused on peer review; however, this research has yielded controversial results. Some research has shown that peer review benefits L2 learners' writing skills and SLA (e.g., Hedgcock & Lefkowitz, 1992; Mendonca & Johnson, 1994; Tsui & Ng, 2000), while other studies have demonstrated the limitations of such techniques, such as cultural conflicts and students' preference for teacher

comments (e.g., Carson & Nelson, 1994, 1996; Nelson & Carson, 1995, 1998; Connor & Asenavage, 1994; Zhang, 1995). The literature review also reveals that while the benefits of peer review have been extensively studied, most research has compared peer review with teacher feedback or has explored the complexity of student interaction. However, as noted by Suzuki (2006), "there is little research which compares self-revision to peer review without teacher instruction or feedback" (p.19). Since the ultimate goal of practicing writing is to assist students to develop into independent writers, it is necessary to conduct more studies to better understand the relative effectiveness of peer and self-revision when teacher feedback is not available.

Co-writing has not received as much attention as peer review in the literature, perhaps because of its relatively more recent introduction to L2 classrooms (Nixon, 2007; Storch, 2005). Research on co-writing has examined learners' use of their first language (L1) during interaction (e.g., Swain & Lapkin, 1998, 2000a, 2000b), different dyadic dynamics, and the relationship between dyadic dynamics and co-writing products (Storch, 2002, 2003). Research comparing the co-writing products with products of other writing activities is scarce, comprising only three studies (Nixon, 2007; Storch, 1999; Storch, 2005). In these studies, no significant difference has been found among writing activities, and students have been found to hold mixed feelings about co-writing. The limited research on co-writing suggests that more research is needed to examine the effectiveness of co-writing.

It is important to compare peer review and co-writing. Storch (2005) argues that the drawback of peer review is that, unlike co-writing, it focuses only on writing products. By contrast, co-writing provides students with the opportunity to discuss and co-construct

texts during the whole process of writing (Hirvela, 1999; Nixon, 2007). When collaboration is introduced into classrooms, it is also worthwhile to investigate the different effects of different collaborative writing activities so that language instructors can align instruction strategies and objectives. However, no research has compared peer review and co-writing.

The study has three main aims: a) to investigate the effects of peer review and co-writing on adult CFL students' writing performance, b) to explore the nature of student verbal interaction during peer review and co-writing, and c) to investigate students' perceptions of peer review, co-writing, and individual writing.

1.2 Significance of the Study

As mentioned earlier, while the research on peer review is extensive, little research has examined the effectiveness of peer review versus individual writing (Suzuki, 2006). Meanwhile, co-writing has not received enough attention in SLA research (Nixon, 2007; Storch, 2005), and no study has compared peer review and co-writing, including their effects on student writing performance, the nature of verbal interaction, and student perceptions. Thus, this study will make important theoretical and practical contributions to the SLA field. The current study is also significant in investigating students' writing practice in Chinese L2. Most research on L2 writing has been conducted on L2 students of English, French, and Spanish. Little research focuses on writing in Chinese L2, a lack also observed by Duff and Li (2004). Wang (2007) also points out that collaborative writing tasks are rarely used in Chinese L2 classes. To fully explore the effects of

different writing activities in L2 classes, more research on instruction in different languages is needed. In keeping with the increasing interest in Chinese language learning, the demand for research in this field is rising. Theoretically, the findings of this study will increase our knowledge of different writing activities; and, in particular, the research will enrich the field by investigating writing in Chinese L2. In practice, the study will stimulate post-secondary L2 educators to reflect upon the effectiveness of language teaching methods involving different writing activities.

1.3 Outline of the Dissertation

This dissertation consists of seven chapters. The first chapter has defined the three writing activities to be examined in the study, and has presented the background, purpose, and significance of the study.

Chapter two begins with a discussion of two fundamental theories (i.e., cognitive writing process theory and social-constructivist theory) for the implementation of collaborative writing in L2 classes. Then, the chapter goes on to review literature on peer review and co-writing, including a discussion of issues and gaps in the research literature. Chapter two concludes with the a discussion of the rationale for the current study and three research questions.

Chapter three presents the research methodology employed in the current study, starting with the design and participants. Then, the procedure, including three research instruments, two pilot studies, the data collection procedure, and two software programmes used in data collection, is described.

Chapters four, five and six report the findings for each of the three research questions introduced in Chapter two. Chapter four analyzes student writings in the three writing conditions. Chapter five explores the nature of student verbal interaction during the revision stage in the two collaborative writing activities. Chapter six discusses student perceptions of the pros and cons of all three writing activities examined in this study.

Chapter seven discusses the findings of the study, and presents the implications of the current research for second language teaching and learning. The chapter also states the limitations of the study and provides directions for future research.

CHAPTER TWO – REVIEW OF THE LITERATURE

This chapter begins with a discussion of two fundamental theories that support the use of collaborative writing in L2 classes, namely, social-constructivist theory and cognitive writing process theory. The second section outlines prior research on peer review, including research that compares teacher and peer feedback and research that investigates student interaction in peer review. The third section reviews prior research on co-writing, including research that compares individual writing and co-writing and the research that investigates student interaction in co-writing. The last section introduces the statement of purpose and the research questions for the current study.

2.1 Theoretical Framework

Peer review and co-writing receive theoretical support from social-constructivist theories, which view knowledge as socially accepted belief and see social interaction as influencing individual cognitive development (Bruffee, 1986; Vygotsky, 1978, 1981a; Wertsch, 1985). According to social constructivists, "learning occurs among persons rather than between a person and things" (Bruffee, 1986, p. 787). These theories posit that people construct certain knowledge when they have achieved a general agreement about what they know in a community, with the consequence that knowledge changes or improves "as the community reconstructs itself" (Grabe & Kaplan, 1996, p.380). In terms of language development, the theories argue that peer interaction plays an important role in the development of individuals' linguistic knowledge.

Current social-constructivist theories owe much to the work of Lev S. Vygotsky, a mid-twentieth century Soviet social psychologist. An important theoretical concept of Vygotsky's social-constructivist theory is 'inter- and intra-psychological processes'. Vygotsky (1978) argues for a complex relationship between individual psychological development and social interaction. According to him, individual cognitive development cannot be achieved or furthered by isolated learning. Rather, he believes that people's intellectual development is closely related to the people they interact with and the way they interact. That is, learning occurs when more than one person is involved and when people are engaged in social interaction. To clearly explain this complicated relationship, Vygotsky (1981a) put forward a 'general genetic law of cultural development':

> Any function in the child's cultural development appears twice, or on two planes. First, it appears on the social plane, and then on the psychological plane. First it appears between people as an interpsychological category, and then within the child as an intrapsychological category. This is equally true with regard to voluntary attention, logical memory, the formation of concepts, and the development of volition (p. 163).

Wertsch (1985) claims that the above-cited law highlights two important ideas in Vygotsky's theory. First, it explains individual and concrete group interactions play a crucial role in individual cognitive development. Second, it reveals the "inherent connection" between two modes of functioning: interpsychological (in communication) and intrapsychological (in thinking), in which social interactions act as the intermediary for individual cognitive development (p. 61). Lantolf and Appel (1994) further suggest that the transition from the inter- to the intra-psychological plane "marks the beginning of

the child's control over his or her own behavior – that is, self-regulation" (p. 11). This process should be applicable to adult L2 learners as well.

So far as writing classes are concerned, the relationship between inter- and intra-psychological processes suggests that peer interaction activities can be introduced into such L2 classes because peer interaction provides students with occasions to participate in concrete social interaction, trying to solve problems together by using the target language. Language now is "simultaneously a means of communication and a tool for thinking" (Swain & Lapkin, 1998, p. 320). In this external social activity, students have a chance to work with peers on the language itself. When students transfer the L2 knowledge developed in the social interaction to their internal psychological plane, they are likely to construct knowledge of the language, consciously or subconsciously.

A second theoretical concept is 'internalization'. According to Vygotsky (1981a), internalization is not a simple transfer of external social development to a higher individual mental plane, although social function mediates the function of the intramental plane. Vygotsky emphasizes that internalization as a process is only achieved when people are able to "create" on their internal planes what has been performed in external social reality. That is, while internalization transforms social function to internal psychological function, it also changes the structure and functions of the process (Vygotsky, 1981b).

Vygotsky uses an example of a child's internalization of non-verbal pointing to illustrate this internalization process. When a child tries to grasp an object, the adult may interpret his attention as a directing sign and thus passes the object to the child. Wertsch (1985) explains that a child's mental functioning has begun to change from an

unsuccessful non-communicative grasping movement to a successful communicative indication when s/he begins to master and use an indicatory gesture to direct an adult's attention to an object. His or her consciousness has developed on the plane of mental development functioning. In the future, the child may use this gesture in forthcoming demands, suggesting "additional development on the intrapsychological plane" and "subsequent progress on the interpsychological plane" (p.65). This example illustrates the process of internalization and the inherent connection between inter- and intrapsychological functioning.

When L2 students try to express themselves in a verbal or written form during peer interaction in peer review or co-writing, if they can successfully express their intended meanings, an internal plane of consciousness may be formed and thus the knowledge of the language may be internalized. If they fail to express themselves effectively, the language forms may not be internalized. The external reality helps them to clarify their points until they can consciously produce an acceptable expression and make themselves understood. This acceptable expression may not exist in the language learner's intramental plane until it is created in their internal cognitive development through this peer-to-peer external interaction. In such a process, the knowledge that is internalized may become part of their internal plane, and is then available for use in their revised writing and future language performance.

A third and very influential concept of Vygotskian theory is the Zone of Proximal Development. In explaining the relationship between instruction and development, Vygotsky (1978) introduces this concept of the ZPD to examine "those functions that have not yet matured but are in the process of maturation, functions that will mature

tomorrow but are currently in an embryonic state" (p. 86). The ZPD is defined as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (p. 86). Vygotsky contends that students' actual developmental level will reach their potential developmental level when they interact with more capable people or cooperate with their peers within the zone of proximal development (1978). He further argues that instruction itself is not development. Only when instruction is in students' zone of proximal development does it become effective because it would trigger the functions which are in the process of maturation (Vygotsky, 1934; cited in Wertsch, 1985). According to Vygotsky, the shift from other-regulation, or intermental activity, to self-regulation, or intramental activity, takes place in the ZPD, which is determined by the learner's current level of development together with the form of instruction received (Wertsch, 1985). When this learning process is internalized, the learner's independent development is achieved.

Many researchers have provided evidence that collaboration with peers creates mutually supporting zones of proximal development (e.g. De Guerrero & Villamil, 1994, 2000; Moll, 1989; Nassaji & Cumming, 2000; Nassaji & Swain, 2000; Nassaji & Tian, 2010; Nyikos & Hashimoto, 1997; Swain & Lapkin, 1998; Villamil & De Guerrero, 1996, 1998). According to these researchers, in collaborating with peers, students continually exchange their knowledge of the language and use what they know to induce new and more advanced expressions. What they can work out with their peers is within

their developmental level and will develop into their possessed knowledge in the future knowledge they can use independently later.

The concept of the ZPD also has an important implication for collaboration in L2 student writing practice. Peer review and co-writing create a social context for students to interact with one another. In interaction, students, within the ZPD, use what they already possess to develop what they have not mastered independently. When they interact with more capable peers, they may develop new expressions and ways of thinking with their help, furthering their intramental development. When interacting with less experienced peers, students may use their existing linguistic knowledge to give suggestions and thus consolidate their known knowledge, a process occurring on the intrapsychological plane and leading to independent development as well.

In general, the social-constructivist theory provides strong support for the implementation of peer review and co-writing in L2 writing classes: working groups or peer groups provide an external social environment for language learners to interact in. "Social constructionist work in composition is based on the assumption that writing is primarily a social act" (Bruffee, 1986, p. 784). This social interaction is a necessary precondition for language learners' individual psycholinguistic development through internalization of new information. In other words, introducing peer review and co-writing into L2 writing classrooms helps direct students towards their zone of proximal development, enabling them to learn in advance of development. At every stage of the writing process, peers negotiate within their ZPD, and they are likely to develop proper and/or more sophisticated expressions that are currently beyond their actual developmental level, but within their potential developmental level. These better or more

advanced expressions developed in collaboration will eventually be mastered by language learners and used in their subsequent writing. During this process, the target language is used not only to convey meanings, but also to develop meanings. The language itself is developing as well. In Oxford's (1997) words, "Learning occurs while people participate in the sociocultural activities of their learning community, transforming (i.e., constructing) their understanding and responsibilities as they participate" (p. 448).

Another theoretical framework that supports peer review and co-writing is cognitive theories, particularly cognitive writing process theory, which was developed in the 1960s and 1970s and has grown in popularity since the 1980s (Ferris & Hedgcock, 1998). Before the 1960s the predominant focus of writing instruction in North America, referred to as the 'product approach,' was on the form of the written text. In this model of writing instruction, students did little writing, and when they wrote, they were instructed to write three-to-five paragraph texts in one draft. Then, they got a final grade and teacher-written comments, which were usually negative and spanned the whole essay. Students were assumed to be able to discover their problems in writing upon seeing the grade and comments, which they would use to avoid making the same mistakes in their following writing assignments (Grabe & Kaplan, 1996). However, this approach is criticized for limiting students' writing practice and writing skills: many student writers could not meet their teachers' expectation at all and became frustrated by not knowing how to improve their writing (Grabe & Kaplan, 1996). However, "[w]riting is a too complex phenomenon, and history tells us that single visions rarely satisfy many people for very

long" (Flower, 1989, p. 286). Dissatisfaction with the 'product approach' led to the development of the 'process approach'.

The process approach advocates for a process- rather than product-oriented view of the writing, in which good writing is composed of several different stages: pre-writing or planning, several drafts, and post-writing or revision, rather than a single-draft product. A more important view in the development of the process approach is proposed by Flower and Hayes (1981), who further pointed out that writing processes do not unfold in a linear sequence with one stage following another; rather, the stages occur recursively.

To study thinking processes in writing, Linda Flower and John Hayes in 1981, within the theoretical framework of cognitive psychology, proposed a model of the writing process based on their analysis of "thinking aloud" protocols collected from students over five years. This model rests on four "key points". First, the writing process is "a set of distinctive thinking processes", including *planning, translating, and reviewing* (Flower & Hayes, 1981, p. 366). The planning process consists of three sub-processes: *generating ideas, organizing information, and goal-setting*. When a writer composes a text, s/he translates the ideas generated in planning into language on the page, and then reviews and revises it. Flower and Hayes suggested that these processes and sub-processes of writing do not follow a fixed sequence of stages; rather, each mental act (planning, translation, and revision; generating ideas, organizing information, and goal-setting), as a thinking process, may occur at any time in the process of composing (p. 375). This notion—that writing is recursive rather than linear—is the second key point of the theory.

The third key point, which Flower and Hayes claimed as the central principle of the theory, is that writing is "a goal-directed thinking process, guided by the writer's own

growing network of goals" (p. 366). According to Flower and Hayes, there are two types of goals: process goals that instruct the writer how to proceed in the writing process, and content goals that specify the content the writer wants to deliver to readers. They posited that while composing, the writer may begin with an abstract goal, and then develop a relatively specific goal, and eventually an operational goal. These goal-directed thinking processes operate throughout the entire process of writing. In this process, as the writer moves forward, s/he continuously generates new goals or more adequate goals, and may also continually return to his or her higher-level goals. Flower and Hayes believed that this elaborate network of self-made goals directs the writer's further writing.

The fourth and final key point of the theory is that writers' goals are changing and constantly influenced by what they have learned through the writing process. Flower and Hayes explained that while a writer is exploring his or her ideas, s/he is in the process of planning and sets a network of goals and sub-goals. These goals, in turn, help consolidate ideas and regenerate new ideas. Thus, the writer is learning how to compose and these goals serve as a bridge to connect the planning and the forthcoming writing.

In summary, cognitive writing process theory brings to light the thinking processes of individuals in the course of writing. While composing, a writer does not go through the process from one stage to another, but reflects and changes his or her plans and writings based on new ideas or information developed during the process. That is, the writing process is a recursive thinking process. Three words used by Grabe and Kaplan (1996) represent the composing processes: "interactive", "intermingling" and "simultaneous" (p. 91). In addition, composing is a dynamic, goal-directed, and problem-solving process in which sub-goals are constantly regenerated to support the larger goals.

In terms of the cognitive development of individual student writers, Flower (1989) further suggests that in a writing class employing peer review, cognition and social contextual knowledge interact and *construct* one another. She claims that the relationship between cognition and context should not been seen as conflicting, but rather as "strongly interactive" (p. 287). She posits that peer response is an extended social/cultural context within a classroom community in which students construct meaning. At the same time, composing within this context is also a recursive, goal-directed cognitive process. In discussing the interactive relationship between context and cognition, Flower explains that context guides cognition in triggering specific processes in students' experience, thereby influencing writing goals, criteria, and strategies. Meanwhile, a shared context is *mediated* by the cognition of the individual writer, which explains why students write different essays even after they have worked together with peers.

The latter discussion on the cognitive development of students in peer review is also relevant to students involved in co-writing. In the process of co-writing, students interact and construct, or co-construct, a joint paper. The social context is created as soon as the initial planning of writing starts and persists until the writing satisfies both writers. Since two minds work together and interact with each other, new ideas are constantly generated, and plans are thus continuously modified. Both process goals and content goals are better developed when two writers learn from each other and explore new ideas together. This process of social construction is also a cognitive process. Student writers may develop a better understanding of the interactive goal-directed thinking process required in the process of writing. Thus, in their future writing, they may become more

aware of the process and of the need to change ideas and generate new information while thinking.

This writing-as-a-process approach has laid a strong theoretical foundation for the implemetation of peer review and co-writing in writing classes. Grabe and Kaplan (1996) point out that this approach has freed students from the typical one-draft writing assignment; has freed instructors from the assumption that each student should be working alone or only with the instructor on summative feedback; and has encouraged students to be exposed to various resources to get feedback (p. 86-87). In addition, this approach has encouraged students to collaborate because their goals are constantly influenced by what they have learned through the writing process. When students collaborate, they will unavoidably influence and learn from each other.

One implication of this approach for L2 writing classes is that students are encouraged to write multiple drafts in their writing tasks. Because the writing process is actually a set of thinking processes, students may constantly set new goals or subgoals to adjust their planning when they are given the chance to write multiple drafts.

Another implication lies in the response to student writing. Students are encouraged to be exposed to feedback from different sources with different foci (Grabe & Kaplan, 1996), one of which is the incorporation of peer response. Peer response at different stages of the writing process may help students rethink. When student writers receive feedback from their peers, especially after they interact with their peers to discuss their messages, they may reflect on their writing based on their peers' recommendations or their own clarifications developed in interactions; and adjust their sub-goals to better meet their higher-level goals, a process that leads them to evaluate their writing from a

different perspective and to regenerate more appropriate goals. This process is likely to result in better writing and enhanced writing skills.

Cognitive process writing theory has particular implications for L2 tertiary-level institutions because the adult L2 students have already developed their cognitive abilities and bring rich L1 and life experience. They are capable of transforming information to meet specific rhetorical purposes.

To summarize, cognitive writing process theory shifts the emphasis in L1 and L2 classrooms from the one-draft written product to the multiple-draft writing process and encourages students to work collaboratively to discover ideas. Writing is to be seen as both a cognitive activity and a contextually constrained activity, in which the writing ability of individual students grows in concert with the development of strategies for appropriate goal formation (constrained by task environment and content knowledge). Generally speaking, "the process approach is frequently discussed as a wholly positive innovation allowing teachers and students more meaningful interaction and more purposeful writing" (Grabe & Kaplan, 1996, p. 87).

2.2 Research on Peer Review

Many L1 and L2 instructors have used peer review to help students develop their writing skills (Grabe & Kaplan, 1996). Practicing revision is viewed an important component in the process of writing, and it is believed that the provision of feedback in the revision stage becomes a valuable resource to help writers refine their ideas and develop their writing skills. In addition to the traditional resource person, the teacher, peers have

become another main source for providing feedback in the revision stage. Thus, a wealth of research has examined the effects of teacher and peer feedback on student revisions, and students' perceptions of the two types of feedback. Another peer feedback research area relevant to the current study is the investigation of student interactions in the process.

2.2.1 Studies Comparing Teacher and Peer Review

Many studies that compare teacher and peer review have been conducted (1) to investigate the effectiveness of peer review in comparison to the more traditional teacher review, and (2) to explore student perceptions of the two types of review. This research has yielded different findings.

Chaudron (1984) conducted a study with two groups of students at different language proficiency levels. The first group involved 14 advanced ESL students who were divided into two halves. One half revised their first writings based on peer-written feedback, and the other half on teacher-written feedback. Then, students reversed their use of such feedback in revising their second writings. The same procedure was applied to a second group of 17 high intermediate students. Nine advanced and fourteen high intermediate students completed all tasks, and their writings were used for analysis. The researcher found that teacher feedback and peer feedback did not contribute to any significant difference in revisions, and that language proficiency did not play a role in the effect of feedback type on revision. The questionnaire results suggested that students prefer to

receive comments from their native English-speaking teachers than from their fellow ESL students.

Some studies have found that the effect of peer comments on students' revisions is small, especially when compared with the effect of teacher comments. Connor and Asenavage (1994) compared types of revisions made by two four-student groups receiving a sequence of peer comments, teacher comments, and other writing help. The study found that students incorporated very few peer comments in their revisions, only 5% as compared to 35% from teacher comments and 60% motivated by other sources, such as self-revision and tutors in the writing center. Students made both global and local changes[1], and the revisions resulting from teacher comments were mostly superficial. Similar findings were found in Paulus's (1999) study on 11 ESL students receiving comments from a peer, the teacher, and other sources. Although students incorporated a higher percentage of peer feedback (14%) in their revisions than that found in Connor and Asenavage (1994) study (5%), in common with the latter study, students also preferred teacher feedback and incorporated a similar amount of it (34%) into their revisions. Students were able to revise on both the surface and meaning levels. It is notable that the majority (63%) of revisions resulting from peer feedback were meaning changes. The study also reported that the multiple-draft writing approach improved the overall quality of students' writing, but the study design did not permit any conclusion as to whether the improvement was due to peer, teacher, or self/other revision.

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[1] The distinction between global and local changes is based on Faigley and Witte's (1981) taxonomy on types of revision. Global changes, or meaning changes, refer to changes that affect the information present in the text by adding, deleting, or rearranging the ideas. Local changes, or surface changes, refer to changes that alter the surface structure but not adding new or deleting old information.

Nelson and Carson (1998) interviewed five high-intermediate ESL students who, together with six other students, worked in a group of three and two groups of four. The interview results suggested that peer review in L2 classes may not bring the same desired effects found in L1 classes because ESL students prefer teacher comments over peer comments and perceive peer review as relatively ineffective.

On the other hand, some studies comparing the relative effectiveness of teacher and peer comments in facilitating revisions have found that peer comments have positive effects. Hedgcock and Lefkowitz (1992) conducted an experimental study on two groups of low-intermediate learners of French-as-a-foreign language. The control group (n=16) received written teacher feedback, and the experimental group (n=14) engaged in a peer collaborative revision process in groups of three. The writing quality was analyzed for five attributes: content, organization, grammar, vocabulary and mechanics. The analysis showed that the experimental group outperformed the control group in the five attributes and in overall scores. The researchers claimed that collaborative revision plays a facilitative role in developing basic composition skills among L2 learners.

In another experimental study of EFL students in China, Miao, Badger, and Zhen (2006) compared the effects and student perceptions of peer and teacher feedback. The teacher feedback group (n=41) revised their writings based on teacher-written comments, and the peer feedback group (n=38) revised their writings based on student-written comments and dyadic oral interaction. After the final drafts were collected, all students completed a questionnaire, and six students in each group were interviewed. It was found that both groups improved their writing significantly, with the teacher feedback group showing more improvement. The peer feedback group made more meaning changes

(27%) and self-revisions (16 instances) than the teacher feedback group (5%, and 5 instances). A majority of students (98%) found teacher feedback useful, while only 40% of students found peer feedback useful. However, 61% of students in the peer feedback group claimed that peer feedback is beneficial, suggesting that the experience of peer review had a positive influence on student perceptions of peer review.

The positive effects of peer comments were also found in Caulk's (1994) study, which randomly collected 28 EFL writings from three writing classes (intermediate to advanced level) in a German university. Students distributed their first drafts to the peers in their group and the teacher. Both the teacher and peers wrote comments separately, and the students rewrote their papers based on the comments. By comparing the quality and content of peer responses with teacher comments, Caulk found that 89% of the student comments included advice considered valid by the teacher, and 60% made appropriate suggestions not mentioned by the teacher. It was also found that not all teacher comments were mentioned in peer responses. The teacher tended to give overall and general comments while the students' comments tended to be specific and localized.

Tsui and Ng (2000) compared the effect of teacher versus peer comments among 27 Chinese EFL students and explored student perceptions about teacher and peer comments. Students received peer comments first, followed by teacher comments. The study found that the incorporation of teacher and peer comments varied greatly from student to student. Although students incorporated more teacher comments, students liked reading their peers' writings and most students valued peer feedback, with the exception of two students who incorporated few peer comments. Four roles for peer feedback were identified in follow-up interviews: enhancing a sense of audience, raising awareness of

weaknesses in their own writing, encouraging collaborative learning, and fostering ownership of text.

Questionnaire surveys have also been conducted to explore student perceptions of teacher and student review. Students' preference for teacher feedback over student feedback is reported in Zhang's (1995) questionnaire survey of 81 ESL students at various language proficiency levels. It was found that 93.7% of students preferred teacher feedback to non-teacher feedback, including peer feedback and self-feedback; and 60.5% of students preferred peer feedback to self-feedback. Zhang concluded that teacher feedback is more appealing than non-teacher feedback because of teachers' perceived expertise. However, as noted by Jacobs, Curtis, Braine and Huang (1998), Zhang forced students to make a choice between peer and teacher comments; peer and teacher comments should not be mutually exclusive. In a questionnaire survey among 121 Chinese EFL students, Jocobs et al. (1998) reported that 93% of participants wanted to receive peer feedback as one type of feedback. Indeed, in Zhang's (1995) study, 60.5% of students also valued peer feedback.

Mangelsdorf's (1992) questionnaire survey asked 40 advanced ESL students to reflect on their experiences with peer review. Most students (55%) found peer review beneficial, some (30%) held mixed attitudes, and only 15% of students were completely negative about it. The positive comments mainly focused on the effects of peer review on the improvement of content (68%) and organization (16%), while most of the negative comments reflected students' suspicion of their peers' ability to be qualified reviewers, based on their limited language skills. Considering that the purpose of implementing peer review in L2 classes is not to substitute teacher comments, but to provide an additional

source to help students re-adjust their thinking in the process of revising their writing, we are inclined to claim that the findings in the three questionnaire surveys reveal that L2 students perceive peer feedback as a favourable activity that can help them improve their target language.

2.2.2 Studies Investigating Student Interaction in Peer Review

Unlike the studies that compare teacher and peer comments or that compare peer and self-revision, as reviewed above, a number of studies have mainly focused on peer review, investigating different aspects of peer interaction and student revisions resulting from peer comments. Three aspects of interaction have been investigated: social dynamics, negotiation strategies, and discussion content. Nelson and Murphy's (1992a) study of four low-intermediate ESL students over six group interaction sessions found that students' idea units covered five content areas: study of language (73%), life general knowledge (3%), life personal knowledge (9%), procedural concerns (12%) and format issues (2.3%). The study also found that the group dynamic was not ideal because one of the students was constantly "attacking" the other students, and the other students reacted negatively to her comments.

Drawing on the same data set, Nelson and Murphy (1992b) investigated the revisions that students incorporated from peer feedback and the patterns of group dynamics. Unlike Connor and Asenavage (1994) and Paulus (1999), Nelson and Murphy identified positive effects of peer feedback. Students in their study found at least one of two major problems that the trained raters noted in most of the compositions (91%), and were able to identify

macro-level problems (e.g., organization and topic sentences), despite being less able to identify some inter-sentential features (e.g., coherence). The results also revealed that students were engaged in peer interactions and that this activity was helpful to their revision strategies. However, more revisions were found to be made in cooperative than in defensive interactions. In their analysis of the relationship between the interaction dynamics and the incorporation of peer comments, Nelson and Murphy (1993) identified three writer interaction patterns: interactive/cooperative, interactive/defensive, and non-interactive. It was found that interactive/cooperative writers were more likely than interactive/defensive and non-interactive writers to incorporate suggestions made in interaction into their final revisions.

In Mendonca and Johnson's (1994) study, 12 advanced ESL learners exchanged comments on their peers' first drafts in writing and then participated in a dyadic interaction session before producing their second drafts. Students employed various negotiation strategies in their interaction, including asking questions, offering explanations, giving suggestions, paraphrasing their peers' speech or writing, and correcting grammar mistakes. The analysis of written texts indicated that 53% of revisions resulted from peer comments. Some students also revised parts of their essays that were not discussed in peer review. It was also found that the students concentrated not only on local issues (e.g., word choice) but also on more global discourse issues (e.g., essay organization). The researchers conducted interviews with the students after they had completed the dyadic peer review session and again after they revised their essays. All students reported that they had benefited from the peer review activity and that peer review helped raise their awareness of the strengths and weaknesses in their own writing.

The findings of the study provide evidence for the value of peer review in L2 writing instruction.

Riley (1995) studied 12 recordings of three advanced students' interactions by analyzing negotiations according to reader and writer roles. It was found that readers guided the discussion, and that the same students, when assuming different reader/writer roles, used different negotiation strategies. Readers used comprehension check and suggestions most frequently, while writers used explanation. Riley also found that students' utterances were in the following categories: ideas (52.5%), language (16.5%), organization (12.8%), requirements (1.7%), procedures (3%), and away[2] (13%). Students selectively made revisions based on peer comments, and the extent of acceptance of comments varied from person to person. After a seven-week experience with peer review, students became more positive about this writing activity.

Lockhart and Ng (1995) examined the dyadic social dynamics of 54 EFL students (53 Chinese students and 1 Iranian student) from the perspective of reader stance. Four reader stance categories were identified: authoritative (n=9), interpretive (n=6), probing (n=9), and collaborative (n=3). The authoritative and interpretive readers were in an evaluative mode when interacting with writers. On the other hand, the probing and collaborative readers were in a discovery mode. The researchers also found that "[a]ll readers were cooperative with the writer, no matter which stance they assumed" (p. 616). The researchers selected eight dyads for further analysis, two of which represented each reader stance. Among 23 strategies identified, much of the negotiation consisted of giving

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[2] "Away" refers to the utterances that were not closely related to the papers.

suggestions, opinions, and information. The differences in using the strategies set the four readers apart. The analysis of discussion content revealed that the majority of interaction was around ideas (69.2%). Students also paid attention to some global issues of writing (i.e. organization, introduction, conclusion, and coherence) (5.1%), vocabulary (2.8%), and the writing process (1.2%). Very limited attention was directed to grammar, with only 1.2% to phrasing/wording, and 0.7% to style of language use.

De Guerrero and Villamil (1994) investigated the dyadic interaction of 54 intermediate Spanish-speaking ESL students during two peer review sessions. The findings showed that the majority of episodes (84%) were interactions between peers, as opposed to student-teacher episodes and non-interactive episodes. Most of the student-student episodes (83%) were collaborative rather than authoritative, and a majority of interactions were conducted in Spanish, the students' L1. In their study of functions of verbal interaction, Villamil and De Guerrero (1996) claimed that the social behaviour of peer interactions is "an extremely complex interactive process" (p. 51). In their further examination of the impact of 14 students' peer review on writing, Villamil and De Guerrero (1998) found that the students incorporated 74% of revisions made in the peer interaction sessions in their final drafts. In addition, like the students in Mendonca and Johnson (1994), they made many further revisions while revising. Results also showed that students were able to make grammar and content revisions. In their 2000 paper, De Guerrero and Villamil investigated mechanisms of 'scaffolded' peer interaction of two students in the same pool. The analysis of 16 episodes of interaction showed that it was not only the person providing feedback who scaffolded the writer's knowledge construction, but the writer also made revisions based on his/her own linguistic

knowledge in the process. The authors concluded that "scaffolding may be mutual rather than unidirectional" in L2 peer feedback (p. 51).

Another study that has examined peer review interaction is Suzuki (2006), which investigated the negotiation processes and revisions of 24 Japanese intermediate EFL learners who peer revised and self revised their writings. A within-group design was adopted by counterbalancing the revision conditions. All students wrote two topics individually; half of the students' writings on each topic were revised individually, and half were peer-reviewed in an interaction session. The results suggested that both revision conditions led to improved quality of writing, as measured by holistic scoring, accuracy, communicative quality, and number of words. Comparison of the effects of the two revision conditions revealed no significant difference in terms of accuracy and complexity, but self-revision led to greater fluency than peer review. However, the findings should be interpreted with caution because the second topic was easier than the first in terms of prompting complexity, and the two topics were not counter-balanced. The results of assessing the quality of each revision instance were mixed because of low inter-rater reliability. Student verbal interactions, based on think-aloud in self-revision and on peer interaction in peer review, were classified into three categories: language-related episodes (LREs), text-related episodes (TREs), and revision-related episodes (RREs). It was found that students in peer review talked about TREs (topics, content, and ideas of texts) most frequently (24%); however, they paid most attention (25%) to LREs (vocabulary/word choice) in individual revision. The researcher concluded that student interactions were different both qualitatively and quantitatively in self-revision and peer review.

2.2.3 Summary

Review of the research comparing teacher and peer review seems to yield inconclusive findings. Some studies have found L2 students reluctant to incorporate peer feedback in their revision. The Connor and Asenavage (1994) study reported limited incorporation of peer comments in students' revisions, i.e., only 5%. Similarly, Paulus (1999) found that 14% of students' revisions resulted from peer feedback. In their interviews, Nelson and Carson (1998) found that students perceived peer feedback as ineffective. On the other hand, other studies have supported the beneficial effects of peer review. Caulk (1994) found that 89% of student comments were valid, as evaluated by the teacher, and that 60% of student comments were not mentioned in the teacher comments. Nelson and Murphy (1992b) found that 91% of student comments were valuable based on trained raters' evaluations. Mendonca and Johnson (1994) found that peer comments resulted in over 53% of revisions, and Villamil and De Guerrero (1998) reported that students incorporated 74% of revisions made in the peer sessions.

However, closer scrutiny of study designs reveals that the seemingly contradictory findings of the studies suggest only that L2 learners prefer teacher comments to peer comments. In both the Connor and Asenavage (1994) and the Paulus (1999) studies, the students had opportunities to receive teacher and student comments, as well as comments from other sources. It should not be surprising to see that the students incorporated more teacher comments in their revisions than peer comments because the teachers are more knowledgeable in the target language and are often viewed as authority figures (see, for

example, Zhang, 1995; Carson & Nelson, 1994; Nelson & Carson, 1998). It is notable that when teacher feedback is not available, students provide valuable comments (Nelson & Murphy, 1992b); in one study, the majority of revision instances were traced to peer comments (Mendonca & Johnson, 1994), and in another study students incorporated the majority of peer comments (Villamil & De Guerrero, 1998). Students were able to identify macro-level problems and provide feedback on both local and global issues (Mendonca & Johnson, 1994; Nelson & Murphy; 1992b; Paulus, 1999; Villami & De Guerrero, 1998).

Students also reported that peer feedback was an effective complement to teacher feedback (e.g., Jocobs et al., 1998; Mangelsdorf, 1992; Mendonca & Johnson, 1994; Nelson & Murphy, 1992a, 1992b; Paulus, 1999; Riley, 1995; Tsui & Ng, 2000; Miao et al., 2006). Various benefits of using peer feedback have been identified. In general, peer feedback provides L2 students with a better opportunity to enhance the development of their writing ability and facilitate their second language acquisition (Tian, 2003).

Studies on student response interaction have revealed that interaction is a complex process. Three areas of interaction have been the foci of studies investigating peer review interaction: social dynamics, negotiation strategies, and discussion content. In terms of social dynamics in interaction, it is found that some students are cooperative and interactive, but some others are passive or even attack each other. Various factors affect social dynamics, such as students' language skills, their awareness of the purpose of the task, and their collaborator (De Guerrero & Villamil, 1994; Lockhart & Ng, 1995).

As for negotiation strategies, it is found that students employ various negotiation strategies in interaction, and the frequently used strategies include giving explanations

(especially opinions), giving suggestions or advice, and generating new information based on discussion and text (Lockhart & Ng, 1995; Mendonca & Johnson, 1994; Riley, 1995; Villamil & De Guerrero, 1996). Factors such as reader/writer roles (De Guerrero & Villamil, 1994; Mendonca & Johnson, 1994; Villamil & De Guerrero, 2000), the extent of shared knowledge (Mendonca & Johnson, 1994), and reader stances (Lockhart & Ng, 1995) may influence the choice of negotiation strategies in interaction.

With regard to discussion content, it is found that students discuss both global and local issues of writing during interaction. Less proficient students pay more attention to local issues (Nelson & Murphy, 1992a, 1992b; Paulus, 1999; Villami & De Guerrero, 1998; Suzuki, 2006), whereas more proficient students focus more on global issues (Lockhart & Ng, 1995; Mendonca & Johnson, 1994; Riley, 1995). However, research on the discussion content of language-related issues is either limited to the distinction between global and local issues (Mendonca & Johnson, 1994), or does not look at the details (Nelson & Murphy, 1992a). More areas of interaction need to be explored. For example, it is of interest how language use is dealt with in interaction. That is to say, the types of interaction occurring in peer review interaction help researchers understand what kind of language use students are likely to focus on, an areas of interaction that is addressed in one of the research questions in the current study.

Summing up the literature review on peer feedback, it is seen that research on peer review has focused extensively on exploring the benefits of such activity. However, most research has compared peer review with teacher feedback, or has explored the complexity of student interaction. Studies on discussion content in peer interaction is limited to global and local issues. Although students prefer teacher review when it is available, they

also acknowledge various benefits of peer review. Surprisingly, little research compares self-review and peer review when teacher review is unavailable (Cresswell, 2000; Suzuki, 2006), a situation that often occurs in L2 learning. Although teachers and peers are often treated as feedback providers in L2 writing classes, student writers themselves are indeed the ones who constantly provide feedback to their writings. To my knowledge, only one study (Suzuki, 2006) has examined the relationship between peer and self-revision. Thus, more research is needed to investigate the effects of peer review and self-revision on student writing; to explore the nature of discussion in interaction; and to examine students' perceptions of the two student self-monitored writing activities.

When teacher feedback is not available, co-writing, another student self-monitored writing activity, has been introduced to L2 classes because of its collaborative nature. However, this technique has not yet received enough attention from SLA researchers. No research has compared peer review and co-writing, or the latter two techniques to individual writing. The current research examines the roles of these three writing activities in L2 writing. The limited literature on co-writing is reviewed in the following section.

2.3 Research on Co-writing

Co-writing is a relatively new writing approach in language classes (Storch, 2005). It is gaining interest among L2 instructors and researchers alike (Nixon, 2007) because it invites students to collaborate and discuss writing throughout the whole process of writing. In addition, unlike peer review, where students provide feedback on each other's

drafts and only one student – the writer – has the ownership of the text, co-writing activities make both students responsible for the text they co-produce.

Research on the effectiveness of co-writing is inadequate, especially when it is compared with that on peer review. Existing studies fall into two categories: (1) studies comparing co-writing with individual writing in terms of quality, discussion content, and student perceptions, and (2) studies focusing on student interaction in the co-writing process and its relationship with the quality of student writing.

2.3.1 Studies Comparing Individual Writing and Co-writing

Three studies have investigated the roles of individual writing and co-writing (Storch, 1999, 2005; Nixon, 2007). Storch (1999) investigated the effect of collaboration on grammatical accuracy in 11 intermediate to advanced ESL students' completion of three tasks (a cloze task, a text-reconstruction task, and a short composition task), individually and collaboratively. The collaborative short composition task is defined as the co-writing task in the current study. In the co-writing task, it was found that students produced more grammatically accurate, but shorter and less complex, writings when working collaboratively than when working individually. However, since the focus of the study was on grammatical accuracy, other important indices for assessing writing quality, such as fluency and lexical complexity, were not analyzed. It is also notable that the amount of time students spent finishing the tasks collaboratively was not controlled. Student used double the amount of time in the collaborative condition compared to the individual condition.

Storch (2005) compared co-writing and individual writing when 23 ESL students, nine pairs and five individuals, wrote a short paragraph. It was found that the co-writing products were shorter than individual writings, but better in terms of task fulfillment, grammatical accuracy, and complexity. However, the differences were not statistically significant. The analysis of the verbal interactions of the 18 co-writing students showed that students spent most time on the writing phase rather than on the planning or revising phases, and more time in generating ideas (53%) and engaging in LREs (25%) than in discussing structure (5%) or interpreting the graph (6%). In the interview with co-writing students, 16 of 18 had a positive attitude towards co-writing. Students favoured co-writing because it provided them with an opportunity to learn different ideas, different ways to express their ideas, and opportunities to improve their accuracy and vocabulary. Some students also described co-writing as a fun activity. However, some students expressed concern that they were not linguistically competent, that criticizing their partner could result in hurt feelings, and that writing is supposed to be individual.

Nixon (2007) investigated the quality of writing among 24 advanced Thai EFL students who completed one argumentative essay collaboratively and another one independently. The tasks and the writing conditions were counterbalanced. Similar to the findings in Storch (2005), no statistical difference was found between the co-writing and individual tasks. Nixon attributed this finding to the restricted time given to the co-writing condition. Students' interactions were segmented into LREs, including lexis, grammar and mechanics, and OREs (organizational related episodes), including paragraphs and rhetorical structure. It was found that LREs had the potential for scaffolding and that most of the LREs were initiated by explanation/confirmation

requests (58%) and suggestions (39%). In the interview, most students preferred the co-writing to the independent writing activity and believed that they completed a better essay with their partners than when they worked alone, although the analysis of the writing products did not show any significant difference. This unclear finding calls for more research.

2.3.2 Studies Investigating Student Interaction in Co-writing

In her study with three pairs of ESL students co-writing a short paragraph report, Storch (2001) found that dyads adopted different stances in interaction: two dyads adopted a collaborative, and one a non-collaborative, orientation. Linguistic and interactional features of these two types of interactions were identified. The collaborative dyads used more first-person plural pronouns and few directives, text was co-constructed, and there was evidence of scaffolding. However, the non-collaborative dyads tended to use more first-person singular and second-person pronouns, text was constructed with little negotiation, and interaction tended to be non-interactive. It was also found that the quality of writing was related to student interaction dynamics. The collaborative dyads produced more accurate and fluent texts than the non-collaborative dyad, but the complexity of the texts was reduced. However, since the language proficiency of one student in each collaborative dyad was high, Storch suggested further research to examine factors affecting the quality of co-writing products.

Storch (2002, 2003) investigated dynamic patterns of pair work when 10 pairs of intermediate ESL students were involved in three tasks (a short composition, an editing

task, and a text reconstruction task) in a 13-week longitudinal study. The analysis of the interactions found four patterns representing the role relationships of the students: collaborative, dominant/dominant, dominant/passive, and expert/novice. The findings also showed that the collaborative pattern predominated in the data and that the different patterns remained stable regardless of the task or passage of time. When the relationship between dyadic patterns and L2 development was analyzed based on the three writing tasks students completed together and an individual writing at the end of study, the findings suggested that the collaborative pairs showed more evidence of language development than the non-collaborative pairs. However, instances of transfer of incorrect knowledge were also identified.

2.3.3 Summary

When co-writing is compared with individual writing, study results reveal no evidence that one writing condition is better than the other (Nixon, 2007; Storch, 1999, 2005), although Storch (1999, 2005) found a tendency for students to produce more grammatically accurate and complex writings when they write together. Interestingly, although no significant difference is found in students' writing performance in the two writing conditions, most students in the follow-up interviews perceive co-writing as an activity more beneficial to their writing development (Nixon, 2007; Storch, 2005). Thus, more research is needed to investigate the roles of co-writing and individual writing in L2 students' writing development.

Studies on student verbal interaction in the co-writing process mainly focus on dynamic patterns (Storch, 2001, 2002, 2003). The findings suggest that most students were engaged and collaborative in the activity, but some interactions were non-collaborative. This finding is similar to what is found in studies on peer review, i.e., although different dynamic patterns exist in student interaction, most interactions were collaborative. It was also found that collaborative interactions led to a higher quality of writing in terms of accuracy and fluency, but not complexity, and to more transfer of language in students' subsequent writing.

Overall, the limited research on co-writing calls for additional studies to further investigate this field. Additional studies should also consider different writing genres, different language proficiency levels, and different target languages. In Storch's studies, students were asked to write a short paragraph commentary of writing or of a graph report, and in Nixon's study, students worked on argumentative essays. In all studies on co-writing, students were at an intermediate or higher language proficiency level. Thus, it is necessary to look into how beginner students interact when they work on less cognitively challenging tasks, such as writing a picture narrative. Moreover, Storch's studies were conducted in an ESL setting, and Nixon's in an EFL setting. More research is needed to look into writing in languages other than English. With the increasing demand for, and interest in, learning Chinese as a second/foreign language, studies on learning Chinese-as-a-Second language are needed to draw pedagogical implications for both CFL instructors and learners, as well as to make an important contribution to L2 research in general, especially because research on Chinese L2 writing is still limited.

In addition, in studies comparing collaborative writing and independent writing without teacher feedback, previous research suggests that collaborative writing is no better than individual writing in terms of student writing performance (Nixon, 2007; Storch, 2005; Suzuki, 2006), although collaborative writing products tend to be slightly better, and only one study shows that co-writing products are more grammatical than individual writing (Storch, 1999). However, as we know, writing quality cannot be measured by one single index of grammatical accuracy; thus, more comprehensive measures must be taken to investigate the quality of student writing performance under different writing conditions. Furthermore, if it is true that collaborative writing is no better than individual writing, this finding will arouse great curiosity and cast doubt on the reliability of prevailing theories and on the value of the current practice of collaboration in L2 writing classes. Given the great efforts that teachers and students make to work together in any collaborative writing activity, we may wonder if the efforts are worthwhile. If students working independently perform as well as students working collaboratively, there may be no need for them to collaborate before getting feedback from teachers. Individual writing with multiple drafts may satisfy the need for student writing development. However, since previous research in this area is very limited, more research is necessary.

2.4 Current Study

The current study addresses the research gaps in previous studies. As mentioned earlier, little research has compared peer review and self-revision (Cresswell, 2000; Suzuki,

2006); co-writing has not received enough attention in SLA research (Nixon, 2007; Storch, 2005); and no research has compared peer review and co-writing, including their effects on student writing, the nature of student verbal interaction in the two collaborative writing activities, and student perceptions of these writing conditions.

In studies that have investigated writing quality of peer review or co-writing products, only certain aspects of writing quality have been attended to, such as complexity or accuracy (e.g., Storch, 1999; Storch, 2005). More often studies employed holistic or analytical scorings (e.g., Caulk, 1994; Hedgcock & Lefkowitz, 1992; Nixon, 2007; Suzuki, 2006) rather than the measures of fluency, complexity, and accuracy that are believed to present a more comprehensive reflection of learner language (Ellis & Barkhuizen, 2005) and have been widely used to analyze learner language in both oral and written production (Ellis & Barkhuizen, 2005; Ellis & Yuan, 2004; Way, Joiner & Seaman, 2000; Wolfe-Quintero, Inagaki & Kim, 1998).

The aim of the current study is to examine the effectiveness of peer review and co-writing among adult Chinese L2 students with regard to fluency, accuracy and complexity. The study will also explore the nature of student verbal interaction during collaboration and investigate students' perceptions of the effectiveness of individual writing, co-writing, and peer review.

2.4.1 Research Questions

To address the above-noted objectives, the research raises the following three main research questions.

1) What are the effects of peer review, co-writing, and individual writing on CFL students' quality of writing with respect to fluency, complexity, and accuracy?

2) What kind of verbal interaction occurs when students discuss their writings in peer review versus co-writing?

3) How do students perceive individual writing, co-writing, and peer review?

CHAPTER THREE – RESEARCH METHODOLOGY

This chapter describes the methodology used in the study. Section 3.1 describes the study design and explains the counterbalancing of the writing tasks and writing conditions. Section 3.2 introduces the participants based on the course curriculum and the data collected in a background questionnaire. Section 3.3 provides an account of the procedure, including the writing tasks, the writing conditions, the questionnaires, two pilot studies, the software used and the data collection timeline.

3.1 Research Design

The study employed a within-group design with three writing tasks and three writing conditions: a peer review condition, a co-writing condition, and an individual writing condition. Three tasks were administered so that each student would get a chance to write in each of the three conditions. Because students worked in dyads in two collaborative conditions, the total number of students required was 18 (3 x 3 x 2 = 18). In addition to a background questionnaire, four questionnaires were administered at different times, asking students to describe and comment on their writing experience. Two pilot studies were conducted to test the study design feasibility, and major changes were made in the research design in the main study based on the results of the pilot studies.

The conditions and the tasks were counterbalanced to eliminate the risk of carry-over task effects. Counterbalancing the conditions and the tasks reduced the likelihood that students might improve writing performance by getting familiar with the tasks through

practice over a period of time, especially when they were also exposed to classroom instruction. To counterbalance the writing conditions, six of the 18 students wrote in each of the three conditions in each of three weeks, and the condition for the same student was different every week. Similarly, the three writing tasks were counterbalanced. Six students completed the same task every week, and different ones in the other two weeks. The study design is illustrated in Table 3.1. Every week, six students wrote in the peer review condition, six in the co-writing condition, and six in the individual condition. Two of the six students in each condition wrote on one of the three tasks. That is, two students wrote on one of the three tasks under a different condition in each week. In the other two weeks, the task and the condition for the two students were different.

Table 3.1 Study Design

S*	Peer Review			Co-writing			Individual Writing		
	Week 1	Week 2	Week 3	Week 1	Week 2	Week 3	Week 1	Week 2	Week 3
1	Task 1				Task 2				Task 3
2	Task 1				Task 2				Task 3
3			Task 3	Task 1				Task 2	
4			Task 3	Task 1				Task 2	
5		Task 2				Task 3	Task 1		
6		Task 2				Task 3	Task 1		
7	Task 2				Task 3				Task 1
8	Task 2				Task 3				Task 1
9			Task 1	Task 2				Task 3	
10			Task 1	Task 2				Task 3	
11		Task 3				Task 1	Task 2		
12		Task 3				Task 1	Task 2		
13	Task 3				Task 1				Task 2
14	Task 3				Task 1				Task 2
15			Task 2	Task 3				Task 1	
16			Task 2	Task 3				Task 1	
17		Task 1				Task 2	Task 3		
18		Task 1				Task 2	Task 3		
T**	6	6	6	6	6	6	6	6	6

*S: Student
**T: Total

3.2 Participants

Eighteen adult Chinese L2 learners volunteered for the study. These students were from an intact class to avoid any instruction effect. The course was a second-level Chinese course at the University of Victoria, a continuation of a beginner course designed for students with little or no prior knowledge of Chinese. Although some heritage students had learned Chinese formally before, they were still placed in the beginner-level class because their high school provincial examination scores were low or because their formal education was very limited. All students in this second-level class completed around 90 hours of instruction in the beginner course, and received a minimum grade of B. Thus, their language proficiency level is regarded as high-beginner.

This high-beginner course and the beginner course were two intensive Chinese language courses offered at the University of Victoria. Students met three times a week in class and once a week in a tutorial session over a 13-week semester. The class lasted for two hours, and the tutorial time was 50 minutes in length. The textbook used was one in a series of textbooks entitled *Contemporary Chinese* by Wu, Zhongwei (2003). Book 1 was used for the beginner level, and Book 2 for the high-beginner level, the level for the current study. Book 2 included 12 lessons. Each lesson consisted of two texts around the same theme, written in the format of a conversation. Books 3 and 4 were used for intermediate and advanced levels, respectively.

There were three concurrent sections at the high-beginner level, taught by three different instructors. Section one used a different textbook – *Chinese Primer*, which

employs traditional Chinese characters,[3] and Gwoyeu Romatzyh (GR), a sound notification system that differs from the more commonly used system, pinyin. Thus, these students were not considered for the study. Sections two and three used *Contemporary Chinese*, simplified Chinese characters, and pinyin. After consulting with the instructor of section two, I was informed that students in section two did not frequently practice writing on computers, an essential requirement in the current study. Students in section three, in which the current researcher was the instructor, wrote frequently and handed in their writings electronically every week. By the time the study was conducted, there was no need for any extra training to familiarize the students with the typing software used in the study. Therefore, to control participant population variables, only students in section three were recruited for this study. Thus, all participants would be familiar with similar vocabulary from the same textbook, would use the same sound notification system so that the same character input software could be used in the study, would have similar knowledge of pinyin input software, and would have the same instructor.

Eighteen students in the 21-student class were participants in the study. Although all 21 students volunteered to participate in the study, one of the students was excluded from the study at the outset because he joined in an exchange program and would leave the country before the study ended. Another two students completed only the first task; one of them fell sick and did not complete the term. Thus, the data of their single completed writing task were excluded from the analysis. This process reduced the number of the

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[3] There are two writing systems in Chinese: traditional characters and simplified characters. Traditional characters are mainly used in Taiwan as well as in some overseas Chinese communities, and have a dense stroke composition. Simplified characters, used in the People's Republic of China and in Singapore, stem from literacy reform in the 1950s that reduced the number of strokes in traditional characters.

participants to 18 (21 – 3 = 18), which met the required number of participants in the study design.

The students varied in age from 19 to 27; the majority (94.4%) were in the age range of 19 to 23, and only one student was 27. There were 11 female students (61.1%) and 7 male students (38.9%). All students were undergraduates and in different years of study, with the majority being in second year (55.6%). They came from a range of disciplines, the two most common being Economics and Commerce/Business. Table 3.2 presents the student background information with pseudo names.

Table 3.2 Student Background

Pair	Name	Age	Gender*	Year of study	Field of study	L1	Dominant language	Heritage student
1	Tina	19	F	2	Applied Linguistics	Cantonese	English	Yes
	Mika	22	F	4	History in Art	Japanese	Japanese	No
2	Elena	19	F	2	Economics	English	English	Yes
	Sung	22	M	2	Economics	Korean	/	No
3	Daeng	19	M	2	Pre-commerce	Thai	English	Yes
	Keiko	20	F	2	Economics	Japanese	English	No
4	Aki	22	M	3	Humanities	Japanese	Japanese	No
	Cathy	22	F	2	Geography	English	English	No
5	Rena	27	F	5	Humanities	English	English	No
	Mark	20	M	2	Economics	English	English	Yes
6	Kyoko	20	F	1	Psychology	Japanese	Japanese	No
	Sara	19	F	2	Commerce	Cantonese	English	Yes
7	Yuko	23	F	3	Psychology	Japanese	Japanese	No
	Rak	19	M	3	Political Science	Thai	Thai/ English	No
8	Sue	19	F	2	Commerce/ Economics	English	English	Yes
	Tim	22	M	1	International Business	English	English	No
9	Helen	22	F	3	Pacific and Asian Studies	English	English	No
	Rick	22	M	2	Business Commerce	Cantonese /Spanish	English	Yes

*Gender: F refers to Female; M refers to Male.

Students were from different language backgrounds, representing the population type of most CFL classes in North America. Among the 18 students, seven were heritage students;[4] four spoke only English and were learning Chinese; and three spoke one or two other languages as well, meaning Chinese was their third or fourth language. None of them had experience of learning Chinese in a Chinese-speaking country. Their first languages included English (n = 7), Japanese (n = 5), Thai (n = 2), Cantonese (n = 2), Korean (n = 1), and both Cantonese and Spanish (n = 1). However, the majority of students (n = 12) claimed English as their dominant language. Four students spoke Japanese as their dominant language, one student spoke both Thai and English equally well, and one student did not provide this information.

The discrepancy between students' L1 and their dominant language may be explained by a few factors. Some students' families immigrated to Canada when they were at an early age; some were born in Canada and spoke their parents' language as a home language; and some international students came to Canada when they went to middle school. These students had begun to use English dominantly since they started schooling and felt more comfortable with English than with their first language.

Students were paired randomly. As Table 3.2 shows, the random pairing generated pairs where no heritage student or Japanese student worked with another student from the same background. The seven male students were paired with female students, and two other pairs consisted of female students only.

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[4] In the current study, "heritage students" refers to participants with one or both parents who speak Chinese, or a dialect of Chinese, as their first language.

The questionnaire revealed that students were learning Chinese for various purposes, with some students providing more than one reason. The most frequently mentioned purposes were getting prepared for better careers in the future (n = 8), communicating with Chinese or Chinese friends (n = 5), and being interested in Chinese culture (n = 4). Two students wanted to learn Chinese because they found Chinese an interesting and fun language. Two students wanted to learn another language and picked Chinese. One student mentioned that she wanted to challenge herself by learning Chinese, and one wanted to meet a Chinese girlfriend. Finally, one student mentioned that she was very eager to learn more about her heritage language and culture.

In terms of working style, six students (33.3%) preferred to work individually, ten students (55.6%) collaboratively, and two students (11.1%) mentioned liking both individual and collaborative working. Those preferring individual work mentioned that working alone allowed them to work at their own pace and work more efficiently, to avoid any pressure or embarrassment when working with a partner, and to make decisions on their own. One student preferred to work individually because she found it hard to depend on others. On the other hand, those who preferred to work collaboratively claimed that working together made it possible to share ideas, to put ideas and writing strengths together, and to seek and/or provide help. In this way, they could get more practice and gain more understanding of what they were studying, and their writing process would be more effective. Meanwhile, their writing products would be better, be more grammatical, and achieve greater clarity. For the two students who did not have any particular preference between individual and collaborative working conditions, one student mentioned that it was desirable to keep a balance between the two working

conditions because "some independent study is needed to make collaboration more effective, but studying alone always is not so good either."

When asked about their strengths in Chinese writing, 10 students identified characters as their strength, including five out of seven Chinese heritage students, all four Japanese students, and one English L1 student. Other strengths students reported in their Chinese writing included sentence structures (n=3), pinyin (n=2), grammar (n=1), vocabulary (n=1), creative writing (n=1), and eagerness to learn Chinese (n=1). Four students also thought they had no strength in Chinese writing.[5]

In terms of weaknesses in Chinese writing, half of the students (n=9) said their grammar was not good, and one-third (n=6) claimed that they lacked the vocabulary to express their ideas. Four students mentioned that they did not have a good grasp of sentence structures; two students were concerned that they could not recall characters when they wrote; one student mentioned that s/he was not good at the following four aspects: conjunctions, punctuation, pinyin, or stroke order.

3.3 Procedure

Data collection took place over six weeks. Data collected included student writings in three writing conditions, videorecorded screen activities, videorecorded interactions, and five questionnaires. Before describing the software used in data collection and the

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[5] Some students suggested more than one strength and weakness in their Chinese writing. Consequently, the total number of strengths and of weaknesses exceeds 18, the number of students in the study.

timeline for data collection, this section first describes the writing tasks, the writing conditions, the questionnaires, as well as two pilot studies.

3.3.1 Writing Tasks

The three writing tasks were three narrative writings, each based on a set of six pictures. The students were asked to write at least three sentences to describe each picture to ensure that the writing they composed reached the length adequate for analysis. L1 literature shows that narrative writing requires less planning and a lower level of abstraction than other writing modes because it follows a chronological order (Matsuhashi, 1981). Narrative writing was chosen for writing tasks so that the students would concentrate on writing using the target language rather than spending too much time developing cognitively demanding arguments or reaching consensus if they held different positions, a complaint noted by the students in Nixon (2007). Meanwhile, narrative writing with visual input was chosen because picture narrative is demanding enough for language learners to "stretch their linguistic resources" (Ellis & Yuan, 2004, p. 69), and is often used in L2 writing research (e.g., Ellis & Yuan, 2004; Guo & Liu, 1997; Ishikawa, 1995; Swain & Lapkin, 1998, 2000; Wang & Wen, 2002).

In the first picture set, a male student, Ma Li, gets up at 6:00 a.m., has breakfast at 6:30 a.m., bikes to school at 8:00 a.m., has a Chinese class at 10:00 a.m., plays basketball at 5:00 p.m., and has dinner with a girl at 6:50 p.m. In the second picture set, a female student, Wang Ying, waits for a bus at a bus stop, shops with a girlfriend, has a birthday party, watches TV at home, has a stomach ache, and sees a doctor. In the third picture set,

Ma Li studies Chinese, has coffee in a coffee shop surrounded by people talking about China, reads books about China in a library or a bookstore, borrows a map of China from a friend, takes a plane to China, and takes a lot of pictures in China.

The narrative writings were completed in Chinese; thus, it is important to introduce the Chinese writing system here because it helps in interpreting the data and data analysis. Chinese is a logographic writing system with a 5000-year history. The symbols, which are often referred to as logographs or logograms, are called 'zì' (字，'characters') in Chinese. Each character represents a linguistic unit (morpheme) and a single segment (syllable) of speech. The official spoken language of Mandarin Chinese is made up of around 400 monosyllables, with up to four tones used to help distinguish them (Lin, 2001; Wu, 2003), so there are multiple homophones (同音异形字).

In contrast to English spelling, which uses linear strings of letters and has very few two-letter words, the majority of Chinese words are combinations of two syllables (Lin, 2001), with each syllable representing a morpheme or a character, although some free-standing morphemes are also classified as words. In Chinese, some long words are like phrases, since a modern Chinese word can consist of up to eight characters (Hoosain, 1992; Wu, 2003). These multi-character words reduce the challenges associated with Chinese homophones. Another characteristic of the Chinese writing system is that the characters are never altered by any added inflections. For example, the same character can represent 'write', 'writes', 'wrote', or 'written'.

Because the logographic writing system represents ideas and not sounds, historically only educated people read and wrote Chinese characters, and the literacy level was low

across the country. Thus, in the past, there have been several intensive Chinese literacy campaigns, such as the invention of sound notification systems, among them the development of pinyin, a Romanized alphabetical system established in 1958 and widely used to facilitate the learning of Chinese characters ever since. Pinyin is often written in a small font above each character when necessary, such as in children's books. Pinyin is now used as the initial learning medium in Chinese elementary schools, for Chinese L2 learners, and for Chinese native speakers to correctly pronounce a character that they encounter for the first time. In general, Chinese written texts are in characters only; however, a Chinese language learning text may have two components: a character text and a pinyin text above each character or after the character text.

The writing tasks were completed on computers. Computer access is necessary in the study because the Chinese typing software reduced the unequal challenge that students with different language backgrounds would face if they had to write Chinese on paper. Some students in this study spoke English as L1 and had little or no exposure to Chinese before taking Chinese courses at the University of Victoria. However, some students in this study were heritage students who had been exposed to Chinese character learning when they were young, and some were Japanese speakers, who were familiar with Japanese kanji, a script derived from Chinese characters. Also, one Korean student had some exposure to Chinese in elementary school in Korea. Since the Chinese logographic writing system differs profoundly from the English alphabetic writing system, asking students with different language backgrounds to write characters would bias the study results. Students with little character writing practice would have to struggle with writing each stoke of a character, and would no longer be able to direct their attention to narrative

writing. Students with more exposure to characters would have less trouble with characters. The advantage of Chinese heritage, Japanese, and Korean students in character production was confirmed in a student academic background questionnaire reported in section 3.3 above.

In addition, using computers in the study did not detract from the focus of the study because students had to choose the right characters from the choices presented by the software when they typed the phonetic cues. As mentioned earlier, there are many homophones for any given phonetic cue. Students faced the challenge of choosing the right spelling and using appropriate writing mechanics. Thus, a quiet room with computer access was ideal for the study.

3.3.2 Writing Conditions

Students composed a written version of a picture narrative in each of the three writing conditions. The time set for completing each stage of writing was determined in two pilot studies. In the peer review condition, students were given 10 minutes to study the pictures individually, 30 minutes to write a story based on the pictures individually, and 15 minutes to revise each piece of writing through peer feedback in an oral interaction session. In the co-writing condition, students completed all three stages in dyads; namely, they were given 10 minutes to study and to discuss the pictures with a partner, 30 minutes to write a story together, and 15 minutes to revise it together. In the individual writing condition, students were given 10 minutes to study the pictures individually, 30 minutes to write a story about the pictures individually, and 15 minutes to revise it individually.

As a result, each stage of the writing process was completed in the same amount of time, regardless of the writing condition. That is, each writing product was completed in a maximum of 55 minutes: 10 minutes for brainstorming, 30 minutes for writing, and 15 minutes for revising.

Students worked with the same partner in both peer review and co-writing conditions and wrote at the same time on the same day when they worked individually for the sake of controlling the time frame between tasks. The students were randomly paired and the pairing was consistent throughout the tasks.

Altogether, 45 pieces of writing were collected: 18 pieces written in the individual writing condition, 18 in the peer-editing condition, and 9 in the co-writing condition (in the latter condition, 9 pairs of students produced one joint narrative). Technically, there should be 15 pieces of student writing on each of the three topics. However, because the student roles were assigned before writing started, and one of the initial 20 participants was sick and only completed the first of the three tasks, the unexpected drop-out resulted in an unequal number of student writings on the three topics; that is, there were 15 pieces on the first narrative, 14 on the second narrative, and 16 on the third narrative. However, each student completed his or her three writings in the three writing conditions.

3.3.3 Questionnaires

Because students were studying at a university with English as the instructional medium and they were at a high-beginner level in their study of Chinese, the questionnaires were designed in English to retrieve more accurate and more detailed information. When

designing the questionnaires, I studied the literature on questionnaire surveys investigating students' attitudes when they carried out different writing tasks and consulted Nixon (2007) and Storch (2002). Further developing from the literature, I also took into consideration the research objectives of the current study in the questionnaire design. The question items in the questionnaires were modified based on the findings of the pilot studies.

Altogether, five questionnaires were distributed. At the beginning of the main study, a student background questionnaire was collected. Three response questionnaires (Appendix 3) consisted of open-ended questions only and were collected immediately at the end of each writing task. One preference questionnaire (Appendix 4) comprised both open-ended questions and a ranking scale component and was distributed after the students completed all three tasks in all three conditions.

3.3.4 Pilot Studies

Initially, only one pilot study was conducted to examine the feasibility of the study design, including tasks, task instructions, assessment measures, and questionnaires. Because major changes to the above-mentioned areas were made after the first pilot study, a second pilot study was conducted to examine the revised research instruments.

In the first pilot study, three pairs of volunteering students at the intermediate language proficiency level (one level higher than that of the participants in the main study) completed three narrative writing tasks in three weeks, with the writing conditions

counterbalanced. After they completed each task, the students were briefly interviewed to identify any potential problems in the study design.

A number of changes were made after the first pilot study. The biggest decision was to change the picture sets used for the writing tasks. The initial plan to use picture sets chosen from Plauen's comics *Vater und Sohn* (Father and Son) was discarded after the second week of the pilot study. Three sets of pictures were chosen from two comic books of *Vater und Sohn* based on three criteria: (1) each picture set would consist of six pictures, (2) the story could be told using grammar that had been taught by the time of the study, and (3) the story could be told using vocabulary that had been taught by the time of the study. Some supplementary words were provided at the bottom of each set of pictures after consultation with two experienced Chinese instructors. However, once the pilot study began, it soon became apparent that these picture sets were not appropriate for the study. The vocabulary to be used was very specific. Even with the supplementary words given below the pictures, in the interview the students reported that they felt a lack of knowledge about the usage of these words. In addition, since the students were used to conversation-formatted texts, some of them wrote a conversation between father and son to describe the pictures, rather than a written prose-formatted narrative. These results highlighted the need to make the task instruction clearer.

In the third week of the pilot study, I changed the picture set. I assembled six pictures from the textbook into a sequence of events that a student might complete in a day. No supplementary words were provided because the students were supposed to have described the pictures as oral practice in class. My observation of the students' writing process showed that all students seemed to enjoy this task more, and they also reported in

the interview that they could focus more on the development of the story, rather than getting frustrated at the unknown vocabulary needed to complete the narrative in the first two writing tasks.

In addition to changing the pictures, I was also able to estimate how much time the participants in the main study might need in each stage of writing. Students were told to take as much time as they needed to write and to revise, two initial stages that were planned to be included in the writing task. However, in the first week, the pair in the co-writing condition spent 70 minutes writing and 6 minutes revising. An examination of their interaction revealed that at the beginning and during the writing, the students spent a lot of time discussing what to include in describing each picture. This finding suggested that, especially for the co-writing condition, a brainstorming stage might be needed for students to reach consensus about what to write, so that they could truly focus on writing during the time allocated for writing. In the second week, a brainstorming stage was incorporated. It was found that students spent up to eight minutes brainstorming. This observation again suggested that the picture narrative task was challenging enough to stretch participants' linguistic knowledge and competencies to complete the task. Thus, a ten-minute brainstorming stage was included in later tasks.

After a brainstorming stage was incorporated, students spent an average of 44 minutes on the second writing task and 35.6 minutes on the third. Considering that the pictures to be used in the main study would be similar to those in the third task, it was decided that in the second pilot study, 35 minutes would be allocated to the writing stage. The revision time varied from 5 to 16 minutes, with an average of 9.5 minutes. To ensure

students would have adequate time for revision, it was decided that the revision stage would take 15 minutes in the second pilot study.

In the second pilot study, two volunteering students were at the same language proficiency level as the participants in the main study. They spent one day completing all three tasks, using three new picture sets and following modified task instructions. They had a coffee break and a lunch break between tasks, with coffee and lunch provided.

The new picture sets comprised three sets of event sequences, for a total of 18 events (3 x 6= 18), as described in section 3.3.1 above. Care was taken to select 18 events covered in the first six lessons of the textbook, which students had finished by the time of data collection in the main study. The 18 events were divided into three sets of event sequences, and were drawn by a paid student who was not a learner of Chinese. These pictures were used as writing task prompts in the second pilot study.

In week 7, the two volunteering students completed the tasks one by one, under three conditions and following three stages: a 10-minute brainstorming stage, a 35-minute writing stage, and a 15-minute revising stage. They were able to write a narrative based on each picture set, and the time spent on writing ranged from 24.3 minutes to 35.5 minutes, with an average of 30.7 minutes. Thus, a new time frame was developed for the main study, i.e., 10 minutes for brainstorming, 30 minutes for writing, and 15 minutes for revising.

Modifications were made to the questionnaires based on the students' comments. In addition, all students in the two pilot studies confirmed that writing on computer lessened the pressure of writing in characters, and that they would not have written as much if they had been asked to complete the task on paper. The two pilot studies helped me develop

the picture sets, the task instructions (Appendix 1), a personal profile and academic background questionnaire (Appendix 2), three response questionnaires (Appendix 3), and a preference questionnaire (Appendix 4). Analysis of students' interactions and writings in the pilot studies also provided a guideline on how to approach the data, the details of which will be provided later in the data transcription and the data analysis sections.

3.3.5 Software Used in Data Collection

Two software programs were used in the data collection procedure. One was a Chinese typing software program to input Chinese characters in a computer; the other was a screen catch software program *CamStudio*, which captured every movement on a computer screen so that all changes made in the process of writing were recorded.

Computerized Chinese character input systems are fairly easy to use and involve regular keyboard input. Two main input techniques are pinyin input and character code input (keyboard-based codes representing Chinese character components or strokes) (Wu, 2003). Since the students in this study were familiar with pinyin and had been taught how to use pinyin input, and because special training is required to get used to character code input, it was decided that students would use pinyin input in the study. Of the many often-used options for pinyin input, the study adopted *Quanpin*, which requires that students spell out all letters in pinyin to get the homophones and select the right character from the prompts. Students were familiar with this input software because they were introduced to it and encouraged to use it in finishing their course work throughout their

Chinese study. Since they were still at a fairly early stage of Chinese learning, learning pinyin was one of their learning objectives.

It might be argued that computer writing may have forced some students to underperform. For example, some students may not have been able to input a character not because they did not know the character, but because they did not know the pronunciation of the character. It is true that pinyin input is not the same as character writing on paper because pinyin input draws on phonetic cues to generate choices of characters. Yet, research shows a strong correlation between knowing the meaning of a Chinese word and knowing its pronunciation (Everson, 1998). In addition, it could happen to any student not to remember how to pronounce a character. Thus, I maintain that this concern is negligible, especially when compared with the unequal challenge faced by students with different orthography backgrounds. Also, in the student academic background questionnaire, while all students mentioned that they wrote Chinese on computer only once a week, the majority of students (61.1%) preferred to write Chinese using computers, and only 33.3% claimed that they preferred to write on paper. One student (5.6%) did not provide any information on this question.

To record student writing on screen, a software program *CamStudio* was installed on the computers used for this study. The software captured every movement on screen, including the development of a text, the prompts generated by the phonetic cues, cursor movements, and any changes students made while writing and revising. By using this recording software, I could easily follow students' discussions when they collaborated and finished their writings. For example, when they mentioned 'five' to suggest it was the fifth character to choose from the prompt list, I could see what their decision was.

Similarly, when they used words such as ‘this’, ‘that’ or ‘here’, I could see which part of the text they were referring to through the movement of the cursor. This information was helpful in transcribing student interaction and in interpreting student negotiations.

3.3.6 Data Collection Timeline

The main study took place from week six to week twelve of the semester so that the students would have more exposure to the target language and would be familiar with their peers by the time the study began. To minimize any potential effect on students’ language learning, the main study was conducted outside of class time and on a voluntary participation basis.

In week six, a third party recruiter (an MA student in linguistics) announced the project and its aims in class, invited volunteers, and handed out a consent form (Appendix 5) to all students. Students were explicitly informed that their participation was completely voluntary and that their performance would not impact their course grades because all data collected (i.e., their writings, their interactions, and their completed questionnaires) would not be analyzed and the names of the participants would not be given to me until the course grades were submitted. Although all 21 students in the class agreed to participant, the data of only 18 students were analyzed, as mentioned earlier.

In week eight, students were randomly paired, and I was informed that all students agreed to participate in the study voluntarily. All students filled out a personal profile and academic background questionnaire in class.

In weeks 9 to 11, students wrote one of the three tasks each week following the study design, see section 3.2.1. The 18 participants (initially, there were 20 students) were invited to complete the study tasks in pairs at a time arranged with the researcher in an office, where they had access to two laptops installed with Chinese typing software and the screen capturing software. The writing instructions for the three writing conditions were distributed to students along with the picture sets before they started. For the co-writing tasks, each pair of students was given only one set of pictures and a copy of the task instructions. The students were told that they could use either English or Chinese when they interacted with their partners. They were reminded of the time left to complete each stage of the task, once when there were five minutes left, and once when there was one minute left, provided that they did not finish the task before the given time frame. Their interaction with partners was videorecorded. The writings and the revised writings were saved separately on computer for analysis. After writing each week, students filled out a short open-ended questionnaire about their response on the task. In week 12, one week after the third writing task, the students filled out a preference questionnaire about their attitudes of the three writing tasks in class. The response questionnaires and the preference questionnaire were conducted to explore student perceptions on the three writing tasks.

Table 3.3 summarizes the timeline for the data collection procedure in the main study.

Table 3.3 Data collection Timeline

Time	Task
Week 6	Recruitment Consent form
Week 8	Random pairing Background questionnaire
Week 9	1st writing 1st immediate response questionnaire
Week 10	2nd writing 2nd immediate response questionnaire
Week 11	3rd writing 3rd immediate response questionnaire
Week 12	Preference questionnaire

To sum up, this chapter has provided a detailed account of the methodology used in the study. Eighteen high-beginner Chinese L2 students participated in the study, which employed a within-group research design. The students completed three narrative writing tasks in three writing conditions: peer review, co-writing, and individual writing. The writing tasks involved developing narrative writings based on three sets of pictures. Each writing task was completed in three stages: 10 minutes of brainstorming, 30 minutes of writing, and 15 minutes of revision. Their interaction was vediorecorded; screen activities were captured using *CamStudio*; and the written texts were saved on computers. Students also completed five questionnaires (a background questionnaire, three response questionnaires, and a final preference questionnaire).

CHAPTER FOUR – DATA ANALYSIS AND RESULTS: QUALITY OF STUDENT WRITING

This chapter addresses the first research question: What are the effects of peer review, co-writing, and individual writing on CFL students' quality of writing? Three specific areas of writing quality are analyzed: fluency, complexity, and accuracy. The chapter first describes these measures, then introduces the data analysis, and finally presents the results, followed by a summary of the findings.

4.1 Assessment Measures

Six specific measures are used to analyze fluency, complexity, accuracy of students' writing in the study. They are summarized in Table 4.1 below.

Table 4.1 Measures of fluency, complexity, and accuracy used in the study

	Measures
Fluency	1. Mean length of sentences (MLS) 2. Characters per minute (CPM)
Complexity	1. The depth of T-units 2. Mean segmental type-token ratio (MSTTR)
Accuracy	1. Percentage of error-free clauses 2. Empty category

The first index is fluency. Schmidt (1992) suggests that the fluency of language learners' spoken and written production reflects their speed in processing language. In the present study, written fluency refers to "the rate of production of text" (Chenowith &

Hayes, 2001, p.81). Two measures were adopted for the analysis: Mean length of sentences (MLS) and Characters per minute (CPM). MLS refers to the number of syllables, or, in the case of Chinese, the number of characters, in a sentence. Unlike an English sentence, which begins with a capital letter and ends with a period or another terminal punctuation mark after the last word, a discourse-oriented Chinese sentence is usually defined as a stand-alone independent clause, or a series of closely and logically related independent clauses with or without overt linking elements (Li & Thompson, 1981; Lin, 2001). Since the current study examines the writing of beginner Chinese L2 learners who were not yet sufficiently competent to produce complex sentences, a sentence in the current study is defined as a string of discourse that ends with a clear full stop or another terminal punctuation mark (Homburg, 1984; Ishikawa, 1995). That is, the student-marked sentence convention determines a sentence boundary. According to Jin (2007), MLS is appropriate for assessing fluency in Chinese writing. Characters per minute (CPM) refers to the total number of characters produced divided by the total number of minutes used to complete the task. A similar measure, syllables per minute, was used by Chenoweth and Hayes (2001) and Ellis and Yuan (2004).

The second index is complexity. Skehan (2001) suggests that complexity indicates L2 learners' willingness to try out more challenging language forms. Because language learners are still at an early stage of language development, they may sometimes use a wide range of vocabulary items while employing relatively simple grammatical structures (Ellis & Barkhuizen, 2005), or vice versa. Two measures were adopted to measure complexity: grammatical complexity and lexical complexity. Grammatical complexity refers to the degree of sophistication of language forms in written production (Ortega,

2003). It is measured by the depth of T-units; that is, the total number of T-units divided by the total number of sentences (T/S). A T-unit is defined as "one main clause plus the subordinate clauses attached to or embedded with it" (Hunt, 1996, p. 49). A clause is a sentence that is part of a larger sentence (Li & Thompson, 1981). Jin (2007) found that the depth of T-units (T/S) is an appropriate measure for assessing Chinese L2 writing. Lexical complexity refers to the richness of vocabulary in L2 learners' language production (Ellis & Barkhuizen, 2005). It is measured by mean segmental type-token ratio (MSTTR); that is, the mean of type-token ratios in segments, which is computed by the total number of different characters divided by the total number of characters in a segment of text containing 40 characters. Similar measures to analyze the number of words are used for lexical complexity in English L2 writings (Malvern & Richards, 2002; Ellis & Barkhuizen, 2005, Ellis & Yuan, 2004). In the case of Chinese L2 writings, the study used characters rather than words for the sake of clarity.

The third index is accuracy. Accuracy refers to "how well the target language is produced in relation to the rule system of the target language" (Skehan, 1996, p.23). To measure accuracy, two measures were used: percentage of error-free clauses (e.g., Ellis & Backhuizen, 2005; Ellis & Yuan, 2004; Foster & Skehan, 1996) and a special feature of Chinese, empty category, introduced in Jin's (2007) study as an appropriate measure of accuracy in Chinese writing. Percentage of error-free clauses refers to the number of error-free clauses divided by the total number of clauses multiplied by 100 (Foster & Skehan, 1996). Empty category refers to the number of empty categories, including topic, subject, or object, used correctly in a piece of writing. As a discourse-oriented language, Chinese often omits categories that are salient in context; thus, an empty category is often

found in both oral speech and written texts. For example, in the following sentence the object of 喜欢 *xihuan* "like" is omitted.

我们	学校	很	大、很	漂亮，	我	很	喜欢	∅。
women	xuexiao	hen	da hen	piaoliang	wo	hen	xihuan	Ø
we	*school*	*very*	*big very*	*beautiful*	*I*	*very*	*like*	*(it)*

"Our school is big and beautiful. I like it."

4.2 Data Analysis

Before analyzing the data in the main study, I first familiarized myself with the assessment measures by analyzing five pieces of student writing from the second pilot study to ensure consistent assessment when analyzing student writings in the main study. After that, I printed all 45 student writings saved on the computers and numbered them without indicating the participants' names or under which writing condition the writing was produced.

For a fluency variable of MLS, the total number of characters used in the student writings was counted and tabulated, and the number of sentences was analyzed. A sentence boundary was determined by a student-marked sentence convention (Homburg, 1984; Ishikawa, 1995). Sometimes a student sentence determined by a full stop or an exclamation mark consisted of only a string of words that did not contain a clause. In this case, the fragment was still considered as a sentence, but not a clause or a T-unit. These data were input to SPSS 17.0 to generate MLS by dividing the total number of characters by the total number of sentences. Another fluency variable of CPM was computed by dividing the total number of characters produced by the total number of minutes used to

complete the task, using SPSS 17.0. The time (in minutes) spent on each narrative, including the writing and revising stages, was recorded by *CamStudio* and was tabulated.

In terms of complexity variables, the depth of T-units was computed by dividing the total number of T-units divided by the total number of sentences (T/S). To measure mean segmental type-token ratio (MSTTR), each narrative was first divided into segments of 40 characters and the different characters used in each segment were reported .

In computing the accuracy measure of percentage of error-free clauses, all errors were considered, including discourse errors, syntactic errors, lexical errors, and spelling errors. A clause with an insertion of an English phrase or word was considered incorrect. Following Ishikawa (1995), a clause was considered incorrect if it did not fit the discourse context perfectly, even if the clause might be correct in isolation. Then the number of error-free clauses was divided by the total number of clauses multiplied by 100 (Foster & Skehan, 1996). In addition, the number of empty categories used in each piece of writing was counted and tabulated.

Intra-rater and inter-rater reliability were calculated to ensure consistency in the implementation of the assessment measures employed in the analysis of student writings. To check intra-rater reliability, I scored all 45 writings for a second time three weeks following my first scoring. A three-week break between scorings was considered long enough that my second analysis was not likely to be affected by my first analysis. Pearson correlation coefficients for the scores at the two times ranged from a high of 1.00 for clauses to a low of 0.97 for empty categories. To ensure good inter-rater reliability, another trained scorer, a Ph.D. student in Linguistics who was a native speaker of Chinese, scored one-third of the writings individually, using five randomly chosen

narratives on each topic. Pearson correlation coefficients for the two scorers ranged from a high of 1.00 for characters and sentences to a low of 0.89 for empty categories, the only coefficient below 0.97. Any discrepancy in scoring was resolved by discussion between the two scorers.

Before any statistical analyses were conducted, the normal distribution of all six measures in all writing conditions was tested to determine whether parametric or non-parametric testing should be used for further analysis. It was tested by conducting a series of Kolmogorov-Smirnov tests. When the distribution of data was normal, $p > .05$, a repeated measures ANOVA was performed followed by *post hoc* tests where appropriate, i.e., when the F score was statistically significant. When the distribution was non-normal, $p < .05$, Kendall's W, a non-parametric test for ratings between related samples, was performed. Repeat measures ANOVA and related samples non-parametric tests were used because the study used a within-group design with three writing conditions.

4.3 Results

This section reports results on the quality of student writing with regard to three areas of writing quality: fluency, complexity and accuracy. Before that, the time of task completion and the length of writing were examined to ensure it was legitimate to conduct statistical analyses of the data with a view to determining whether writing condition affected the completion of writing tasks.

As indicated previously, students were asked to complete each writing task in three stages: planning (10 minutes), writing (30 minutes) and revising (15 minutes). Despite

the fact that students were allowed 10 minutes for planning, most students spent only around three minutes in this stage, and some spent less than one minute. As seen in Table 4.2 below, most students completed the writing and revising stages within the stipulated time frame. Since sometimes a minute or two had elapsed by the time students wrapped up their writing and stopped the recording software, some students used more minutes than allotted. These brief periods of overtime were ignored in the data analysis.

The writing time, revising time, and the total time students spent are presented in Table 4.3 (see also Figure 4.1). On average, in the peer review condition students spent 27.08 minutes writing their papers, 8.19 minutes revising, and a total of 35.26 minutes. In the co-writing condition, they spent 27.10 minutes writing, 7.22 minutes revising, and a total of 34.31 minutes. In the individual writing condition, they spent 26.46 minutes writing, 9.05 minutes revising, and a total of 35.51 minutes. Results of Kendall's *W* showed that there was no statistical significance in the differences in the writing stage, ($\chi^2(2) = 1.000$, $p > .5$), in the revising stage, ($\chi^2(2) = 4.761$, $p > .05$), or in overall task completion, ($\chi^2(2) = 1.444$, $p > .4$). These results suggested that the three writing conditions did not affect the time of task completion.

Table 4.2 Time of task completion

Pair	Student		Peer review			Co-writing			Individual writing		
	No.	Name	Wr	Re	T	Wr	Re	T	Wr	Re	T
1	1	Tina	29.22	7.53	36.75	26.83	7.57	34.4	24.93	8.38	33.31
	2	Mika	29.33	7.83	37.16	26.83	7.57	34.4	22.03	11.57	33.6
2	3	Elena	15.62	5.13	20.75	16.52	5.45	21.97	14.52	3.3	17.82
	4	Sung	19.73	5.23	24.96	16.52	5.45	21.97	22.97	3.18	26.15
3	5	Daeng	21.57	5.50	27.07	29.85	4.05	33.9	25.23	5.5	30.73
	6	Keiko	21.82	11.33	33.15	29.85	4.05	33.9	29.65	5.0	34.65
4	7	Aki	21.67	4.50	26.17	28.32	5.08	33.4	19.0	5.38	24.38
	8	Cathy	30.23	5.80	36.03	28.32	5.08	33.4	25.37	8.63	34
5	9	Rena	30.01	15.50	45.51	23.95	10.53	34.48	27.23	11.73	38.96
	10	Mark	29.98	6.83	36.81	23.95	10.53	34.48	31.48	7.52	39
6	11	Kyoko	28.03	7.03	35.06	24.9	7.18	32.08	29.33	14.18	43.51
	12	Sara	28.8	8.88	37.68	24.9	7.18	32.08	29.33	15.38	44.71
7	13	Yuko	32.18	8.17	40.35	30.72	4.67	35.39	32.08	10.02	42.1
	14	Rak	27.77	9.17	36.94	30.72	4.67	35.39	27.22	9.75	36.97
8	15	Sue	29.73	8.28	38.01	32.0	10.40	42.4	31.52	12.93	44.45
	16	Tim	27.57	8.55	36.12	32.0	10.40	42.4	30.02	15.27	45.29
9	17	Helen	32.37	14.50	46.87	30.77	10.02	40.79	31.97	6.97	38.94
	18	Rick	31.78	7.58	39.36	30.77	10.02	40.79	22.45	8.23	30.68
Total			487.41	147.34	634.75	487.72	129.9	617.62	476.33	162.92	639.25

Key: Wr: Writing
Re: Revision
T: Total

Table 4.3 Non-parametric related samples test: Time spent in the three writing conditions

	Writing Stage			Revision Stage			Whole Process		
	PE	CO	IN	PE	CO	IN	PE	CO	IN
N	18	18	18	18	18	18	18	18	18
Max	32.18	30.77	32.08	15.50	10.53	15.38	45.51	42.4	45.29
Min	15.62	16.52	14.52	4.50	4.05	3.3	20.75	21.97	17.82
Mean	27.08	27.10	26.46	8.19	7.22	9.05	35.26	34.31	35.51
s.d.	4.83	4.68	4.88	3.00	2.50	3.89	6.77	5.60	7.62
Kendall's W		.028			.132			.040	
Chi-square		1.000			4.761			1.444	
p		.607			.093			.486	

Key: PE: Peer Review
CO: Co-writing
IN: Individual Writing

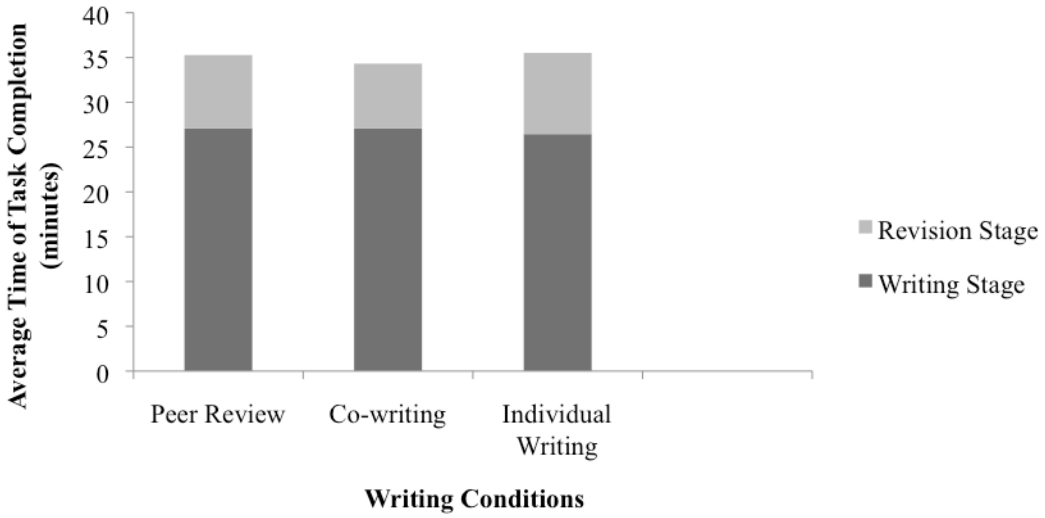

Figure 4.1 Average time of task completion in three writing conditions

The data of the length of writing in the three writing conditions are presented in Table 4.4 below, also see Figure 4.2. As is seen, students wrote most in the individual writing condition (198 characters), and produced roughly the same length of writing in

the peer review (184 characters) and co-writing (185 characters) conditions. The longest writings were produced in the individual writing condition, followed by the peer review condition. However, the shortest writings were also found in these same two conditions, suggesting there was considerable variation in the length of writing in the two conditions, as reflected in the high standard derivations reported. However, based on Kendall's *W*, these differences were not statistically significant, $\chi^2(2) = 4.423$, $p > .1$. The results suggested that the length of writing was not affected by the three writing conditions either.

Table 4.4 Non-parametric related samples test: Length of student writing in three writing conditions

	Characters		
	PE	CO	IN
N	18	18	18
Max	272	252	301
Min	103	142	103
Mean	184.00	185.44	198.06
s.d.	43.33	37.39	56.07
Kendall's W		.123	
Chi-square		4.423	
p		.110	

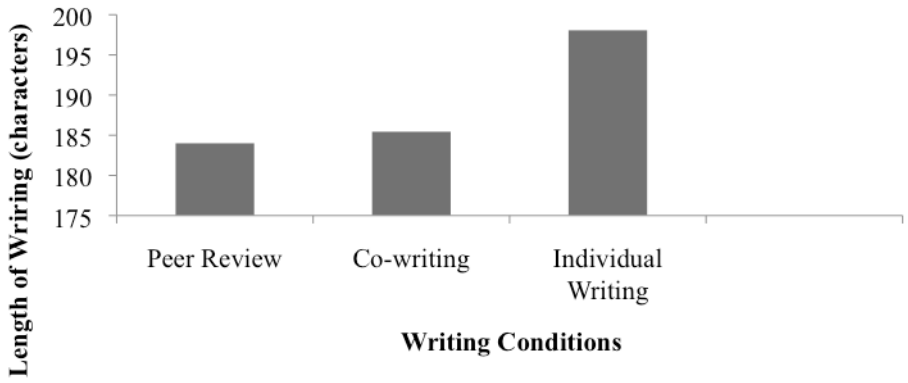

Figure 4.2 Length of student writing in three writing conditions

Results of the above analyses revealed that students used a similar amount of time and produced writings of similar length in the three writing conditions. Results related to the research question on the examination of quality of student writing are reported below with respect to fluency, complexity, and accuracy.

4.3.1 Fluency of student writing

As noted earlier, two measures were adopted to analyze the fluency of student writing: MLS (mean length of sentences) and CPM (characters per minute). Before statistical analyses were conduced on the two measures, the Kolmogorov-Smirnov test was performed to explore the normality of data distribution. Results revealed that the distribution of data was non-normal for both measures, because two *p* values in each measure were less than .05 (see Table 4.5). Thus, a repeated samples non-parametric analysis, Kendall's *W*, was conducted.

Table 4.5 Normality analysis of fluency measures in three writing conditions

Measures	Conditions	Normality
MLS	Peer review condition	$D(18) = .213, p < .05^{*}$
	Co-writing condition	$D(18) = .281. p < .01^{*}$
	Individual writing condition	$D(18) = .123, p > .2$
CPM	Peer review condition	$D(18) = .139, p > .2$
	Co-writing condition	$D(18) = .234, p < .05^{*}$
	Individual writing condition	$D(18) = .218, p < .05^{*}$

Note: Asterisks indicate that the analysis reaches a statistically significant result because the *p* value is less than .05.

Results of Kendall's *W* are presented in Table 4.6 below. In terms of mean length of sentences (also see Figure 4.3), on average, students tended to write longer sentences in the peer review condition (11.31 characters per sentence) and in the individual condition (11.08 characters per sentence) than in the co-writing condition (10.06 characters per sentence). However, no significant difference was found among the three writing conditions, $\chi^2(2) = 3.444$, $p > .1$. In terms of characters per minute (also see Figure 4.4), students tended to produce writing more quickly in the individual writing condition (5.82 characters per minute) than in the co-writing (5.52 characters per minute) and peer review (5.43 characters per minute) conditions. However, no significant difference was found among the three writing conditions, $\chi^2(2) = .444$, $p > .5$.

Table 4.6 Analysis of fluency in three writing conditions

	MLS			CPM		
	PE	CO	IN	PE	CO	IN
N	18	18	18	18	18	18
Max	19.83	12.57	15.08	9.73	7.61	12.35
Min	7.00	7.89	7.09	2.52	3.90	2.90
Mean	11.31	10.06	11.08	5.43	5.52	5.82
s.d.	3.00	1.69	2.43	1.69	1.29	2.07
Kendall's W		.096			.012	
Chi square		3.444			.444	
p		.179			.801	

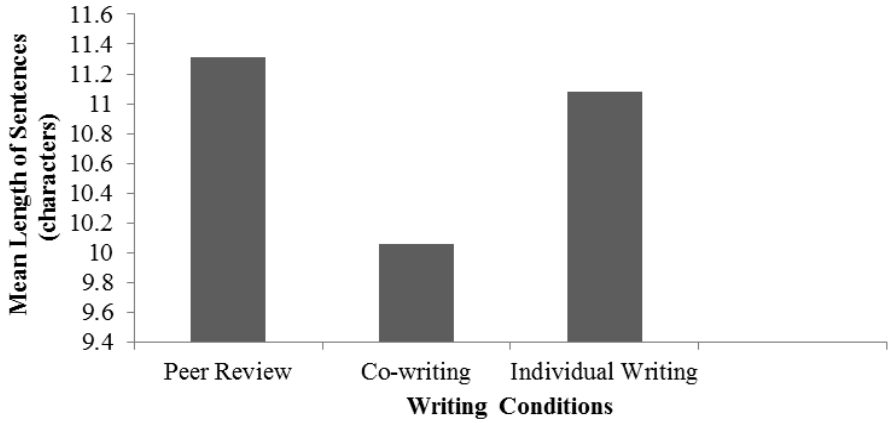

Figure 4.3 Mean length of sentences in three writing conditions

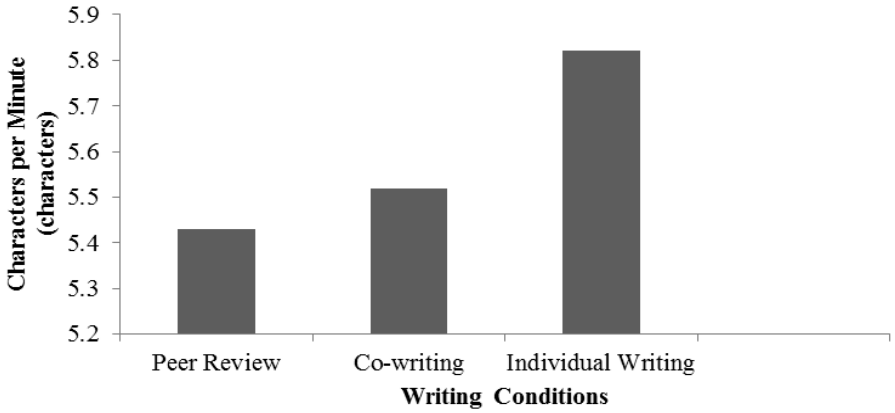

Figure 4.4 Characters per minute in three writing conditions

Overall, these results suggest that the fluency of student writing was not affected by the three writing conditions. Although students had the freedom to produce their own writings in the individual writing condition and tended to write longer sentences and wrote faster, results of the statistical analyses showed that writing fluency in the three writing conditions was similar.

4.3.2 Complexity of student writing

As previously indicated, two measures were used to assess the complexity of language use in student writing. Lexical complexity was examined using MSTTR-40 (mean segmental type-token ratio per 40 characters), and syntactic complexity using the depth of T-units (T-units per sentence). The Kolmogorov-Smirnov test was first performed to examine the normality of the data distribution. Results are presented in Table 4.7 below. As seen, the MSTTR data were normally distributed with all p values greater than .01. Thus, an ANOVA was used for data analysis. However, the data distributions of the depth of T-units were non-normal, with all p values less than .05. Thus, Kendall's W was used for further analysis.

Table 4.7 Normality analysis of complexity measures in three writing conditions

Measures	Conditions	Normality
MSTTR-40	Peer review condition	$D(18) = .110, p > .2$
	Co-writing condition	$D(18) = .177. p > .2$
	Individual writing condition	$D(18) = .134, p > .1$
Depth of T-units	Peer review condition	$D(18) = .208, p < .05^{*}$
	Co-writing condition	$D(18) = .234, p < .05^{*}$
	Individual writing condition	$D(18) = .249, p < .05^{*}$

Table 4.9 and Figure 4.5 below present results of an ANOVA for the measure of lexical complexity, mean segmental type-token ratio. Students produced greater lexical variety in the co-writing condition (77.11%), followed by the peer review condition (76.73%). The individual writing condition produced writings with the least lexical complexity (76.37%). However, these differences failed to reach statistical significance, $F(1.39, 34) = 1.74, p > .5$.

Table 4.8 ANOVA repeated measures analysis: Lexical complexity in three writing conditions

	MSTTR-40		
	PE	CO	IN
N	18	18	18
Max	84.17	86.88	83.75
Min	67.50	70.63	71.00
Mean	76.63	77.11	76.37
s.d.	4.14	5.49	4.02
	$F(1.39, 34) = 1.74$		
	$p = .76$		

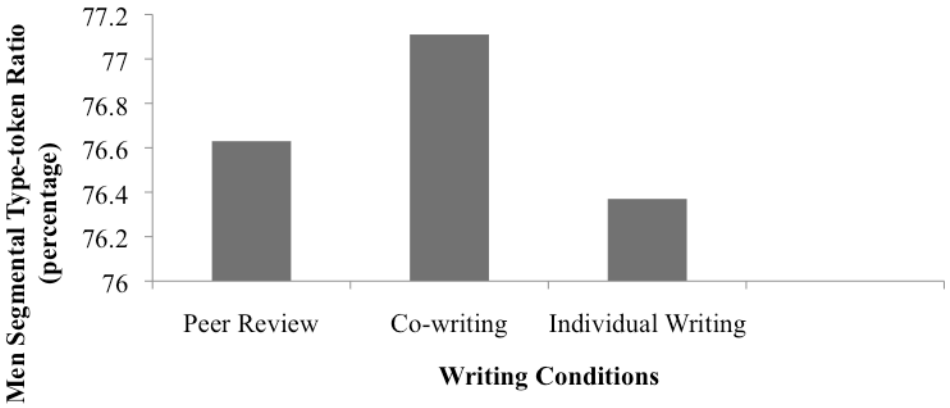

Figure 4.5 Lexical complexity (mean segmental type-token ratio) in three writing conditions

Results of Kendall's *W* on the depth of T-units are reported in Table 4.10 and Figure 4.6 below. The analysis showed that students tended to use the most complex sentence structures in the individual writing condition, and the simplest in the co-writing condition, with values for the peer review condition falling in between. However, these differences were not statistically significant, $\chi^2(2) = 2.000$, $p > .5$.

Table 4.9 Non-parametric repeated samples test: Syntactic complexity in three writing conditions

	T/S		
	PE	CO	IN
N	18	18	18
Max	1.42	1.29	1.50
Min	1.00	1.00	1.00
Mean	1.13	1.08	1.16
s.d.	0.13	0.10	0.17
Kendall's W		.056	
Chi square		2.000	
p		.368	

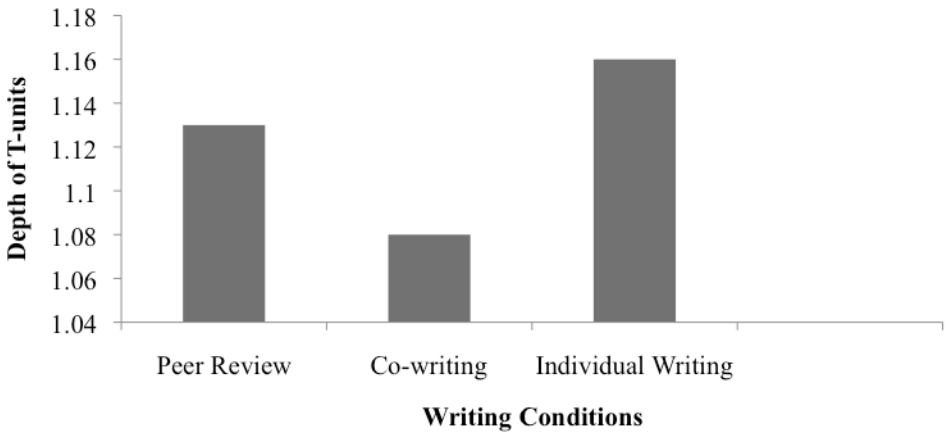

Figure 4.6 Syntactic complexity (depth of T-units) in three writing conditions

Overall, there is a tendency that students used a wider variety of vocabulary but simpler sentence structures when they collaborated with their partners than when they worked individually. However, these differences were not statistically significant. These results suggest that both lexical and syntactical complexity of student writing was not affected by the three writing conditions.

4.3.3 Accuracy of student writing

As discussed earlier, the accuracy of student writings was measured in two ways: percentage of error-free clauses and empty categories. Kolmogorov-Smirnov tests were first conducted to examine whether the data were normally distributed. Results are presented in Table 4.12 below. The results indicated that the data of the percentage of error-free clauses were normally distributed, with all *p* values greater than .2. Thus, an

ANOVA was used for data analysis. However, the empty category data distribution in the individual writing condition was significantly non-normal, $p < .01$. Therefore, Kendall's *W* was used for further analysis.

Table 4.10 Normality analysis of accuracy measures in three writing conditions

Measures	Conditions	Normality
Percentage of error free clauses	Peer review condition	$D(18) = .110$, $p > .2$
	Co-writing condition	$D(18) = .177$. $p > .2$
	Individual writing condition	$D(18) = .134$, $p > .2$
Empty categories	Peer review condition	$D(18) = .208$, $p > .2$
	Co-writing condition	$D(18) = .234$, $p > .05$
	Individual writing condition	$D(18) = .249$, $p < .01^{*}$

ANOVA results on the error-free clauses are presented in Table 4.13 and Figure 4.7 below. Students produced a much higher percentage of error-free clauses in the two collaborative writing conditions than in the individual writing condition. In the peer review and co-writing conditions, 69.37% and 69.49% of clauses in students' writings were correct, respectively. By contrast, the percentage of error-free clauses produced in the individual condition was much lower, at only 56.33%. Mauchly's test indicated that the assumption of sphericity was met ($\chi^2(2) = 3.79$, $p > .1$), indicating that the variances of the differences among conditions are roughly equal. A repeated measures ANOVA analysis showed the differences in the three writing conditions to be statistically significant, $F(2, 34) = 5.83$, $p < .01$. *Post hoc* tests using the Bonferroni correction revealed a statistically significant difference between the peer review and the individual conditions ($p < .05$), a difference approaching significance between the co-writing and

the individual conditions (p = .054), and a non-significant difference between the peer review and the co-writing conditions (p = 1.00).

Table 4.11 Repeated measures ANOVA analysis: Accuracy in three writing conditions

	Error-Free Clauses		
	PE	CO	IN
N	18	18	18
Max	88.00	90.91	90.00
Min	50.00	47.62	20.00
Mean	69.37	69.49	56.33
s.d.	11.47	11.64	22.95
	$F(2, 34) = 5.83$		
	$p = .007$		

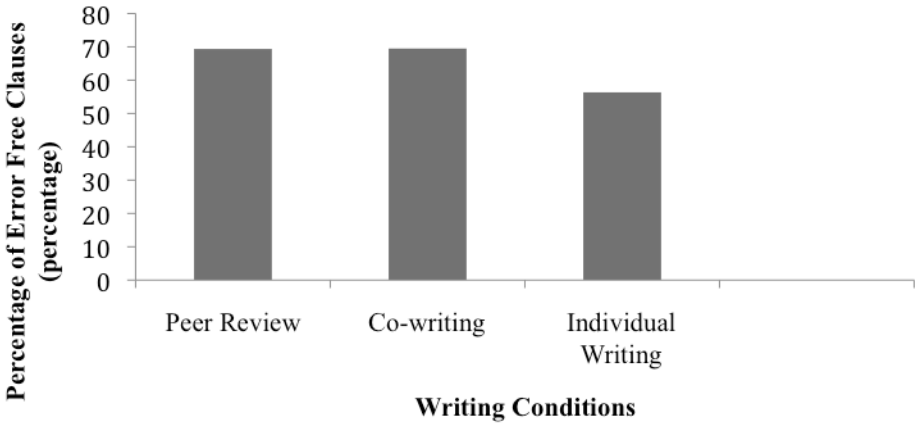

Figure 4.7 Percentage of error-free clauses in three writing conditions

Table 4.14 below shows results of Kendall's W on a special feature of Chinese writing: empty categories. Students used 3.72 instances of empty category in the individual writing condition, followed by 3.06 and 2.67 instances in the peer review and

co-writing conditions, respectively. The Kendall's *W* failed to show the differences to be statistically significant, $\chi^2(2) = 2.844$, $p > .2$.

Table 4.12 Non-parametric repeated samples test: Accuracy in three writing conditions

	Empty Categories		
	PE	CO	IN
N	18	18	18
Max	6	6	12
Min	0	0	0
Mean	3.06	2.67	3.72
s.d.	2.01	2.17	3.46
Kendall's W		.079	
Chi square		2.844	
p		.241	

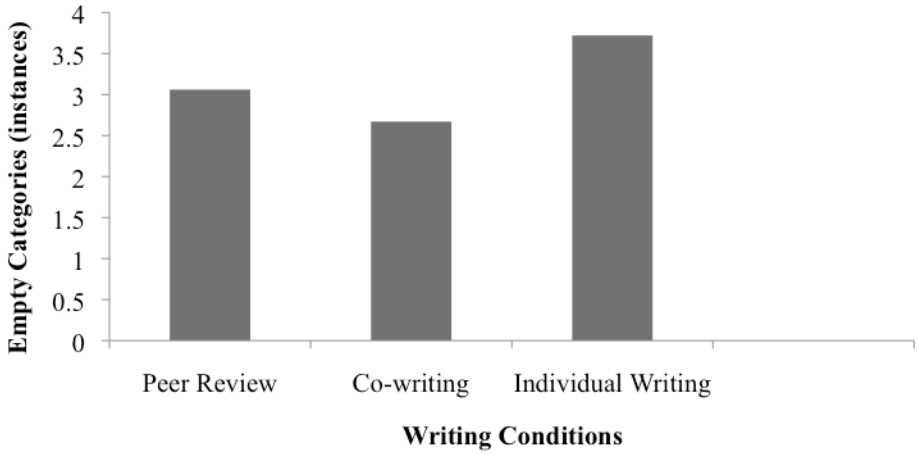

Figure 4.8 Empty categories in three writing conditions

Overall, the results of analyzing the percentage of error free clauses indicate that the two collaborative writing conditions resulted in more accurate writing than the individual writing condition, but there was no difference between the two collaborative writing conditions.

4.4 Summary

In summary, students in the current study produced writings of sufficient length for analysis and spent approximately the same amount of time in producing their writing in the three writing conditions. That is, writing condition had no impact on task completion. Analysis of the quality of student writing showed that students exhibited different strengths in the three writing conditions. In the case of fluency, students wrote longer sentences in the peer review and the individual writing conditions than in the co-writing condition, and they also wrote more quickly in the individual writing condition, but the differences were not statistically significant. That is to say, the results indicate that the freedom of developing their own writing in the individual writing condition does not result in higher fluency in writing.

Analysis of the complexity of language use revealed that students tended to use a wider variety of vocabulary in the co-writing condition than in the peer review condition; and, in turn, more in the peer review than in the individual writing condition, suggesting that collaboration tends to result in greater retrieval of vocabulary from students' existing knowledge of language. However, with respect to syntactic complexity, the opposite finding was observed. Students used more syntactically complex sentences in the individual writing condition than in the peer review condition; and in turn, more complex sentences in the peer review than in the co-writing condition, suggesting that students tend to take up the challenge of using complex syntactic structures when they work individually. However, no statistical significance was observed in the differences. The

results thus suggested that complexity of student writing was not affected by the three writing conditions.

Comparisons of accuracy of student writing in the three writing conditions demonstrate the clear advantage of collaboration. In terms of the percentage of error-free clauses, students were significantly more likely to produce accurate clauses in the co-writing and peer review conditions than in the individual condition, and no significant differences were found between the two collaborative writing conditions. When a special feature of Chinese language, empty categories, was examined, no statistically significant differences were found among three writing conditions. However, the feature of empty categories was only recently proposed as a measure of accuracy in Chinese writing (Jin, 2007), it is possible that closer examination of this measure is needed in future.

In sum, all three writing conditions seem to help students develop their writing skills in different ways. The two collaborative writing approaches direct significantly more students' attention to the accuracy of language production; however, no significant differences are evident between the two approaches. Although analysis of writing fluency and complexity did not show any significant differences, some tendencies are observed. Individual writing tends to promote students' fluency and their willingness to use more syntactically complex sentence structures. On the other hand, collaborative writing tends to foster retrieval of lexical knowledge. Possible reasons for such findings and their implications will be discussed in Chapter 7.

CHAPTER FIVE – DATA ANALYSIS AND RESULTS: NATURE OF STUDENT VERBAL INTERACTION

This chapter presents the data analysis procedures and findings related to the second research question: What kind of interaction occurs when students discuss their writing in peer review versus co-writing? To address this question, student verbal interaction was recorded, transcribed, and coded. After coding of the transcripts was completed, the data were inputted into SPSS 17.0 for analysis. Results of this analysis are presented in the second section of the chapter, followed by a summary of the research findings at the conclusion of the chapter.

5.1 Data Analysis

The main sources of data used to address the second research question include: transcripts of the videorecorded pair interactions, the completed tasks, and the videorecorded screen activities while students were using *CamStudio*. Altogether, 27 transcripts of pair talk were completed for the two writing conditions: 18 in the peer review condition (2 for each pair, because two separate pieces of writing were dealt with) and 9 in the co-writing condition (1 for each pair, because only one joint piece of writing was dealt with).

Since the main purpose of transcription in the current study was to analyze and compare the content of negotiation episodes in the revision stage in the two collaborative writing conditions, the analysis was restricted to student interactions in this stage. A total

number of 212.29 minutes of verbal interaction data were transcribed, including 147.34 minutes of interaction in the peer review condition and 64.95 minutes of interaction in the co-writing condition. The peer review data is almost twice as long as the co-writing data because in the former condition, each pair of students worked on two pieces of writing, while in the latter condition, only one piece of writing was being discussed.

Students mostly used English in their discussions, except when they read the writings aloud and when they made changes to the writings, which were written in the target language of Chinese. All utterances in Chinese were transcribed in characters. Given the inaccessibility of Chinese characters to readers unfamiliar with Chinese, the transcripts were labelled as follows. First, characters were labelled with pinyin without tone marks one line below the characters. In the third and fourth lines, an English gloss and an English translation were provided, respectively. Turns were numbered in the transcripts. Where necessary, explanations of the negotiation and of the written discourse (e.g., clarification of an error that would limit understanding of the transcript) were provided in arrow brackets.

Student verbal interactions were transcribed following established transcription conventions (see Appendix 6), which were developed based on the initial efforts to transcribe students' verbal interaction in the pilot studies and on the existing literature on transcription conventions used in the SLA field (Nixon, 2007; Ohta, 2001; Storch, 2003; Swain & Lapkin, 1998; Suzuki, 2006). The transcripts of the current study were first segmented into negotiation episodes.

An episode is defined as a stretch of discourse (a word, sentence, turn, or several turns) that is semantically related to a topic or purpose (De Guerrero & Villamil, 1994;

Nelson & Carson, 1998; Storch, 2001). Altogether, 816 episodes were segmented in the 27 transcripts. These episodes were divided into three major categories: on-, about-, and off-task episodes. The criterion for an on-task episode is one in which students discuss their writings to complete the task (e.g., De Guerrero & Villamil, 1994; Storch, 2001; Villamil & De Guerrero, 1996). This criterion includes the interaction in which students talked about linguistic issues, content issues, and idea issues, and in which students read or assessed their writing or revisions. The following is an example of an on-task episode:

Example 5.1 An on-task episode

(Original text: 她们 说 中国 很 漂亮， 很 好玩儿。）
tamen shuo Zhongguo hen piaoliang, hen haowanr
they-fem. say China very beautiful, very fun
They say that China is very beautiful and a fun place.

1 Kyoko: Maybe you can use 美丽 for 漂亮，but it still makes sense, right?
meili piaoliang
beautiful beautiful
2 Sara: Like 美.
mei
beautiful
3 Kyoko: Just the same thing, right?
4 Sara: Yeah.

(Sara, peer review)

In this episode, Kyoko made a suggestion on word choice. She suggested using 美丽 (meili) to replace 漂亮 (piaoliang) in Sara's original text (line 1). Both the suggested and the original Chinese words mean 'beautiful', but are used in different contexts. This exchange is directly related to the writing task.

About-task episodes are those when students discuss the procedures to complete the writing tasks. When students talk about things irrelevant to writing, their interaction is coded as off-task episodes. Since the purpose of the interaction analysis is to investigate the types of verbal interaction that occur in students' discussion of their writing, only the on-task episodes were further analyzed. There were 711 on-task episodes, accounting for 87.1% of total episodes. They were coded into five subcategories: language-related episodes (LREs), idea-related episodes (IREs), content-related episodes (CREs), text-reading episodes (TREs), and text-assessing episodes (TAEs). The following table summarizes the coding scheme used in this study to categorize the types and sub-types of on-task episodes.

Table 5.1 Types of on-task episodes

On-task episodes	
(i)	LREs (language-related episodes) • LRE-lexis Word choice Word meaning • LRE-grammar Verb forms Measure words Word usage Linking devices Sentence structure Sentence expansion Sentence meaning • LRE-mechanics Characters/spelling Pinyin/spelling Pronunciation Punctuation
(ii)	IREs (idea-related episodes)
(iii)	CREs (content-based episodes)
(iv)	TREs (text-reading episodes)
(v)	TAEs (text-assessing episodes)

5.1.1 Language-related Episodes (LREs)

Swain (1998) defined an LRE as "any part of a dialogue in which students talk about the language they are producing, question their language use, or other- or self-correct" (p.70). Based on categorization conventions described in the literature (Kowal & Swain, 1994; Nixon, 2007; Storch, 2001, 2002, 2003; Suzuki, 2006; Swain & Lapkin, 1998), in the current study LREs are defined as the episodes in which participants talk about language form issues, such as lexis, grammar, and mechanics. Thus, LREs were further divided into these three categories: (1) lexis (word choice, and word meaning), (2) grammar (verb forms,[6] measure words, word usage, linking devices, sentence structure, sentence expansion, and sentence meaning), and (3) mechanics (characters/spelling, pinyin/spelling, pronunciation, and punctuation).

LRE-lexis: When the focus of student negotiation related to word choice or word meaning, the episodes were coded as LRE-lexis. Examples 5.2 and 5.3 below are such lexis-based LREs.

A previously mentioned example (see Example 5.1, repeated below) is an illustration of an LRE-lexis dealing with word choice. In Sara's original text, she chose 漂亮 (piaoliang) to express the meaning that China is a beautiful country. Kyoko suggested using 美丽 (meili) to replace 漂亮 (piaoliang) in Sara's original text (line 1). Although

[6] It was the verb form, not the verb tense, that was considered in categorization, because Chinese is not a tense, but an aspect, language. Thus, the episodes that dealt with aspect and verb compliments were coded as LRE-Grammar (verb form).

no change was made after their discussion, this episode demonstrates that the two students tried to decide which was a proper word to use.

Example 5.2 An LRE-lexis dealing with word choice

(Original text: 她们 说 中国 很 漂亮， 很 好玩儿。）
tamen shuo Zhongguo hen piaoliang, hen haowanr
they-fem.say China very beautiful, very fun
They say that China is very beautiful and a fun place.

1 Kyoko: Maybe you can use 美丽 for 漂亮，but it still makes sense, right?
meili piaoliang
beautiful beautiful
2 Sara: Like 美.
mei
beautiful
3 Kyoko: Just the same thing, right?
4 Sara: Yeah.

(Sara, peer review)

When one participant explained the meaning of a character or a word to the other, the episode was coded as an LRE-lexis episode dealing with word meaning. In the following example of a peer review activity on Cathy's writing, Aki did not know two of the characters in her writing. He raised his tone and paused (line 1). Cathy got the signal and read the word (line 2), which was followed by a repetition by Aki, and then Cathy provided the meaning of the word (line 4).

Example 5.3 An LRE-lexis dealing with word meaning

(Original text: 马力 觉得 英语 课 很 有意思。）
mali juede Yingyu ke hen youyisi
Mali (name) feel English class very interesting
Mali thinks the English class is very interesting.

1	Aki	“马力: ”? (3) <unsure about the following two characters> mali *Mali (name)*
2	Cathy	Oh, “觉得”。 juede *feel*
3	Aki	觉得。 juede *feel*
4	Cathy	It means like ‘he thinks’.

(Cathy, peer review)

LRE-grammar: When the focus of negotiation concerned grammatical accuracy, including verb forms, measure words, word usage, linking devices, sentence structures, sentence expansion, and sentence meaning, the episodes were coded as LRE-grammar. In the current study, episodes dealing with word usage and linking devices were coded as LRE-grammar rather than LRE-lexis (word choice) because “students based their decisions on grammatical conventions rather than meaning considerations” (Storch, 2001a, p. 142). Examples 5.4 to 5.10 below are seven examples of grammar-based LREs.

In the following example, Sue suggested that it should not be necessary to use the completion particle 了 (le) twice, one each after a verb, as was done in Tim’s original text, and that only the first particle should be sufficient (line 1). Tim’s immediate response was to accept Sue’s suggestion (line 2), but then he explained why he had used the particle twice initially (line 4). He had done so because there were two completed actions. Sue agreed to Tim’s explanation and was hesitant about her own argument (line 5). Their final decision was to keep the particle in two occurrences in the original text.

Example 5.4 An LRE-grammar dealing with verb forms

(Original text: 打 了 电话 她 去 了 医院。）
da le dianhua ta qu le yiyuan
hit asp. telephone she go asp. hospital
After making the phone call, she went to the hospital.
<The students were discussing whether two aspect markers *le* were needed in the sentence. >

1	Sue	(7) Oh, I don't think you need "打 了 电话 她 去 了 医院。" da le dianhua ta qu le yiyuan *hit asp. telephone she go asp. hospital* 打 了 电话 她 去 医院。 da le dianhua ta qu yiyuan *hit asp. telephone she go hospital*
2	Tim	(1) Ok, yeah yeah yeah.
3	Sue	Shall we?
4	Tim	But it's two complete, they're two: different things, two: different actions that were completed. She hung up the phone, and then she WENT to the doctor.
5	Sue	Yeah. I guess. (2) Huh? I don't know. "她" XXX [laughing] ta *she*

(Sue & Tim, co-writing, revision)

The use of measure words is a special feature of the Chinese language. When a numeric expression precedes a noun, a measure word denoting the semantic meaning of the noun is needed. That is, the choice of measure word before a noun is specific, rather than random. For example, 条 (tiao) is used before nouns that are long, narrow, and winding, such as 'rivers', 'pants', 'fish', 'snakes', or 'roads'. 张 (zhang) is used for objects that have a rectangular, or square, and flat surface, such as 'tables', 'paper', 'tickets', 'stamps', or 'beds'. When two students discussed a missing or misused measure word, the episode was coded as an LRE-grammar dealing with measure words. In the

following example, Kyoko suggested that a measure word was needed for 飞机票 (feijipiao) '*plane ticket*' (line 2). Sara provided the correct measure word 张 (zhang) (line 3) and sought confirmation (line 5). Kyoko confirmed Sara's choice of the measure word (line 6).[7]

Example 5.5 An LRE-grammar dealing with measure words

(Original text: 马力 去 卖 了 飞几票。)
mali qu mai le feiji.piao
Mali(name) go sell asp. plane.ticket
Intended meaning: Mali went to buy a plane ticket.

<The students were discussing the use of a measure word before *feijipiao* 'plane ticket'. In addition, there were two typos in the writing. The writer Sara had an intention to write 'to buy', but the character was spelled wrong, which meant 'to sell'. However, she read the character correctly as 'to buy' in the peer review interaction. Another typo was *ji* in *feijipiao* 'plane ticket', and it was pointed out by Kyoko in line 4 and corrected by Sara in line 7. >

1	Sara	"马力 去 卖 了(.) 飞几票。 他 想 二月" // mali qu mai le feiji.piao ta xiang eryue *Mali(name) go sell asp. plane.ticket he want February*
2	Kyoko	//Or maybe you need a measure word for 飞机票。 feiji.piao *plane.ticket*
3	Sara	一 张// yi zhang *one M.W.*
4	Kyoko	//And 飞机票 的 机 是 a different character, I think. feiji.piao de ji shi *plane.ticket poss. machine be*
5	Sara	So 一 张, right? yi zhang *one M.W.*
6	Kyoko	Yeah.

[7] The episode was coded and counted as two LREs: an LRE-grammar (measure words) and an LRE-mechanics (character/spelling). This is also an example of an embedded and interrupted LRE. See Example 5.20 and Example 5.21 for more explanation.

7	Sara	一 (.) 张 <typing> 飞机 <typing the right character for 机>. This one, right?
		yi zhang feiji ji
		one M.W. plane machine
8	Kyoko	Yeah.
9	Sara	飞机票。
		feiji.piao
		plane.ticket
10	Kyoko	Huh.

(Sara, peer review)

When students discussed the usage of certain words, such as whether a word could take an object, whether a verb phrase was a verb-object verb in which the object could take a modifier, or whether two words could be used together, the student interaction was coded as an LRE-grammar dealing with word usage. In the example below, after reading Cathy's sentence, Aki paused for three seconds because of the incorrect use of the verb phrase (line 1), *yingyu shangke* "have an English class". Cathy explained her intention (line 2), and Aki suggested a correct verb form in line 3, *shang yingyu ke*. Cathy accepted the suggestion (line 4). Following this exchange, Aki continued with an explanation as to why he made such a suggestion (line 7), which was confirmed by Cathy again (line 8). As seen in this interaction, the students' decision was not made at the level of lexis, but rather, was based on grammatical convention; namely, whether the verb phrase *shangke* "have class" is a verb-object verb, which allows modifiers in front of the object.

Example 0.6 An LRE-grammar dealing with word usage

(Original text: 他 八 点钟 英语 上课。<incorrect>)
ta ba dianzhong yingyu shangke
he eight o'clock English have.class
Intended meaning: He has an English class at eight o'clock.

1	Aki	“他, 他 八 点钟 英语 上课。”（3）<incorrect> ta ta ba dianzhong yingyu shangke *he he eight o’clock English have.class* *He has an English class at eight o’clock.*
2	Cathy	I want to say that his class //starts at eight. //
3	Aki	//Yeah. I know. I know. // I think it is 他: 八 点钟(.) 上 英语 ta ba dianzhong shang yingyu *he eight o’clock have English* 课。<correct> ke *class*
4	Cathy	OK.
5	Aki	I think. I am not sure. I think. Am I right? <Asking the teacher>
6	Cathy	Can’t ask her.
7	Aki	I think 上 is a breakable verb. shang *have* <A breakable verb here refers to a verb-object verb>
8	Cathy	Yeah, I think so.

(Cathy, peer review, revision)

Linking devices are words that link phrases, clauses, or sentences. In Chinese, the linking device to connect two noun phrases is 和 (*he*); to connect two verb phrases, Chinese uses 也 (*ye*) or 还 (*hai*). When students’ interaction involved the use of linking devices, either adding, deleting, or discussing a linking device, the interaction was coded as an LRE-grammar dealing with linking devices. In the following example, Keiko and Daeng discussed the linking devices used in Daeng’s writing after Keiko pointed out two typos in his sentence. The discussion of the two typos is not included in the example for the sake of concision. Keiko pointed out that the conjunction 和 (*he*) ‘and’ was needed to connect the two noun phrases 衣服 (*yifu*) ‘clothes’ and 礼物 (*liwu*) ‘present’, and that another one was necessary to connect 礼物 (*liwu*) ‘present’ and 蛋糕 (*dangao*) ‘cake’ in

Daeng's writing. Then, she went ahead and made the changes to his writing (line 1), including the changes to the linking devices and the misspelled characters. Daeng accepted the changes (line 2).[8]

Example 0.7 An LRE-grammar dealing with linking devices

(Original text: ……我们 买 很多 依附， 也 礼物 也 但搞。)
Women mai henduo yifu, ye liwu ye dangao
We buy many 'clothes' also present also 'cake'
We bought a lot of clothes, presents, and a cake.
<There were two spelling mistakes of two noun phrases for 'clothes' and 'cake', and misuse of linking devices>

1 Keiko: Now, you have to connect these with 和。 <"These" refers to 衣服 (yifu) he *and* 'clothes' and 礼物 (liwu) 'present'.> 礼物, 和，蛋，<typing and liwu he dan *present and egg* selection characters> No, not here. 糕，Ok. gao *cake*

2 Daeng: Ok.

(Daeng, peer review)

Students sometimes talked specifically sentence structure, word order, or a missing verb. When their interaction pertained to the sentence level, e.g., focusing on the sentence structure by proposing the addition or deletion of a word bearing grammatical functions and/or rearranging the word order, the episode was coded as LRE-grammar (sentence

[8] The episode was coded and counted as three LREs: two LREs-mechanics (character/spelling) and one LRE-grammar (linking device). This is also an example of an embedded LRE. See Example 5.20 for more explanation.

structure). In the following example, for example, Mika and Tina discussed whether it was necessary to add a predicative verb 是 (*shi*) 'be' to connect the subject, proper name 马力 'Mali', and the predicative noun phrase 很好学生 (*henhao xuesheng*) 'good student'. Mika initiated the conversation, wondering if her own writing sounded grammatical (line 1) and whether a "be" verb *shi* was actually needed (lines 3 and 5). Mika admitted that she had used *shi* earlier, but had then taken it out (line 7). Tina was not certain what to do at first (lines 2, 4, 6), but after giving the matter some thought for four seconds, she suggested that *shi* was needed (line 8) and confirmed it again (line 10). The two finally agreed that *shi* should be added to the sentence, and this joint decision made the sentence grammatical.

Example 5.8 An LRE-grammar dealing with sentence structure

(Original text: 马力 很 好 学生。)
Mali hen hao xuesheng
Mali (name) very good student
Intended meaning: Mali is a good student.
<incorrect sentence with a missing verb>

1 Mika: "马力 很 好 学生。" <Incorrect sentence with a missing verb>
Mali hen hao xuesheng
Mali (name) very good student

Is that how you say it?

2 Tina: Um. <not sure>

3 Mika: Or do you need 是?
shi
be

4 Tina: 他 是 很 好- <trying out the sentence with the missing verb added>
ta shi hen hao
he be very good

5	Mika:	Do you?
6	Tina:	I'm not really sure. [laughing]
7	Mika:	[laughing] I first had 是, but then-
		shi
		be
8	Tina:	马力 是(4) Maybe 是
		Ma.Li shi shi
		Ma Li be be
9	Mika:	是, right?
		shi
		be
10	Tina:	Yeah.

(Mika, peer review)

The confusion, or uncertainty, stems from the fact that unlike English, a Chinese sentence does not take a predicative verb *shi* 'be' if there is a predicative adjective phrase or a predicative prepositional phrase. In English a 'be' verb is required whether or not a predicative is a noun phrase, an adjective phrase, or a prepositional phrase. Although the change resulted simply in adding one word, the addition of *shi* involved a change at a sentence level, rather than at the word level, because *shi* bears a significant syntactic role. Therefore, this episode was coded as LRE-grammar (sentence structure).

When students discussed expanding or truncating a sentence by adding or deleting a word or phrase in the original text to expand the sentence or to make it more concise, the interaction was coded as an LRE-grammar (sentence expansion). This kind of interaction was coded differently from an LRE-grammar (sentence structure) because it does not deal with the grammaticality of the sentence, but rather, the meaning of the sentence. In the example below, Kyoko suggested adding *gen.ta* 'with him' to the original text she and Sara co-produced during the writing stage (line 1), but this suggestion was not adopted by Sara (lines 2 and 4), and Kyoko accepted her decision (line 5). Although no change was

made after Kyoko suggested the sentence expansion, this interaction fell into this category, along with other interactions where actual changes were made.

Example 5.9 An LRE-grammar dealing with sentence expansion

(Original text: 马力 问 她 能 不 能 再 一起 吃饭。)
Mali wen ta neng-bu-neng zai yiqi chifan
Mali (name) ask her can-not-can again together eat.meal
Mali asked her if they could have dinner again.

1 Kyoko: Do we need 跟 他 一起 吃饭? <suggesting adding 跟 他>
gen ta yiqi chifan gen ta
with him together eat.meal with him
2 Sara: No:.
3 Kyoko: 一起 吃饭//is fine//?
yiqi chifan
together eat.meal
4 Sara: //yeah.//
5 Kyoko: Ok.

(Kyoko & Sara, co-writing, revision)

When one participant explained the meaning of a sentence to the other, the episode was coded as an LRE-grammar episode dealing with sentence meaning. In the following excerpt, Tina started reading a sentence in Mika's writing (line 1) and asked explicitly what it meant (line 3). Mika explained the meaning of part of her sentence (line 4). This explanation might have helped Tina develop a better understanding of the sentence, as seen in line 5 where Tina provided the meaning of the last part of the sentence Mika wrote.

Example 5.10 An LRE-grammar dealing with sentence meaning

(Original text: 他 现在 想 去 中国 旅行。)
ta xianzai xiang qu Zhongguo lüxing
he now want go China travel
Now he wants to go to China to travel.

1	Tina	"//他现-// ta xian- *he now*
2	Mika	"//他 现//在 想 去 中国 旅行。" ta xianzai xiang qu Zhongguo lüxing *he now* *want* *go* *China* *travel*
3	Tina	What does that mean again?
4	Mika	So now, he wanna, he wants to go to China.
5	Tina	To travel.
6	Mika	To travel.
7	Tina	Ok.

(Mika, peer review)

LRE-mechanics: Student negotiations dealing with characters/spelling, pinyin/spelling, pronunciation, or punctuation were coded as LRE-mechanics. Interactions focusing on characters/spelling and pinyin/spelling were coded as two separate subcategories because they dealt with different mechanical issues in Chinese writing. Mechanics-based LREs dealing with characters/spelling are episodes in which students spotted or corrected the spelling of characters in writing. Mechanics-based LREs dealing with pinyin/spelling are episodes in which students negotiated the spelling of pinyin to generate character prompts using the typing software. Examples 5.11 to 5.14 below are four examples of mechanics-based LREs.

When students negotiated the correct form of a character, or when a student did not recognize the character produced by their partner, the interaction episode was coded as an LRE-mechanics (character/spelling). In the following episode, Daeng read his sentence without realizing that he had made two spelling mistakes (line 1). Keiko spotted the first mistake and asked for clarification (line 2). When Daeng provided the pronunciation of

the character (line 3), Keiko was certain that he made a mistake and corrected it with Daeng's help on pinyin (lines 4-6). Then, she went ahead and changed the second character spelling mistake that Daeng had made in the sentence (line 6).

Example 5.11 An LRE-mechanics dealing with character/spelling

(Original text: 住 你 生日 快了。<two character spelling mistakes>)
zhu ni shengri kuaile
live you birthday fast
Intended meaning: "Happy birthday to you."
<There were two spelling mistakes in the sentence. (1) 住 should be 祝. The two characters are homophones, pronounced as *zhu*, but the first one means "to live" and the second one means "to wish". (2) 了 should be 乐. They are also homophones, pronounced as *le*, but the first one is often used as a grammatical particle, and the second means "happy" or "happiness".>

1	Daeng	"住 你：, 住 你 生日 快了" zhu ni:, zhu ni shengri kuaile *live you live you birthday fast*
2	Keiko	What's that? <pointed at 住>
3	Daeng	z-h-u.
4	Keiko	<deleted 住, and typed z>
5	Daeng	h and u.
6	Keiko	<found the right character of *zhu* "to wish" and corrected it.> "祝 你 zhu ni *wish you* 生日 快: 乐, 快，乐．" <changed 了to the correct form 乐> shengri kuai:le kuai le *birthday ha:ppy ha, ppy*

(Daeng, peer review)

When students explicitly spelled out pinyin, whether one student provided the pinyin of a character, or both negotiated the correct spelling of pinyin to obtain the correct characters, the episode was coded as an LRE-mechanics (pinyin/spelling). In Example 5.11 (repeated here as Example 5.12), for example, in lines 3 and 5, Daeng spelled the

pinyin of the word he wanted to use in his writing, letter by letter. This episode was coded as an LRE-mechanics dealing with pinyin/spelling.[9]

Example 5.12 An LRE-mechanics dealing with pinyin/spelling

(Original text: 住 你 生日 快了。<two character spelling mistakes>)
zhu ni shengri kuaile
live you birthday fast
Intended meaning: "Happy birthday to you."
<There were two spelling mistakes in the sentence. (1) 住 should be 祝. The two characters are homophones, pronounced as *zhu*, but the first one means "to live" and the second one means "to wish". (2) 了 should be 乐. They are also homophones, pronounced as *le*, but the first one is often used as a grammatical particle, and the second means "happy" or "happiness".>

1	Daeng	"住 你：, 住 你 生日 快了" zhu ni:, zhu ni shengri kuaile *live you live you birthday fast*
2	Keiko	What's that? <pointed at 住>
3	Daeng	z-h-u.
4	Keiko	<deleted 住, and typed z>
5	Daeng	h and u.
6	Keiko	<found the right character of *zhu* "to wish" and corrected it.> "祝 你 zhu ni *wish you* 生日 快: 乐, 快，乐．" <changed 了to the correct form 乐> shengri kuai:le kuai le *birthday ha:ppy ha, ppy*

(Daeng, peer review)

When an interactional episode dealt with pronunciation, either by self-correction or by other-correction, the episode was coded as an LRE-mechanics dealing with pronunciation. In the following episode, Rena read her own writing, but made a mistake in pronouncing a character, which she immediately corrected (line 1). At the same time,

Mark also provided the correct pronunciation of the character that Rena had mispronounced (line 2). Rena then confirmed that her intention was the correct pronunciation of the character (line 3).

Example 5.13 An LRE-mechanics dealing with pronunciation

(Original text: 他 对 中文 感 兴趣。)
ta dui Zhongwen gan xingqu
he to Chinese feel interest
He is interested in Chinese.

1 Rena Ok. "他 对 中文 有(1) 感 兴趣。"
ta dui Zhongwen you gan xingqu
he to Chinese have feel interest

<感 was not pronounced correctly. In addition, the text read 中国 *zhongguo* "China", not 中文 *Zhongwen* "Chinese", but Rena did not get it right when reading the sentence. >

感 兴趣// <self correcting the pronunciation>
gan xingqu
feel interest

2 Mark //感 兴趣 <correcting the pronunciation>
gan xingqu
feel interest

3 Rena Yeah, that's what I meant.

(Rena, peer review)

An episode that dealt with punctuation was coded as an LRE-mechanics (punctuation). The following example illustrates such LREs.[10]

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[9] This episode is an example of an embedded episode with two LREs-mechanics (character/spelling) and one LRE-mechanics (pinyin/spelling). See Example 5.20 for more explanation of an embedded episode.
[10] The episode was coded and counted as two LREs-mechanics (punctuation) because it addressed two different forms of punctuation, a colon and double quotation marks. This is also an example of an embedded LRE. See Example 5.20 for more explanation.

Example 5.14 An LRE-mechanics dealing with punctuation

(Original text: 他们 说’ 中国 很 好完的 地方。‘)
tamen shuo Zhongguo hen haowande difang
they say China very fun place
They said, "China is a fun place."
<There were two incorrect uses of punctuation and a spelling mistake.>

1	Mark	I think, I think your (.) 说 you need a colon. shuo *say*
2	Rena	Huh. <typing a semi-colon>
3	Mark	No, not that. <A semi colon was typed.> A colon, and a quotation, a double quote, an opening double quote.
4	Rena	(3) Ok. <fixed the punctuations>

(Rena, peer review)

5.1.2 Idea-related Episodes (IREs)

IREs are defined as the episodes in which students talk about ideas. According to cognitive writing process theory (Flower & Hayes, 1985), the writing process is a recursive idea-generating and regenerating process, and this process is observed in the data of the current study. Three subcategories of IRE (idea generation, idea organization, and idea synthesis)[11] were first developed, based on Storch (2003) and on the coding of transcripts for the pilot studies. However, these two categories were later merged into one IRE category because the majority of the IREs in the current study (90.5% of 74 such

[11] Storch (2003) divided IREs into three subcategories: an IRE-idea generation is when participants (re)generate new ideas and want to incorporate them in writing in the process of writing; an IRE-idea organization is when participants discuss the sequence of their ideas or sentences; and an IRE-idea

episodes) were IREs dealing with idea generation; only two IREs dealt with idea organization, while five concerned idea synthesis. The following are two examples of the IREs.

In the following episode, Rena developed new ideas while revising her writing with Mark's help. Initially, she wanted to rephrase her original sentence "His friends came to the library" to read "(his friends) *just* came to the library" (line 1). Mark suggested replacing "just" with "also", saying "his friends also came" (line 2). Rena incorporated Mark's suggestion and used 也 *ye* "also". At the same time, she generated a new idea. Instead of saying "his friends also came to the library", she wanted to say "his friends were also in the library." (line 3). Mark agreed with the newly generated idea (line 4), and Rena finalized the sentence, incorporating the new ideas developed in this interaction in line 5.

Example 5.15 An IRE dealing with idea generation

(Original text: 他的 朋友 过 图书馆 来。<incorrect>)
ta.de pengyou guo tushuguan lai
his friend over library come
Intended meaning: His friends came over to the library.

1	Rena	What about saying (.) just came. 就 去 图书馆 来? <incorrect> jiu qu tushuguan lai *just go library come*
2	Mark	Um (4) we could say that his friends ALSO came? I would not (2) worry.
3	Rena	他的 朋友(1) 也, what about 也? 也 在 图书馆。 ta.de pengyou ye ye ye zai tushuguan *his friend also also also at library*

---

synthesis is when participants summarize or synthesize a number of idea units previously developed into one sentence.

4 Mark Oh, yeah. They are both, they are also in the library.
5 Rena “朋友 也 在 图书馆。”
pengyou ye zai tushuguan
friend also at library

（Rena, peer review)

Unlike an LRE-grammar (sentence expansion), which concerns expanding or truncating a sentence within a sentence by adding or deleting a word, an IRE-idea synthesis is an episode above the sentence level. It involves synthesizing two sentences, or idea units, into one compound sentence. Thus, such episodes were coded as instances of IRE-synthesis. In the following except, in line 1, Mika suggested that the two sentences should be combined into one compound sentence because they shared the same subjects, and it would be redundant to keep the two sentences in Chinese. Tina accepted the idea (line 2). Mika was trying to be polite by not forcing Tina to accept her idea, but she provided her reasons for the suggested change (lines 3 and 5). Tina happily accepted the suggestion (line 4), and a change was made in line 6.

Example 5.16 An IRE dealing with idea synthesis

(Original text: 她 头发 长长的。 她 也 穿 得 真 漂亮。)
ta toufa changchangde ta ye chuan de zhen piaoliang
she hair long she also dress de very beautiful
Her hair was long. She was also dressed very beautifully.

1 Mika Maybe we can // Cuz we, like you say, we have too many 她-s, so maybe
ta
she
we can get them connect.
2 Tina Oh, yeah. [Laughing]
3 Mika Oh, it doesn’t matter. This way’s fine, but if you think there are too many 她-s，then maybe we can//
ta
she

4 Tina //Yeah. //
5 Mika //connect these two.
6 Tina Yep. <deleting the second 她, and by accident, 的 in the first second was deleted too.> Oops. <The problem was fixed>. Yeah.

(Mika & Tina, co-writing, revision)

5.1.3 Content-related Episodes (CREs)

CREs are those in which students talked about the content of writing (Storch, 2003) . Students sometimes discussed the given stimulus, i.e., the pictures, to seek or provide clarification of the details. The following is an example of a CRE. Two students were trying to clarify what time *Mali* got up in the morning by referring to the clock time in the picture.

Example 5.17 A content-related episode

1 Tim Ok, I like what you did there. Look at that. That IS 6: 30 when he gets up from bed.
2 Sue No, he's still sleeping. See he's out of bed THEN.
3 Tim Ok, fine, if that's you want to do.
4 Sue He was still sleeping. He was not yet up.
5 Tim Ok.

(Sue, peer review)

5.1.4 Text-reading Episodes (TREs)

When a participant simply read the text, including chunks of the text or whole texts, and/or his or her partner echoed or finished the reading with him/her, the episodes were

coded as “text reading episodes” (Storch, 2003). Although reading could take place silently, only instances of vocalized reading were coded. The following is an example of such an episode. Together, Keiko and Daeng read a sentence that Daeng wrote.

Example 5.18 A text-reading episode (TRE)

(Original text: 蛋糕 很 好吃。 我 吃 很多 菜。)
dangao hen haochi wo chi henduo cai
cake very delicious I eat many dishes
The cake was delicious. I ate a lot of dishes.

1 Keiko “蛋糕 很// 好吃”//
dangao hen haochi
cake very delicious

2 Daeng // “好吃// 我 吃 很多 (2) Um菜。”
haochi wo chi henduo cai
delicious I eat many dishes

(Daeng, peer review)

5.1.5 Text-assessing Episodes (TAEs)

When a participant assessed the quality of his/her partner’s text, including chunks of the text or the whole text, the episode was coded as a TAE. In Storch’s (2003) coding scheme, in addition to the assessment of writing, student negotiations relating to the assessment of each other’s writing skills were also classified as TAEs. However, in the current study, such negotiations were excluded from the TAE category, because they were not considered to be directly related to the demands of the task. The following episode is an example of a TAE. Rena initiated reading one of Mark’s sentences until she encountered a new word 努力 *nuli* ‘diligent’, where she paused (line 1). Mark finished

the second part of the sentence (line 2), which Rena repeated in line 3. Then Rena asked for confirmation of the meaning of the vocabulary. Mark confirmed the meaning (line 4). Rena, in line 5, commented on Mark's sentence and said it sounded very good.[12]

Example 5.19 A text-assessing episode (TAE)

(Original text: 马力 是 一 个 很 努力的 学生。
Mali shi yi ge hen nulide xuesheng
Mali be one M.W. very diligent student
Mali is a diligent student.

1	Rena	"马力 是 一 个 很: //" Mali shi yi ge hen *Mali be one M.W. very*
2	Mark	"努力// 的 学生。//" nuli de xuesheng *diligent student*
3	Rena	"//努力的 学生。//" 努力's like she's studying hard? nulide xuesheng nuli *diligent student diligent*
4	Mark	Yeah. She's really diligent.
5	Rena	Ok. That sounds good.

(Mark, peer review)

It is worth noting that the transcripts also yielded data that contained embedded episodes or interrupted episodes. When an episode dealt with two or three issues simultaneously, it was coded and counted as two or three episodes. The following episode (Example 5.11 and 5.12, which are repeated for the reader's convenience) contains two LREs-mechanics (character/spelling), focusing on *zhu* (住 vs. 祝) and *le* (了

[12] The episode was coded and counted as a TAE and an LRE-lexis (word meaning). This is also an example of an embedded LRE. See Example 5.20 for more explanation.

vs. 乐), respectively, and one LRE-mechanics (pinyin/spelling) focusing on the pinyin of *zhu*. This interaction was coded and counted as three episodes.

Example 5.20 An embedded episode (Example 5.11 & Example 5.12, repeated here as Example 5.20)

(Original text: 住 你 生日 快了。<two character spelling mistakes>)
zhu ni shengri kuaile
live you birthday fast
Intended meaning: "Happy birthday to you."
<There were two spelling mistakes in the sentence. (1) 住 should be 祝. The two characters are homophones, pronounced as *zhu*, but the first one means "to live" and the second one means "to wish". (2) 了 should be 乐. They are also homophones, pronounced as *le*, but the first one is often used as a grammatical particle, and the second means "happy" or "happiness".>

1	Daeng	"住 你:, 住 你 生日 快了" zhu ni:, zhu ni shengri kuaile *live you live you birthday fast*
2	Keiko	What's that? <pointed at 住>
3	Daeng	z-h-u.
4	Keiko	<deleted 住, and typed z>
5	Daeng	h and u.
6	Keiko	<found the right character of *zhu* "to wish" and corrected it.> "祝 你 zhu ni *wish you* 生日 快: 乐, 快，乐．" <changed 了to the correct form 乐> shengri kuai:le kuai le *birthday ha:ppy ha, ppy*

(Daeng, peer review)

The data also included instances in which participants began to discuss one issue and moved to another, but revisited the original issue after some exchanges. In such instances, the interrupted discussion of a single issue was counted as one episode. Example 5.5, repeated as Example 5.21 below for convenience, is an example of an interrupted

episode. The episode contains an interrupted LRE-grammar dealing with measure words and an interrupted LRE-mechanics dealing with character/spelling (incidentally, this interaction is also an example of an embedded episode). The episode starts with a discussion on the need for a measure word 一张 *yizhang* for 飞机票 *feijipiao* "plane ticket" in lines 2 and 3, and is interrupted by another LRE which deals with a character spelling mistake of *ji* in *feijipiao* "plane ticket" (line 4) before returning to finalize the decision on the use of the measure word in lines 5, 6 and 7. Similarly, after the interruption that deals with the measure word in lines 5, 6 and 7, the remainder of the episode (lines 7, 8, 9, and 10) resumes the discussion started in line 4 about the misspelling of the character of *ji* for 飞机票 *feijipiao* "plane ticket". This episode was coded and counted as two episodes.

Example 5.21 An interrupted episode (Example 5.5, repeated here as Example 5.21)

(Original text: 马力 去 卖 了 飞几票。)
mali qu mai le feiji.piao
Mali(name) go sell asp. plane.ticket
Intended meaning: Mali went to buy a plane ticket.
<The students were discussing the use of a measure word before *feijipiao* 'plane ticket'. In addition, there were two typos in the writing. The writer Sara had an intention to write 'to buy', but the character was spelt wrong, which meant 'to sell'. However, she read the character correctly as 'to buy' in the peer review interaction. Another typo was *ji* in *feijipiao* 'plane ticket', and it was pointed out by Kyoko in line 4 and corrected by Sara in line 7. >

1	Sara	"马力 去 卖 了(.) 飞几票。 他 想 二月" //	
		mali qu mai le feiji.piao ta xiang eryue	
		Mali(name) go sell asp. plane.ticket he want February	
2	Kyoko	//Or maybe you need a measure word for 飞机票。	
			feiji.piao
			plane.ticket

3	Sara	一 张// yi zhang *one M.W.*
4	Kyoko	//And 飞机票 的 机 是 a different character, I think. feiji.piao de ji shi *plane.ticket poss. machine be*
5	Sara	So 一 张, right? yi zhang *one M.W.*
6	Kyoko	Yeah.
7	Sara	一 (.) 张 <typing> 飞机 <typing the right character for 机>. This one, yi zhang feiji ji *one M.W. plane machine* right?
8	Kyoko	Yeah.
9	Sara	飞机票。 feiji.piao *plane.ticket*
10	Kyoko	Huh.

(Sara, peer review)

To ensure the reliability of transcribing student verbal interactions and coding, I used intra-coder and inter-coder checks. After the transcription convention was developed, I trained a second transcriber, who was a native speaker of Chinese and spoke fluent English. She and I transcribed one recording from the pilot study together, and then she transcribed another pilot study recording individually. I then reviewed her transcription with her and clarified the methodology, where necessary.

I transcribed five of the co-writing interaction recordings and nine of the peer review interaction recordings collected for the current study, and the trained transcriber transcribed the remaining recordings (four co-writing interaction recordings and nine peer review recordings). We then crosschecked each other's transcripts and made some

changes, as necessary. Three weeks later, I randomly selected 13 transcripts from out the total of 27, and went through our transcripts once again. Only a small number of changes were made to the transcripts as a result of this review.

When coding the transcripts, I first segmented all interaction into episodes. Further, I categorized the segmented episodes as on-, about-, or off-task episodes, only including on-task episodes for further analysis. This process helped ensure that the study results would reflect only the students' discussion of their writings.

The further categorization of student interaction into five categories (LREs, IREs, CREs, TAEs, and TREs) and more detailed sub-categories were developed in the course of coding the pilot study data. That is, the definitions of each category and sub-category were developed by coding the student interaction in both peer review and co-writing conditions in the current study, and an effort was made to ensure that the coding scheme was suitable for coding the student interactions in both writing conditions. The coding scheme was further fine-tuned when I started coding the transcripts in the current study because of some differences in student interaction due to the language proficiency discrepancy between students in the pilot studies (second- and third-year students) and in the current study (first-year students).

After transcripts were coded and coding categories and subcategories were defined, a second coder was trained, who was an M.A. graduate in applied linguistics, a native speaker of English who spoke fluent Chinese and had good experience in coding classroom interactions. We first coded one co-writing interaction and one peer review interaction in the current study together to familiarize her with the coding scheme. Then she coded one-third of transcriptions independently (three co-writing interactions and six

peer review interactions). Pearson correlation coefficients for the segmentation of episodes reached 1.00 agreement, and for the coding of episodes reached 0.92, a well-accepted agreement level. Any discrepancies were resolved through discussion.

Three weeks later, I re-coded the remaining two-thirds of the transcripts. Pearson correlation coefficients for the segmentation of episodes between the two times reached 1.00, and for the coding of episodes reached 0.96.

5.2 Results

Data for all categories and subcategories of on-task episodes were tabulated for analysis. This section reports the results of the analysis of on-task episodes, LREs, LRE-lexis, LRE-grammar, and LRE-mechanics, respectively.

5.2.1 On-task Episodes

Altogether 586 episodes were segmented in 18 transcripts of peer review interactions. Among them, 513 episodes (87.5%) were on-task episodes. In nine transcripts of co-writing interactions, there were 230 episodes, 198 (86.1%) of which were on-task episodes. On-task episodes accounted for similar percentage of all negotiation episodes in both interaction conditions, and the high percentage of on-task episodes suggested that students remained primarily focused on the task throughout the interactions.

Table 5.2 and Figure 5.1 below present the distribution of episodes with respect to the five categories of on-task episode. In the peer review condition, most on-task

episodes focused on LREs (71.7%), followed by text-reading episodes (16.2%). The interactions also included a similar proportion of idea-related episodes (4.3%) and content-related episodes (4.9%). Few episodes (2.9%) focused on text-assessment. In the co-writing condition,[13] more than half of on-task episodes were LREs (52%). Students also read their own texts frequently (24.2%). The analysis showed that in the co-writing condition, students were engaged in idea development more often (13.1%) than in the peer review condition. Also, there were more text-assessing episodes (8.6%) in the co-writing than in the peer review condition. However, only 2% of episodes were related to content, somewhat less than in the peer review condition.

Table 5.2 Distribution of on-task episodes in peer review and co-writing

	Peer Review		Co-writing	
	n	*%*	*n*	*%*
LREs	368	71.7%	206	52.0%
IREs	22	4.3%	52	13.1%
CREs	25	4.9%	8	2.0%
TREs	83	16.2%	96	24.2%
TAEs	15	2.9%	34	8.6%
Total	513	100%	396	100%

[13] For the sake of analysis, episodes in each pair talk in the co-writing condition were applied to both students. Thus, the numbers of episodes were doubled.

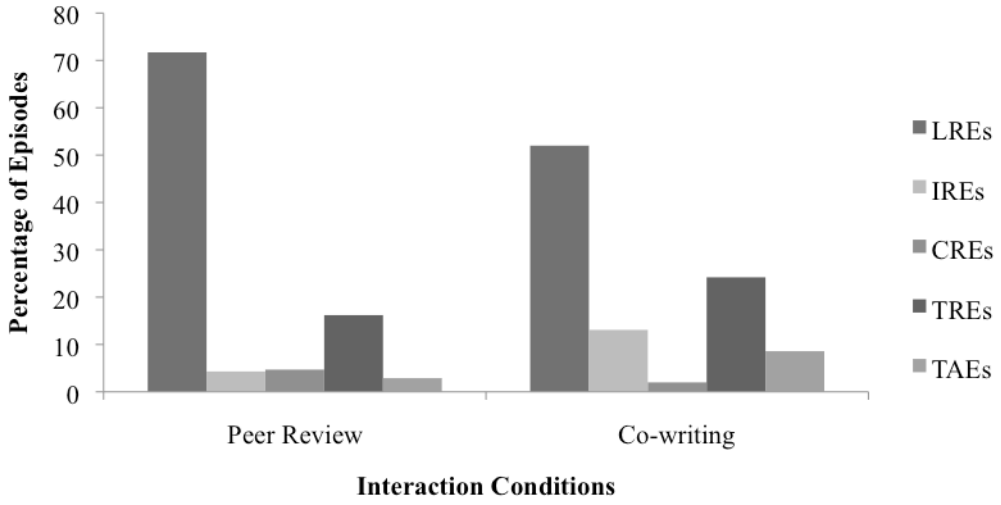

Figure 5.1 Distribution of on-task episodes in peer review and co-writing

Overall, students' interactions in discussing their writing were primarily focused on language-related issues. There were also a considerable number of episodes where students read their peers' or their joint writings. Apart from these two most commonly covered areas of discussion, the distribution of on-task episodes in the other three areas was quite different. In peer review, students spent similar, but limited, amount of attention in clarifying content and developing ideas, and very little attention to assessing their peers' writing. These findings suggest that students were reluctant to assume an evaluator role at a more global level when reading their peers' writing. In co-writing, however, students focused more on idea development and assessment of their co-writing products, suggesting that they had a stronger sense of ownership of their co-production. They directed very little attention to clarifying content, perhaps because they had already discussed the stimuli in the pictures in the brainstorming and writing stages, leaving few content-related questions to be raised in the revision stage.

Before the on-task episodes were further compared in peer review versus co-writing interactions, Kolmogorov-Smirnov tests were performed on total episodes and on-task episodes, as well as on five types of on-task episodes, to examine whether the data were normally distributed. As shown in Table 5.3 below, the data in the total episodes, on-task episodes, and LREs were normally distributed ($p > .05$). Thus, paired samples t-tests were used for data analysis. However, the distribution of data in the IREs, CREs, TREs, and TAEs were significantly non-normal ($p < .05$). Therefore, non-parametric Wilcoxon signed ranks tests were used for analysis of the data.

Table 5.3 Normality analysis of on-task episodes in peer review and co-writing

Episodes	Conditions	Normality
Total episodes	Peer review condition	$D(18) = .182, p > .1$
	Co-writing condition	$D(18) = .162. p > .2$
On-task episodes	Peer review condition	$D(18) = .202, p > .05$
	Co-writing condition	$D(18) = .126, p > .2$
Language-related episodes	Peer review condition	$D(18) = .182, p > .1$
	Co-writing condition	$D(18) = .168, p > .1$
Idea-related episodes	Peer review condition	$D(18) = .321, p < .01^*$
	Co-writing condition	$D(18) = .255, p < .01^*$
Content-related episodes	Peer review condition	$D(18) = .288, p < .01^*$
	Co-writing condition	$D(18) = .403, p < .01^*$
Text-reading episodes	Peer review condition	$D(18) = .235, p < .01^*$
	Co-writing condition	$D(18) = .217, p < .03^*$
Text-assessing episodes	Peer review condition	$D(18) = .312, p < .01^*$
	Co-writing condition	$D(18) = .225, p < .02^*$

Table 5.4 and Figure 5.2 present results of paired samples t-tests examining total episodes, on-task episodes, and LREs. The results show that more episodes were

generated in the peer review condition than in the co-writing condition with respect to the total number of episodes (32.56 vs. 25.56), on-task episodes (28.5 vs. 22) and LREs (20.44 vs. 11.44). When t-tests were performed, no statistically significant difference between the two conditions was found for the total number of episodes, $t(18) = 1.98$, $p = .064$; the difference in on-task episodes between the two conditions approached significance, $t(18) = 2.08$, $p = .053$; and the difference in LREs reached statistical significance, $t(18) = 3.42$, $p = .003$. These results suggest that although the total number of episodes during student interaction in the revision stages did not differ significantly between the two collaborative writing conditions, the peer review condition featured many more on-task episodes and significantly more LREs in the peer review condition than the co-writing condition.

Table 5.4 Paired samples t-tests: Total episodes, on-task episodes, and LREs in peer review and co-writing

	Total Episodes		On-task Episodes		LREs	
	PE	CO	PE	CO	PE	CO
N	18	18	18	18	18	18
Max	64	39	56	34	46	20
Min	8	10	5	9	2	6
Mean	32.56	25.56	28.50	22.00	20.44	11.44
s.d.	14.38	10.06	13.43	8.57	11.69	4.12
t	1.98		2.08		3.42	
p	.064		.053		.003*	

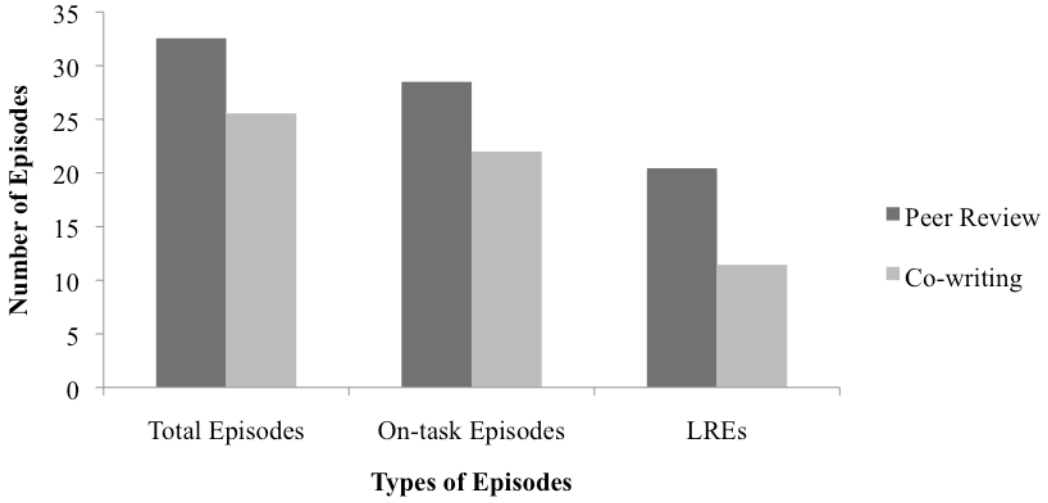

Figure 5.2 Total episodes, on-task episodes, and LREs in peer review and co-writing

Results of non-parametric Wilcoxon signed ranks tests examining IREs, CREs, TREs, and TAEs are shown in Table 5.5 and Figure 5.3. The results show that there were more episodes generated in the peer review condition than in the co-writing condition with respect to CREs (1.33 vs. 0.44), and the differences were statistically significant, $Z = -2.17$, $p < .05$. On the other hand, more episodes were generated in the co-writing condition than in the peer review condition with respect to IREs (2.89 vs. 1.22), TREs (5.33 vs. 4.61), and TAEs (1.89 vs. 0.83). The two conditions produced statistically significant differences in the number of idea-related episodes ($Z = -3.04$, $p < .01$), and text-assessing episodes ($Z = -2.55$, $p < .02$). However, the two writing conditions did not elicit a statistically significant difference in text-reading episodes ($Z = -0.51$, $p > .5$). These results indicate that co-writing generated significantly more IREs and TAEs than did peer review, whereas there were more discussion on CREs in the peer review

condition than in co-writing. There were a similar number of text-reading episodes between the two conditions.

Table 5.5 Non-parametric test: IREs, CREs, TREs, and TAEs in peer review and co-writing

	IREs		CREs		TREs		TAEs	
	PE	CO	PE	CO	PE	CO	PE	CO
N	18	18	18	18	18	18	18	18
Max	8	6	4	2	12	14	4	6
Min	0	1	0	0	0	0	0	0
Mean	1.22	2.89	1.39	0.44	4.61	5.33	0.83	1.89
s.d.	2.05	1.91	1.38	0.71	3.45	4.37	1.2	2.21
Z	-3.04		-2.17		-.51		-2.55	
p	.002*		.030*		.608		.011*	

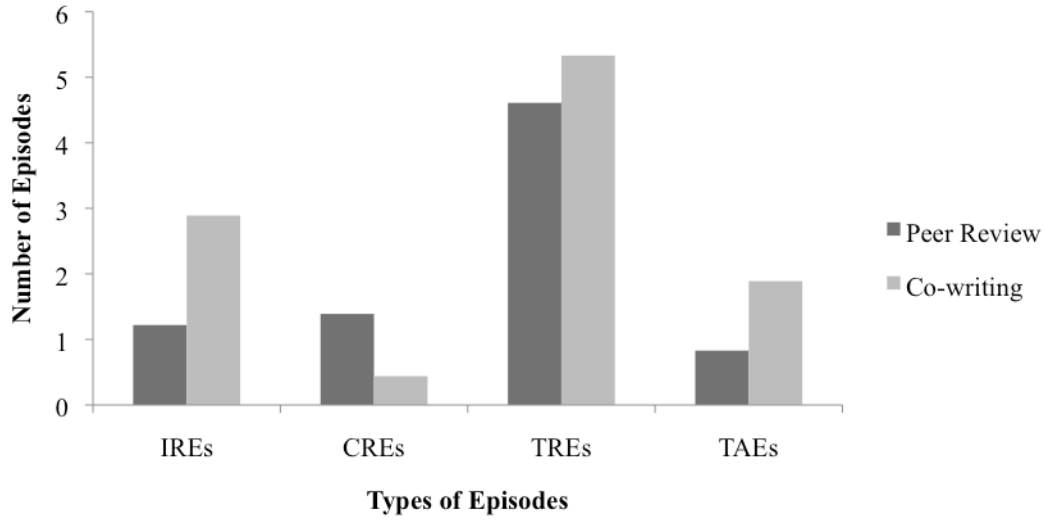

Figure 5.3 IREs, CREs, TREs, and TAEs in peer review and co-writing

5.2.2 Language-related Episodes

Results of descriptive analysis of three categories of LREs (LRE-lexis, LRE-grammar, and LRE-mechanics) are presented in Table 5.6 and Figure 5.4. In peer review interactions students focused most on LRE-grammar (40.2%), and slightly less on LRE-mechanics (37%). The least attended to LRE type was LRE-lexis, with only 22.8% of episodes. A similar trend was also observed in co-writing interactions. Students' interaction was likely to be directed to LRE-grammar and LRE-mechanics (40.8% each), and less to LRE-lexis (only 18.4%).

Table 5.6 Distribution of LREs in peer review and co-writing

	Peer Review		Co-writing	
	n	*%*	*n*	*%*
LRE-lexis	84	22.8%	38	18.4%
LRE-grammar	148	40.2%	84	40.8%
LRE-mechanics	136	37.0%	84	40.8%
Total	368	100%	206	100%

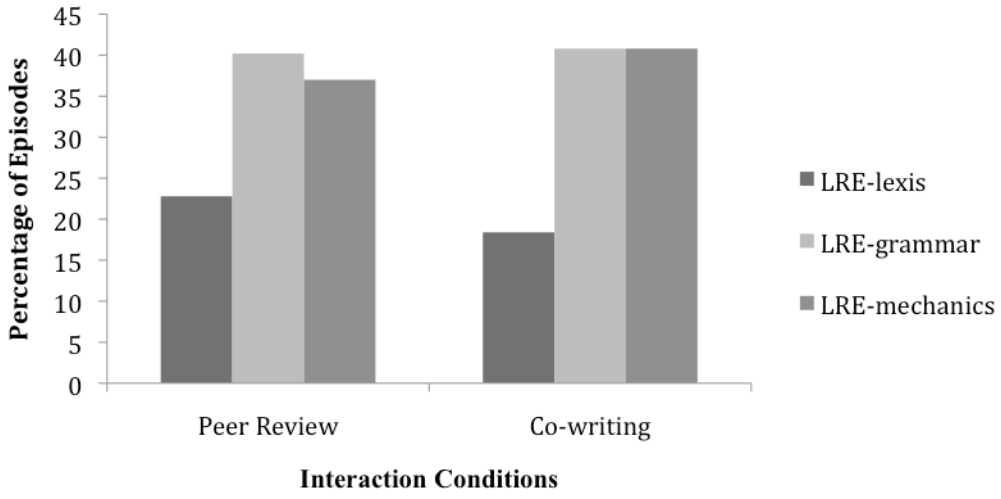

Figure 5.4 Distribution of LREs in peer review and co-writing

Before statistic analyses of LRE-lexis, LRE-grammar, and LRE-mechanics were conducted, normality of the data distribution was explored, and results are reported in Table 5.7. The analysis showed that the data of all three types of LREs were significantly non-normal ($p < .01$). Therefore, non-parametric Wilcoxon signed ranks tests were employed for data analysis.

Table 5.7 Normality analysis of LREs in peer review and co-writing

Episodes	Conditions	Normality
LRE-lexis	Peer review condition	$D(18) = .249, p < .01^{*}$
	Co-writing condition	$D(18) = .314. p < .01^{*}$
LRE-grammar	Peer review condition	$D(18) = .266, p < .01^{*}$
	Co-writing condition	$D(18) = .126, p > .2$
LRE-mechanics	Peer review condition	$D(18) = .151, p < .01^{*}$
	Co-writing condition	$D(18) = .251, p < .01^{*}$

Results are presented in Table 5.8 and Figure 5.5. As shown, a greater number of episodes were found in peer review than in co-writing across all three subcategories of language-related episodes: LRE-lexis (4.67 vs. 2.11), LRE-grammar (8.22 vs. 4.67), and LRE-mechanics (7.56 vs. 4.67). The differences were statistically significant for LRE-lexis ($Z = -2.70$, $p < .01$) and LRE-grammar ($Z = -2.87$, $p < .01$), but not for LRE-mechanics ($Z = -1.12$, $p > .2$). These results indicate that students directed significantly more attention to lexis and grammar in peer review than in co-writing, and similar amount of attention to mechanics in both interaction conditions.

Table 5.8 Non-parametric test: LRE-lexis, LRE-grammar, LRE-mechanics in peer review and co-writing

	LRE-lexis		LRE-grammar		LRE-mechanics	
	PE	CO	PE	CO	PE	CO
N	18	18	18	18	18	18
Max	10	5	20	7	22	10
Min	1	1	1	2	0	1
Mean	4.67	2.11	8.22	4.67	7.56	4.67
s.d.	3.20	1.23	4.57	1.82	7.50	3.25
Z	-2.70		-2.87		-1.12	
p	.007*		.004*		.265	

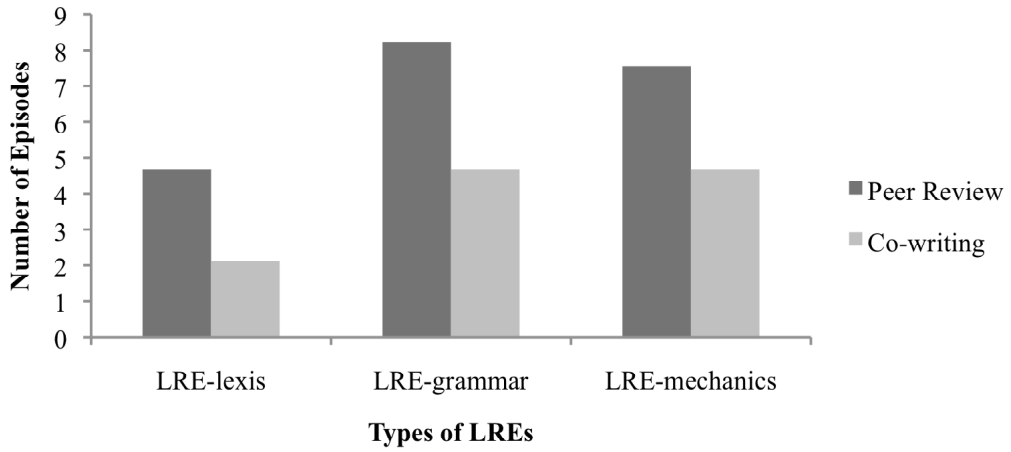

Figure 5.5 LRE-lexis, LRE-grammar, LRE-mechanics in peer review and co-writing

5.2.3 LRE-lexis Episodes

Two subcategories of LRE-lexis observed were word choice and word meaning. The number and percentage of episodes in each subcategory in both conditions are shown in Table 5.9 and Figure 5.6. In both peer review and co-writing interactions, there were more episodes relating to word meaning (75% and 68.%, respectively) than to word choice (25% and 31.6%, respectively), suggesting that students had different levels of mastery of vocabulary and that often, students had trouble understanding the meaning of words that their peers wrote or offered in interaction. The relatively limited number of word choice episodes, on the one hand, suggests that students at this level were not skilful enough to make choices from their vocabulary inventory; on the other hand, it also suggests that students were willing to try out new words.

Table 5.9 Distribution of LRE-lexis in peer review and co-writing

	Peer Review		Co-writing	
	n	%	*n*	%
Word Choice	21	25%	12	31.6%
Word Meaning	63	75%	26	68.4%
Total	84	100%	38	100%

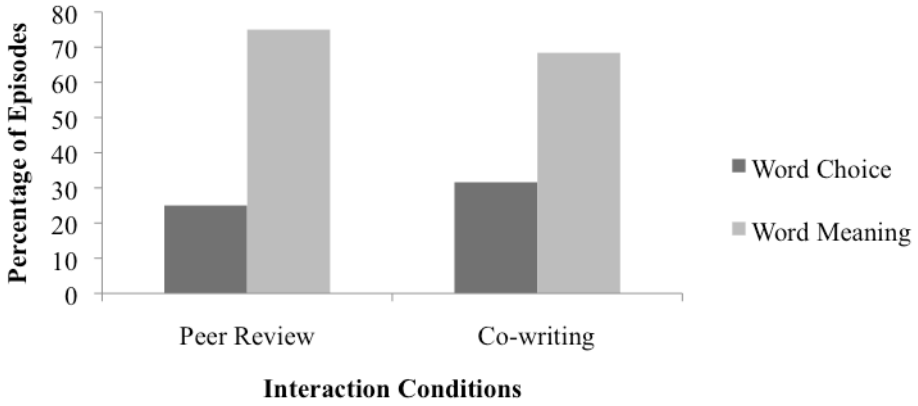

Figure 5.6 Distribution of LRE-lexis in peer review and co-writing

To compare word choice and word meaning episodes in peer review and in co-writing, the data were first examined for their normality distribution. It was found, as seen in Table 5.10, that the data distributions of word choice episodes and word meaning episodes were significantly non-normal, $p < .01$. Thus, non-parametric Wilcoxon signed ranks tests were used for further comparison.

Table 5.10 Normality analysis of LRE-lexis in peer review and co-writing

Episodes	Conditions	Normality
Word Choice	Peer review condition	$D(18) = .245, p < .01^*$
	Co-writing condition	$D(18) = .421. p < .01^*$
Word Meaning	Peer review condition	$D(18) = .177, p > .1$
	Co-writing condition	$D(18) = .286, p < .01^*$

Table 5.11 and Figure 5.7 present the results of the comparison of word choice and word meaning episodes in the two collaborative writing conditions. Results show that more word choice and more word meaning episodes emerged in the peer review (1.17 and 3.50) than in the co-writing interaction (0.67 and 1.44). For word choice episodes, the difference was not statistically significance ($Z = -1.81$, $p > .05$). However, a statistically significant difference was observed in word meaning episodes between the two conditions ($Z = -2.31$, $p < .05$). These results demonstrate that students in peer review interaction focused significantly more on word meaning discussion than in co-writing interaction, and that they did not show much difference in discussion of word choices between the two conditions.

Table 5.11 Non-parametric tests: Word choice, word meaning episodes in peer review and co-writing

	Word Choice		Word Meaning	
	PE	CO	PE	CO
N	18	18	18	18
Max	3	1	10	5
Min	0	0	0	0
Mean	1.17	0.67	3.50	1.44
s.d.	1.10	0.49	3.13	1.46
Z	-1.81		-2.31	
p	.07		.02*	

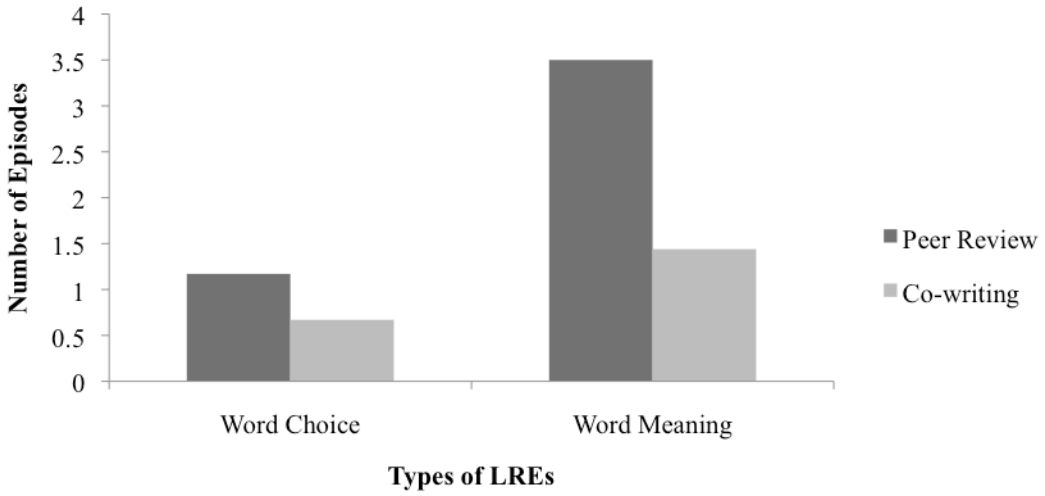

Figure 5.7 Word choice and word meaning episodes in peer review and co-writing

In summary, when students negotiated on LRE-lexis, they focused more on word meaning than on word choice in both the peer review and co-writing conditions. Significantly more episodes were observed in peer review than in co-writing interaction in the case of word meaning, but not in the case of word choice. These results suggest that the high-beginner students mastered different vocabulary in their language learning process despite attending the same class. It is expected that such interaction would expose the students to various words that they had learned but not yet mastered.

5.2.4 LRE-grammar Episodes

LRE-grammar episodes were observed with the highest frequency in both peer review and co-writing interactions. These interactions also covered a wide range of topics, including verb forms, measure words, word usage, linking devices, sentence structure,

sentence/phrase meaning, and sentence expansion. The number and percentage of episodes in each subcategory for both conditions are reported in Table 5.12 and Figure 5.8. In peer review, the most frequently visited grammar episodes arose when students discussed sentence or phrase meanings (38.5%), followed by word usage (21.6%), verb forms (17.6%), and sentence expansion (9.5%). Little attention was paid to sentence structures (6.8%), linking devices (3.4%), and measure words (2.7%). In co-writing, two types of interaction attracted students' equal attention most frequently: sentence/phrase meanings and sentence expansion (23.8% each). Students also paid more attention to word usage (19.1%) and sentence structures (14.3%) than to other topics, such as verb forms (9.5%), measure words (7.1%), and linking devices (2.4%).

Table 5.12 Distribution of LRE-grammar in peer review and co-writing

	Peer Review		Co-writing	
	n	*%*	*n*	*%*
Verb Form	26	17.6%	8	9.5%
Word Usage	32	21.6%	16	19.1%
Measure Word	4	2.7%	6	7.1%
Linking Device	5	3.4%	2	2.4%
Sentence Structure	10	6.8%	12	14.3%
Sentence/Phrase Meaning	57	38.5%	20	23.8%
Sentence Expansion	14	9.5%	20	23.8%
Total	148	100%	84	100%

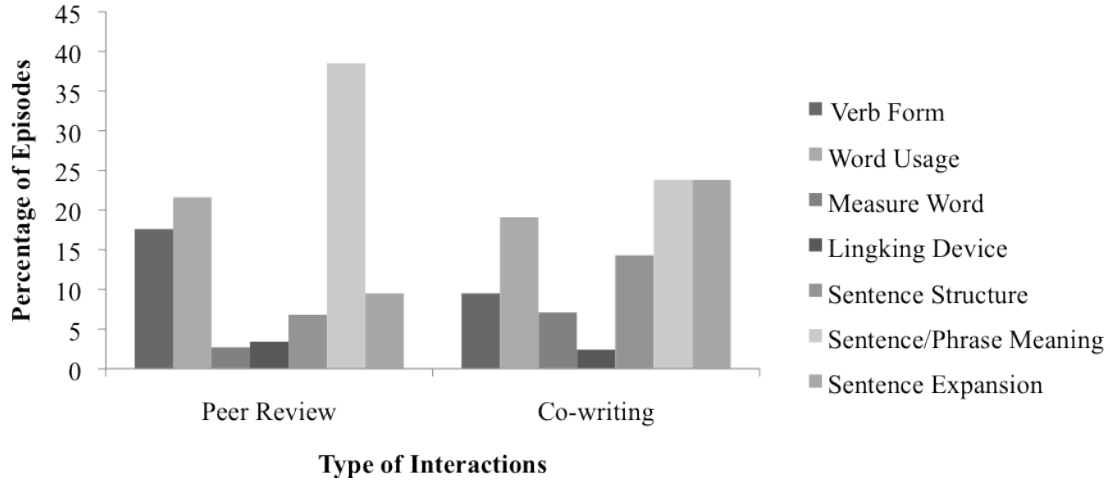

Figure 5.8 Distribution of LRE-grammar in peer review and co-writing

Before the seven subcategories of LRE-grammar were further compared in peer review and in co-writing, the data were first examined for their normality distribution. As seen in Table 5.13, which reports the results of the normality analysis, one of the two *p* values in each subcategory was less than .01, suggesting the data in all seven sub-categories were significantly non-normal. Thus, non-parametric Wilcoxon signed ranks tests were used for further comparison.

Table 5.13 Normality analysis of LRE-grammar in peer review and co-writing

Episodes	Conditions	Normality
Verb Form	Peer review condition	$D(18) = .185, p > .1$
	Co-writing condition	$D(18) = .363, p < .01^{*}$
Word Usage	Peer review condition	$D(18) = .196, p > .05$
	Co-writing condition	$D(18) = .252, p < .01^{*}$
Measure Word	Peer review condition	$D(18) = .476, p < .01^{*}$
	Co-writing condition	$D(18) = .464, p < .01^{*}$
Linking Device	Peer review condition	$D(18) = .503, p < .01^{*}$
	Co-writing condition	$D(18) = .523, p < .01^{*}$
Sentence Structure	Peer review condition	$D(18) = .372, p < .01^{*}$
	Co-writing condition	$D(18) = .421, p < .01^{*}$
Sentence/Phrase Meaning	Peer review condition	$D(18) = .328, p < .01^{*}$
	Co-writing condition	$D(18) = .210. p < .05^{*}$
Sentence Expansion	Peer review condition	$D(18) = .381, p < .01^{*}$
	Co-writing condition	$D(18) = .309, p < .01^{*}$

Table 5.14 and Figure 5.9 present the results of the comparison of the seven subcategories of LRE-grammar episodes in the two collaborative writing conditions. The results demonstrate that more verb form, word usage, linking device, and sentence/phrase meaning episodes emerged in peer review interaction than in co-writing interaction. Wilcoxon signed ranks tests revealed that statistically significant differences were observed in three types of episode: verb form ($Z = -2.39$, $p < .02$), word usage ($Z = -1.94$, $p < .05$), and sentence/phrase meaning ($Z = -2.29$, $p < .02$). For linking device episodes, the difference failed to reach statistical significance ($Z = -0.38$, $p > .05$). Conversely, in co-writing interactions, there were more measure word, sentence structure, and sentence expansion episodes than in the peer review condition. However, these differences were

not statistically significant, with the *p* values greater than 0.4 for all three types of episode.

Table 5.14 Non-parametric tests: Subcategories of LRE-grammar in peer review and co-writing

Episodes	Conditions	N	Max	Min	Mean	s.d.	*Z*	*p*
Verb Form	Peer review	18	5	0	1.44	1.38	-2.39	.02*
	Co-writing	18	1	0	0.44	0.51		
Word Usage	Peer review	18	4	0	1.78	1.52	-1.94	.05*
	Co-writing	18	3	0	0.89	1.02		
Measure Word	Peer review	18	1	0	0.22	0.43	-0.63	.53
	Co-writing	18	2	0	0.33	0.69		
Linking Device	Peer review	18	4	0	0.28	0.96	-0.38	.71
	Co-writing	18	1	0	0.11	0.32		
Sentence Structure	Peer review	18	2	0	0.56	0.78	-0.36	.72
	Co-writing	18	2	0	0.67	0.97		
Sentence/Phrase Meaning	Peer review	18	16	0	3.17	4.37	-2.29	.02*
	Co-writing	18	3	0	1.11	1.02		
Sentence Expansion	Peer review	18	6	0	0.78	1.40	-0.73	.47
	Co-writing	18	4	0	1.11	1.41		

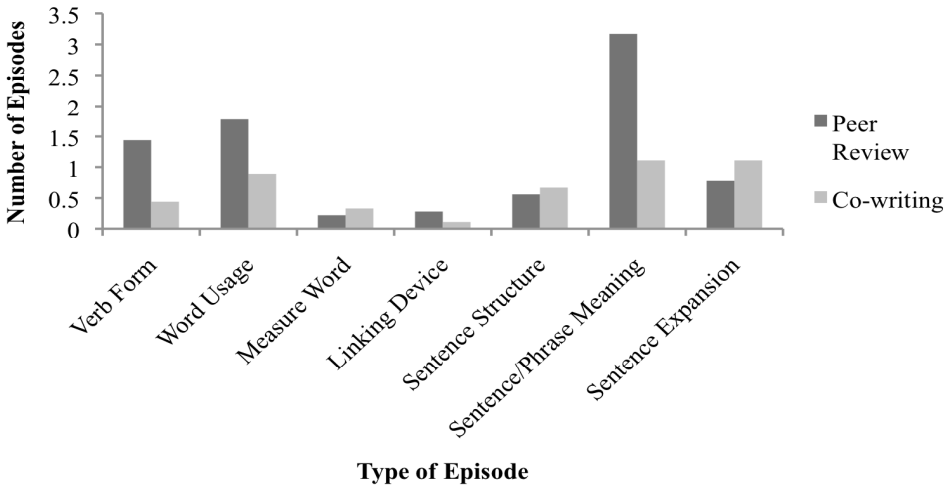

Figure 5.9 Subcategories of LRE-grammar episodes in peer review and co-writing

To sum up, in both peer review and co-writing interaction on grammar, the most frequently observed episodes were sentence/phrase meanings, revealing that students needed to seek clarification when they encountered difficulties understanding the meanings of sentences or phrases. Significantly more such episodes were observed in peer review than in co-writing, suggesting that students had different levels of command of the language, and thus encountered more cases where they did not understand their peers' writing. In addition, significantly more verb form and word usage episodes occurred in peer review than in co-writing, indicating that the opportunity to read their peers' writing resulted in more questions about these two aspects of grammar. With respect to measure words and linking devices, no statistically significant differences were observed between the two conditions, which is likely due to very limited occurrences of these grammatical devices in the students' writing, indicating that the high-beginner students were not linguistically ready to use these grammatical resources in either writing condition. In terms of interactions on sentence structure and sentence expansions, although the differences were not significant between the two writing condition, there was a trend that more episodes were found in co-writing than in peer review, indicating that students were more likely to attend to global issues in co-writing than in peer review.

5.2.5 LRE-mechanics Episodes

A considerable number of LRE-mechanics episodes were observed in both peer review and co-writing interactions, spanning a range of foci, including character/spelling,

pinyin/spelling, pronunciation, and punctuation. The number and percentage of episodes for each subcategory in both conditions are reported in Table 5.16 and Figure 5.11.

In peer review and co-writing, students discussed characters most frequently (56.6% and 52.4%, respectively). The three other LRE-mechanics episodes showed different patterns between conditions. When reading their peers' writing, students discussed pinyin (19.1%), punctuation (14.7%), and pronunciation (9.6%). When reading their joint writing, students focused more on punctuation (23.8%) and pronunciation (16.7%) than on pinyin (7.1%).

Table 5.15 Distribution of LRE-mechanics in peer review and co-writing

	Peer Review		Co-writing	
	n	*%*	*n*	*%*
Character/Spelling	77	56.6%	44	52.4%
Pinyin/Spelling	26	19.1%	6	7.1%
Pronunciation	13	9.6%	14	16.7%
Punctuation	20	14.7%	20	23.8%
Total	136	100%	84	100%

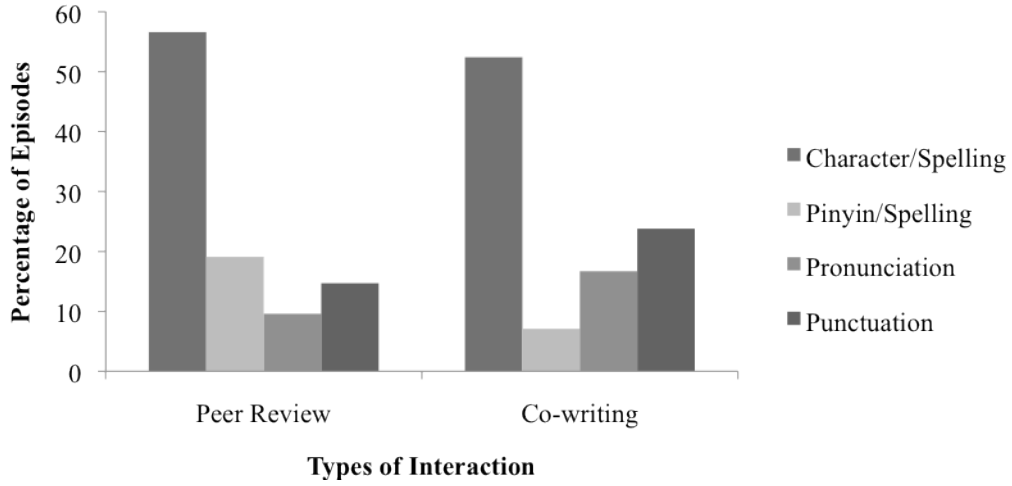

Figure 5.10 Distribution of LRE-mechanics in peer review and co-writing

Before the four LRE-mechanics episodes were compared in peer review and co-writing, the normality distribution of data was examined, the results of which are presented in Table 5.17. The analysis showed that at least one of the two *p* values in each subcategory was less than .05, suggesting the data were significantly non-normal. Thus, non-parametric Wilcoxon signed ranks tests were used for further comparison.

Table 5.16 Normality analysis of LRE-mechanics in peer review and co-writing

Episodes	Conditions	Normality
Character/Spelling	Peer review condition	$D(18) = .213, p < .03^{*}$
	Co-writing condition	$D(18) = .182, p > .1$
Pinyin/Spelling	Peer review condition	$D(18) = .297, p > .01^{*}$
	Co-writing condition	$D(18) = .421, p < .01^{*}$
Pronunciation	Peer review condition	$D(18) = .290, p < .01^{*}$
	Co-writing condition	$D(18) = .351. p < .01^{*}$
Punctuation	Peer review condition	$D(18) = .390, p < .01^{*}$
	Co-writing condition	$D(18) = .304, p < .01^{*}$

Table 5.18 and Figure 5.12 below present the results of the comparison of the four subcategories of LRE-mechanics episodes in the two interaction conditions. It is shown that more character and pinyin episodes emerged in peer review (4.28 and 1.44) than in co-writing (2.44 and 0.33). Wilcoxon signed ranks tests showed a statistically significant difference existed in pinyin/spelling episodes ($Z = -1.98$, $p < .05$), and the difference between conditions on character/spelling approached significance ($Z = -1.86$, $p = .06$). A similar number of punctuation episodes and the same number of pronunciation episodes arose in both interaction conditions. Wilcoxon signed ranks tests confirmed that the difference was very small, with both p values being over 0.7. The results suggest that students paid significantly more attention to spelling in peer review than in co-writing, and paid equal attention to punctuation and pronunciation issues in both conditions.

Table 5.17 Non-parametric tests: Subcategories of LRE-mechanics in peer review and co-writing

Episodes	Conditions	N	Max	Min	Mean	s.d.	*Z*	*p*
Character/Spelling	Peer review	18	12	0	4.28	4.06	-1.86	.06
	Co-writing	18	7	0	2.44	2.28		
Pinyin/Spelling	Peer review	18	11	0	1.44	2.71	-1.98	.05*
	Co-writing	18	1	0	0.33	0.49		
Pronunciation	Peer review	18	3	0	0.72	0.90	-0.27	.79
	Co-writing	18	2	0	0.78	0.94		
Punctuation	Peer review	18	8	0	1.11	2.56	-0.36	.72
	Co-writing	18	5	0	1.11	1.71		

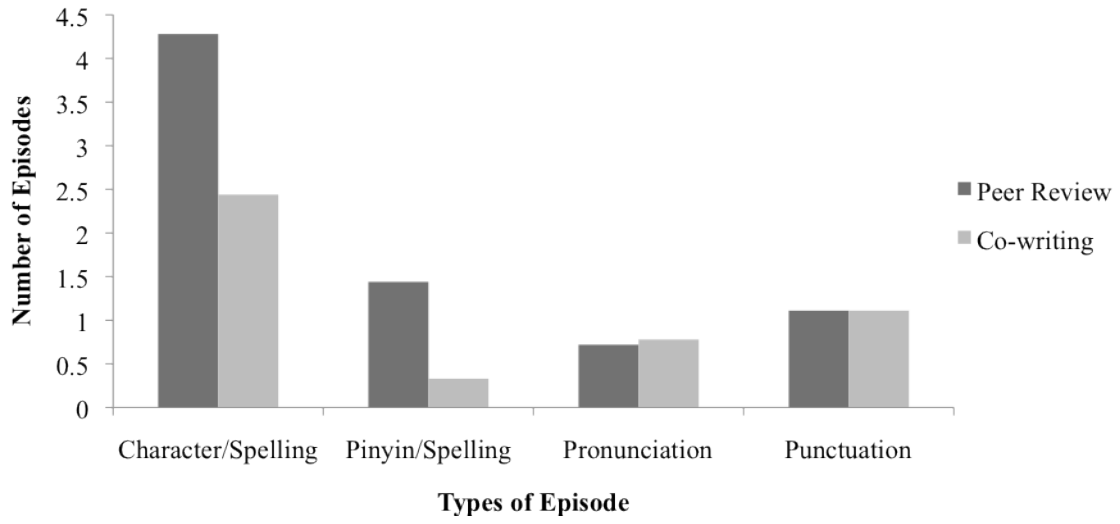

Figure 5.11 Subcategories of LRE-mechanics episodes in peer review and co-writing

5.3 Summary

This chapter first described how students' interactions in revising their texts in peer review and co-writing were analyzed and then reported on what types of interaction occurred. It was found although there were more episodes in peer review than in co-writing, this difference was not significant, suggesting the two interaction conditions elicited a similar number of negotiation episodes. Students stayed on task most of the time, as indicated by the fact that over 86% of all episodes in the interactions were on-task episodes in both writing conditions. Five types of on-task episodes were identified: Language-related episodes (LREs), idea-related episodes (IREs), content-related episodes (CREs), text-reading episodes (TREs), and text-assessing episodes (TAEs). Peer review generated significantly more LREs and CREs, whereas co-writing elicited significantly

more IREs and TAEs. No statistically difference was found in the occurrence of TREs between the two conditions. These results suggest that students were more likely to attend to language forms and content clarifications in peer review than in co-writing, whereas they paid more attention to idea development and assumed more ownership of their jointly produced texts in co-writing.

LREs were further divided into three categories: LRE-lexis, LRE-grammar, and LRE-mechanics. In both writing conditions, students focused more on LRE-grammar and LRE-mechanics than on LRE-lexis. When the two interaction conditions were compared, significantly more LRE-lexis and LRE-grammar were observed in peer review than in co-writing, suggesting that students encountered more issues relating to lexis and grammar in their peer review discussions, probably because of the different uses of language in their independently developed writings. Meanwhile, although more LRE-mechanics occurred in peer review than in co-writing, the difference was not significant, suggesting that students paid equal attention to writing mechanics in both interaction conditions.

Subcategories of the three types of LREs were analyzed as well. For LRE-lexis, students engaged in more discussion of word meaning than word choice in both interaction conditions. When the two conditions were compared, it was found that peer review resulted in significantly more episodes relating to word meaning than co-writing, but the difference between conditions with respect to word choice was not significant. These results illustrate that the students' mastery of vocabulary varied greatly, so they had difficulty in interpreting their peers' writing when they were exposed to it. The limited number of discussions of word choice in both conditions indicate that students at

this level were not sufficiently competent to make choices among their vocabulary inventory, regardless of the kind of interaction they were involved in.

For LRE-grammar, seven subcategories were employed to analyze the data. The most frequently observed episodes were sentence/phrase meanings in both interaction conditions. Analysis also showed that peer review resulted in significantly more sentence/phrase meaning, verb form, and word usage episodes than co-writing, demonstrating students' varying degrees of mastery of the language, with the result that they encountered more difficulty understanding their peers' independently developed writing, recalling the results obtained for LRE-lexis. Similarly, in the peer review condition, students produced more questions with regard to verb forms and word usage relating to their peers' texts as well. Very limited occurrences of measure word and linking device episodes occurred in both interaction conditions, possibly accounting for the absence of statistically significant differences between conditions for these types of episode. Although co-writing led to more interactions on sentence structures and sentence expansions than peer review, the differences were not significant, which may reflect students' limited linguistic competence at this level.

For LRE-mechanics, peer review aroused more spelling discussions than co-writing. The difference on pinyin/spelling was significant, and the difference on character/spelling approached significance. These results suggest that students may produce more spelling errors when they write independently, and that in the co-writing condition, such errors may be corrected at earlier, i.e., during the writing stage. Similar or identical numbers of punctuation and pronunciation episodes occurred in both interaction conditions,

suggesting that the peer review and co-writing had little impact on punctuation and pronunciation issues.

CHAPTER SIX – DATA ANALYSIS AND RESULTS: STUDENT PERCEPTIONS OF INDIVIDUAL WRITING, CO-WRITING, AND PEER REVIEW

This chapter addresses the third and final research question—namely, how students perceive the three writing conditions in this study: individual writing, co-writing and peer review. Four questionnaires were administered to gather students' perceptions. This chapter first describes the data analysis, and then reports the results of the quantitative analysis of the ranking scale component in the preference questionnaire and the qualitative analysis of all open-ended questions. The chapter ends with a summary of the findings.

6.1 Data Analysis

All participants completed four different questionnaires (Appendices 3 and 4), which were distributed to them at different times: one after they had completed each of the three writing tasks, for a total of three, and a fourth after they had completed all tasks. Altogether, 72 questionnaires were collected (18 x 4 = 72).

The ranking scale component in the fourth questionnaire was analyzed quantitatively, using SPSS 17.0. The open-ended components in all four questionnaires sought students' positive and negative perceptions of each writing task and were analyzed qualitatively. The students' answers to the open-ended questions were read repeatedly to generate common themes for analysis. That is, the themes and coding categories in the current study were not pre-determined, but emerged from a close examination of the data

(Bogdan & Biklen, 1992). Themes varied greatly among the three writing conditions, so the categorized themes are described below, along with results found in three conditions.

Both intra-coder and inter-coder checks were used when analyzing the qualitative data of questionnaires to ensure the reliability of coding. Firstly, the open-ended answers to the questionnaires used in the pilot studies were read recursively, and common themes were generated. Then, these themes were tested by coding three randomly selected questionnaires in the main study to determine their applicability. After fine-tuning the coding categories, I coded all 72 questionnaires, and three weeks later, I re-coded 36 randomly selected questionnaires, or one-half in total. The intra-coder reliability reached 98.2% agreement.

A second coder was trained by examining four pilot study questionnaires with me. She then coded 36 randomly selected questionnaires in the current study. The inter-coder reliability reached 95% agreement. Any discrepancies in coding were resolved through discussion.

6.2 Results

The results of the questionnaire analysis are reported in two sections: the first for the quantitative analysis, and the second for the qualitative analysis.

6.2.1 Results of Quantitative Analysis of Student Perceptions

The ranking scale components in the fourth questionnaire sought students' attitudes towards their writing experience and their rankings of preferences of the three writing conditions.

6.2.1.1 Students' attitudes towards writing

Ten sets of questions asking students to rank their writing experience were raised. These sets of attitude statements represented the participants' attitudes towards the individual writing, co-writing, and peer review conditions. The coding of the response categories for each item was: 1 – strongly disagree, 2 – disagree, 3 – somewhat disagree, 4 – somewhat agree, 5 – agree, and 6 – strongly agree.

The first four sets of questions probed the participants' attitudes towards writing processes in the three writing conditions, including the whole writing process, the planning stage, the writing stage, and the revision stage. A Kolmogorov-Smirnov test was first conducted to examine whether the data were normally distributed. This analysis showed that at least one of the *p* values in each group of comparable attitude statements was less than .05, suggesting the data distributions of all groups were significantly non-normal (see Table 6.1). Thus, a series of repeated samples non-parametric tests, Kendall's *W*, were used for data analysis. Following the main Kendall's *W*, non-parametric *post hoc* tests were conducted by performing Wilcoxon signed-rank tests where appropriate, i.e., when the *Chi-square* score was statistically significant. When a Wilcoxon signed-rank

test was conducted, a Bonferroni adjustment on the results of the Wilcoxon test was applied because Wilcoxon tests make multiple comparisons, which make it more likely to declare a result significant when it is not (a Type I error). Thus, a Bonferroni adjustment was used when reporting the results with a new significance level of 0.05/3 = 0.017. That is to say, the result is only statistically significant when the *p* value is less than 0.017 rather than .05.

Table 6.1 Normality of student attitude statements of writing processes

Attitude Statements	Normality
1.1 I liked the writing process very much when I wrote individually.	$D(18) = .269, p < .01^*$
1.2 I liked the writing process very much when I wrote collaboratively.	$D(18) = .238. p < .01^*$
1.3 I liked the writing process very much when I peer reviewed.	$D(18) = .203, p < .05^*$
2.1 I liked planning my essay very much when I wrote individually.	$D(18) = .171, p > .05$
2.2 I liked planning my essay very much when I wrote collaboratively.	$D(18) = .339, p < .01^*$
2.3 I liked planning my essay very much when I peer reviewed.	$D(18) = .345, p < .01^*$
3.1 I liked writing my essay very much when I wrote individually.	$D(18) = .171, p > .05$
3.2 I liked writing my essay very much when I wrote collaboratively.	$D(18) = .333, p < .01^*$
3.3 I liked writing my essay very much when I peer reviewed.	$D(18) = .222, p < .05^*$
4.1 I liked revising my essay very much when I wrote individually.	$D(18) = .150, p > .05$
4.2 I liked revising my essay very much when I wrote collaboratively.	$D(18) = .351, p < .01^*$
4.3 I liked revising my essay very much when I peer reviewed.	$D(18) = .323, p < .01^*$

The findings of the Kendall's *W* analyses are summarized Table 6.2. Results with respect to the overall writing process (statement set 1) revealed that more students preferred co-writing (2.11) over peer review (2.06) and peer review over individual writing (1.83). However, the differences were not significant ($\chi^2(2) = 1.06, p > .05$). These results suggest that students liked the writing process in all three conditions. When the three stages of the writing process (i.e., planning, writing, and revision) were

analyzed, although there was a tendency that students liked co-writing and peer review more than individual writing, no statistically significant differences were found in the planning or the writing stages. The results indicate that students had no preference among the three writing conditions in terms of planning and writing.

The differences in preferences of the revision stage for the three writing conditions were statistically significant ($\chi^2(2) = 17.64$, $p < .01$). Wilcoxon tests were used to follow up this finding. A Bonferroni correction was applied, so all effects are reported at a 0.0167 level of significance. Based on the latter analysis, there was a statistically significant difference in revising essays in co-writing versus individual writing (T = 13.5, $z = -2.46$, $r = -0.41$), and a statistically significant difference in peer review versus individual writing (T = 12, $z = -2.14$, $r = -0.36$). However, there was no statistically significant difference in students' preference for co-writing versus peer review (T = 0, $z = -1.84$, $r = -0.31$). These results suggest that students preferred revising their essays in the co-writing and peer review conditions over the individual writing condition, but there was no difference between the two collaborative writing conditions.

Table 6.2 Non-parametric related samples test: Student preference of writing processes in individual writing, co-writing, and peer review

Attitude Statements	Mean	s.d.	Mean rank	*Kendall's W*	*Chi-Square*	*p*
1.1 I liked the writing process very much when I wrote individually.	4.72	1.07	1.83			
1.2 I liked the writing process very much when I wrote collaboratively.	4.83	1.43	2.11	0.03	1.06	> .05
1.3 I liked the writing process very much when I peer reviewed.	4.67	1.50	2.06			
2.1 I liked planning my essay very much when I wrote individually.	4.67	1.14	1.89			
2.2 I liked planning my essay very much when I wrote collaboratively.	4.78	1.44	2.17	0.03	1.12	> .05
2.3 I liked planning my essay very much when I peer reviewed.	4.61	1.24	1.94			
3.1 I liked writing my essay very much when I wrote individually.	4.67	1.14	1.92			
3.2 I liked writing my essay very much when I wrote collaboratively.	4.61	1.38	2.03	0.01	0.28	> .05
3.3 I liked writing my essay very much when I peer reviewed.	4.61	1.38	2.06			
4.1 I liked revising my essay very much when I wrote individually.	3.89	1.57	1.39			
4.2 I liked revising my essay very much when I wrote collaboratively.	5.28	1.18	2.44	0.49	17.64	< .01*
4.3 I liked revising my essay very much when I peer reviewed.	4.83	1.47	2.17			

The last six sets of questions queried participants' attitudes towards different aspects of their writing products in the three conditions, and were collapsed into a set of summary scales called "writing product scales". The data were first examined for the normal distribution. This analysis showed that the data distributions of all groups were significantly non-normal with at least one of the *p* values less than .05 in each group of comparable attitude statements (see Table 6.3). Thus, repeated samples non-parametric tests, Kendall's *W*, were used for data analysis, followed by non-parametric *post hoc* Wilcoxon signed-rank tests where appropriate.

Table 6.3 Normality of student attitude statements of writing products

Attitude Statements	Normality
5.1 I wrote more when I wrote individually.	$D(18) = .236, p < .01^*$
5.2 I wrote more when I wrote collaboratively.	$D(18) = .159, p > .05$
5.3 I wrote more when I peer reviewed.	$D(18) = .200, p > .05$
6.1 I wrote with a greater accuracy when I wrote individually.	$D(18) = .210, p < .05$
6.2 I wrote with a greater accuracy when I wrote collaboratively.	$D(18) = .289, p < .01^*$
6.3 I wrote with a greater accuracy when I peer reviewed.	$D(18) = .256, p < .01^*$
7.1 I wrote more complex sentences when I wrote individually.	$D(18) = .186, p > .05$
7.2 I wrote more complex sentences when I wrote collaboratively.	$D(18) = .234, p < .05$
7.3 I wrote more complex sentences when I peer reviewed.	$D(18) = .273, p < .01^*$
8.1 I liked the content of my writing very much when I wrote individually.	$D(18) = .234, p < .05^*$
8.2 I liked the content of my writing very much when I wrote collaboratively.	$D(18) = .196, p > .05$
8.3 I liked the content of my writing very much when I peer reviewed.	$D(18) = .273, p < .01^*$
9.1 I wrote a well-organized and cohesive essay when I wrote individually.	$D(18) = .208, p < .05^*$
9.2 I wrote a well-organized and cohesive essay when I wrote collaboratively.	$D(18) = .321, p < .01^*$
9.3 I wrote a well-organized and cohesive essay when I peer reviewed.	$D(18) = .283, p < .01^*$
10.1 I used a wide range of vocabulary when I wrote individually.	$D(18) = .183, p > .05$
10.2 I used a wide range of vocabulary when I wrote collaboratively.	$D(18) = .278, p < .01^*$
10.3 I used a wide range of vocabulary when I peer reviewed.	$D(18) = .220, p < .05^*$
*Writing product – Individual writing scale[14]	$D(18) = .159, p > .05$
*Writing product – Co-writing scale	$D(18) = .158, p > .05$
*Writing product – Peer review scale	$D(18) = .212, p < .05^*$

Results of Kendall's *W* are presented in Table 6.4. In terms of students' attitudes towards writing products, they appeared to like their writing products in the co-writing condition the most (2.14), in the peer review condition the second-most (2.03), and in the individual writing condition the least (1.83), but the difference was not statistically significant, ($\chi^2(2) = 0.94, p > .05$). These results suggest that students had no preference

[14] *Writing product – Individual writing scale = Compilation of attitude statements 5.1, 6.1, 7.1, 8.1, 9.1, and 10.1. This scale represents the extent of the participants' attitudes toward the writing product in the individual writing condition.
*Writing product – Co-writing scale = Compilation of attitude statements 5.2, 6.2, 7.2, 8.2, 9.2, and 10.2. This scale represents the extent of the participants' attitudes toward the writing product in the co-writing condition.
*Writing process – Peer review scale = Compilation of attitude statements 5.3, 6.3, 7.3, 8.3, 9.3, and 10.3. This scale represents the extent of the participants' attitudes toward the writing product in the peer review condition.

of their writing products in the three writing conditions. In terms of the specific aspects of writing products, the analysis of the fifth set of attitudinal statements revealed that students believed that they wrote the most in the individual writing condition (2.11), second-most in the peer review condition (2.00), and least in the co-writing condition (1.89). However, a Kendall's *W* test revealed no statistically significant difference among the three conditions for these ratings ($\chi^2(2) = 0.56, p > .05$). Similarly, Kendall's *W* revealed no significant differences among the three conditions in statements seven to ten either ($p > .05$), although a tendency was found that students liked their writing content more and believed that they wrote more complex sentences, wrote better organized and more cohesive writing, and used a wider range of vocabulary in the co-writing and peer review conditions than in the individual writing condition.

Students' preferences in regards to the accuracy of their essays (statement set 6) were found to be significantly different among the three writing conditions ($\chi^2(2) = 8.94, p < .02$). Follow-up Wilcoxon tests showed a statistically significant difference in co-writing versus peer review ($T = 0, z = -2.24, r = -0.37$), indicating that students believed that their writings were significantly more accurate in co-writing than in peer review. The preference for co-writing over individual writing did approach statistical significance ($T = 27.5, z = -1.87, r = -0.31$), with more participants favouring co-writing (2.39) over individual writing (1.56). No significant difference was found in participants' preferences on peer review and individual writing ($T = 31.5, z = -1.64, r = -0.27$), although there was a trend for more participants to prefer peer review (2.06) over individual writing (1.56). These findings suggest that students believed that their writings were more accurate in the co-writing condition than in the peer review and individual writing conditions.

Table 6.4 Non-parametric related samples test: Student preference of writing products in individual writing, co-writing, and peer review

Attitude Statements	Mean	s.d.	Mean rank	*Kendall's W*	*Chi-Square*	*p*
5.1 I wrote more when I wrote individually.	4.72	1.60	2.11			
5.2 I wrote more when I wrote collaboratively.	4.11	1.57	1.89	0.02	0.56	> .05
5.3 I wrote more when I peer reviewed.	4.50	1.47	2.00			
6.1 I wrote with a greater accuracy when I wrote individually.	4.06	1.31	1.56			
6.2 I wrote with a greater accuracy when I wrote collaboratively.	5.17	1.34	2.39	0.25	8.94	= .01*
6.3 I wrote with a greater accuracy when I peer reviewed.	4.89	1.32	2.06			
7.1 I wrote more complex sentences when I wrote individually.	4.17	1.72	1.81			
7.2 I wrote more complex sentences when I wrote collaboratively.	4.78	1.52	2.11	0.04	1.40	> .05
7.3 I wrote more complex sentences when I peer reviewed.	4.83	1.30	2.08			
8.1 I liked the content of my writing very much when I wrote individually.	4.61	1.24	1.92			
8.2 I liked the content of my writing very much when I wrote collaboratively.	4.44	1.54	2.03	0.01	0.29	> .05
8.3 I liked the content of my writing very much when I peer reviewed.	4.67	1.24	2.06			
9.1 I wrote a well-organized and cohesive essay when I wrote individually.	4.28	1.32	1.89			
9.2 I wrote a well-organized and cohesive essay when I wrote collaboratively.	4.67	1.33	2.17	0.04	1.27	> .05
9.3 I wrote a well-organized and cohesive essay when I peer reviewed.	4.44	1.25	1.94			
10.1 I used a wide range of vocabulary when I wrote individually.	4.39	1.20	1.69			
10.2 I used a wide range of vocabulary when I wrote collaboratively.	5.00	1.24	2.25	0.16	5.57	> .05
10.3 I used a wide range of vocabulary when I peer reviewed.	4.83	1.25	2.06			
*Writing product – Individual writing scale	23.22	6.81	1.83			
*Writing product – Co-writing scale	28.17	7.22	2.14	0.03	0.94	> .05
*Writing product – Peer review scale	28.17	6.49	2.03			

Lastly, all the 10 sets of questions (n=30) were grouped into another set of summary scales, referred to as "overall scales" to examine the overall extent of the students' attitudes towards the three writing conditions. The findings are presented in Table 6.5. Results of the analysis showed that there was no significant difference in students' attitudes towards the three writing conditions with regard to the overall writing experience ($\chi^2(2) = 4.39$, $p > .05$), although they appeared to equally enjoy the overall writing experience in the co-writing and peer review conditions (2.19) more than the individual writing condition (1.61).

Table 6.5 Non-parametric related samples test: Student preference of overall writing experience in individual writing, co-writing, and peer review

Attitude Statements	Mean	s.d.	Mean rank	*Kendall's W*	*Chi-Square*	*p*
Overall individual writing scale	44.17	9.65	1.61			
Overall co-writing scale	47.67	11.58	2.19	0.12	4.39	> .05
Overall peer review scale	46.89	10.52	2.19			

In summary, analyses of all 10 attitudinal statement sets, as well as the summary sets, showed a tendency for students to prefer the two collaborative writing conditions over the individual writing condition, except with respect to one of the 10 statement sets regarding fluency of writing, in which case the students believed they wrote the most in individual writing and the least in co-writing. However, the results of non-parametric related samples tests Kendall's *W* revealed that most of the differences observed were not statistically significant, except for the differences found in two statement sets. With regard to students' preferences in the revising stage of writing, the results showed that students strongly favoured co-writing and peer review over individual writing, but there was not much difference between co-writing and peer review. With regard to students' preference in terms of accuracy of writing, it was found that they strongly favoured co-writing over peer review and individual writing, and believed that their co-constructed writings were significantly more accurate than their individually developed writings, even when they received feedback in the peer review condition.

6.2.1.2 Students' comparisons of the writing conditions

In the fourth questionnaire, students were asked whether they had a preference among the three writing conditions; and if they did, they were asked to rank the three conditions and provide justifications for their choices. The highest rank was assigned 3, the second-highest 2, and the lowest rank 1.

Among the 18 participants, 11 students (61.1%) stated a preference, and seven students (38.9%) expressed no preference. The justifications for their choices are presented in section 6.2 below in the analysis of the qualitative data. A non-parametric related samples test (Kendall's *W*) was used to analyze the ranks of the three writing conditions by the 11 students who stated a preference.

Results revealed that co-writing received the highest rank among the three conditions ($M = 2.36$), peer review the second-highest ($M = 2.00$), and individual writing the lowest ($M = 1.64$). However, Kendall's *W* found no significant difference in the ranking of the three conditions ($\chi^2(2) = 2.91$, $p > .05$).

These results confirmed the findings from the analysis of the students' attitude statement sets, as described earlier. Students had a tendency to favour co-writing over peer review; and, in turn, peer review over individual writing, but at the same time, they held complex attitudes toward the three writing conditions. Some had preferences, while others did not. Even within the group of students who expressed preferences, their preferences varied. Some favoured co-writing, some peer review, and some individual writing. Similar numbers of students held different preferences, so it is not surprising that no significant differences in ratings were found in the comparisons.

6.2.2 Results of Qualitative Analysis of Student Perceptions

All four questionnaires had open-ended questions, with a view to obtaining a more nuanced understanding of how students perceived the three writing conditions. These open-ended questions were analyzed qualitatively. Two common statements were consistently found in all questionnaires: that the three writing activities provided them with more opportunities (1) to practice the target language and (2) to recall the language forms they had learned in class. In addition to these commonly expressed views, students also mentioned unique strengths and issues associated with each writing condition. The latter findings are presented in this section for each writing condition in turn.

6.2.2.1 Student perceptions of individual writing

The questionnaires asked students what they liked or disliked about individual writing, and what advantages or problems individual writing posed. The questionnaires also included a neutral question, asking them to describe their experience when writing alone.

6.2.2.1.1 What students liked about individual writing

Students' positive comments fell into six main categories. Five categories related to the advantages of individual writing, including: (a) freedom or independence in writing; (b) opportunities for self-evaluation; (c) opportunities for pushed output; (d) feelings of

achievement; and (e) development of a reviewer's perspective. Another category captured students' comments that no problems were found in the writing process. Table 6.6 summarizes the positive comments provided by participants, along with the number of occurrences of such comments.

Table 6.6 What students liked about individual writing

	Comments	Number of Comments
1	Enjoying the freedom, or independence, in writing	13
2	Having the opportunity to see their own strengths and weaknesses	7
3	Having the opportunity to be pushed to use the target language	4
4	Building up the feeling of achievement	2
5	Developing a reviewer's perspective	1
6	Not seeing any problems	1
Total		28

Among the 18 students, 13 mentioned that they enjoyed more freedom in writing when they wrote individually. They could focus on their own ideas and thoughts and write at their own pace. They did not need to worry about what their partner might say, and their own thinking would not be interfered with; thus, they could concentrate on their own thoughts. Their ideas and their writings flowed more smoothly. For example, students mentioned in their questionnaires:[15]

> [Elena] (It was) easier to do individually. … (I) could just write what I wanted, did not have to agree with anybody else's ideas. (I) could go at my own pace.

[15] Some students' written comments were not grammatical because they were not native speakers of English. However, no corrections or clarifications have been made in the presentation of students' comments, unless the comments seemed likely to confuse the writer.

[Mark] Writing alone gave me the ability to produce something original for myself. … If this was done by a group, I would not have been able to produce all my ideas onto the paper.

[Tim] Working alone to write this paper was good because I was able to use my own ideas and only my own ideas to interpret the pictures. Sometimes when working in a group it's hard to express everything one might want to.

[Cathy] … I was able to think more clearly when I was by myself. … I could write about only what I thought, rather than trying to collaborate with someone else's ideas. … I felt more productive alone than with someone else.

The second strength of individual writing—having the opportunity to see one's own strengths and weaknesses—was reported by seven participants. The students claimed that individual writing gave them the chance to evaluate their own progress in Chinese learning, including their own strengths and weaknesses in Chinese writing. Writing alone made them realize that they would have to put more effort into learning Chinese in the future. Some students wrote:

[Yuko] I liked I could use all my ability about Chinese to write, so I could know what my real ability is. It was good to know and to test what I could do for writing.

[Rena] I was forced to realize how much I need to study. I didn't realize how much I relied on the text to write my Chinese paragraphs.

[Helen] In working alone I was provided a solitary and quiet working environment, and I was able to reflect upon my own Chinese abilities. … I was better to gauge my personal ability in respects to writing in Chinese. This particular activity, i.e., in working alone reaffirmed the fact that I need to review my characters and sentence structures to enhance my writing abilities.

[Kyoko] I can test my Chinese without help and I think it will improve my Chinese a lot.

Four students mentioned that they were sometimes forced to generate sentences in the target language to convey their thoughts, and that they enjoyed this experience, despite finding it challenging. The experience of being pushed to draw on existing linguistic knowledge to come up with words or sentences is seen as facilitating students' SLA. Being pushed encourages students to better develop their partially developed linguistic knowledge and may cause them to pay more attention to relevant input in their future exposure to the target language (Swain, 1985, 1991). The four students who cited this as a benefit of individual writing made the following comments in their questionnaires:

[Tina] It allowed me to use all the Chinese I have learned thus far since I couldn't bring notes or anything like that. At times, I wanted to write something I did not know how to form in a sentence, so I had to think of some other way to express it, or I just deleted the idea altogether.

[Sue] Instead of asking our partners about certain vocabulary words, we had to think about it ourselves.

[Rena] I had to really think about my writing, which isn't a bad thing but still quite challenging.

[Yuko] I just think by myself and just try to come up with words, but it was limited.

Another strength of individual writing expressed by two students is that the experience made them feel happy about what they had achieved so far in their Chinese language learning. Having positive affective attitudes toward their language learning may increase students' motivation to learn. These two students' comments are as follows:

[Rak] I like how I can effectively use Chinese to describe the pictures and what I want to say. I am kind of proud of my Chinese language skills.

[Tina] I realized that I am usually able to figure out how to say certain things on my own without asking. Working alone and with the enough time given, I could come up with a good story.

Only one student mentioned the last strength—developing a reviewer's perspective—and she found it satisfying to spot her own mistakes in editing her own paper. This skill may help students to become more critical in writing and editing their future papers.

[Sara] It was good to write and edit my own paper, so I can see what are the common mistakes that I made throughout the paper.

Finally, one student commented that she did not experience any problems in the individual writing condition.

6.2.2.1.2 What students disliked about individual writing

Other than one advanced student who mentioned that she had no problem in writing individually, the remaining 17 students commented on various problems in individual writing. The limitations of individual writing were reflected in four major areas, as summarized in Table 6.7: (a) lack of peer help; (b) difficulty encountered in writing; (c) unavailability of course materials; and (d) a boring writing process.

Table 6.7 What students disliked about individual writing

	Comments	Number of Comments
1	Unable to seek help from peers	13
2	Encountering difficulty in the process of writing	8
3	Unable to seek help from other sources, such as textbooks	4
4	Feeling the writing process was very boring and frustrating	3
Total		28

The majority of participants, 13 of 18, complained about having no peer to turn to for help when they wrote individually. The lack of peer help reduced the details in, and thereby, the quality of their writings. They could not consult their peers about pinyin, characters they forgot, and/or sentence structures they were uncertain about. Thus, some students claimed that they were not very confident in writing and revising. One student

who had noted that individual writing allowed him to write at his own pace clarified that he worked faster because he did not know what was right and what was wrong. Meanwhile, a different student mentioned that it took more time to write when working alone than when working with a partner. Some students even said explicitly that they did not like individual writing because they learned nothing. These negative attitudes toward individual writing are illustrated below:

[Rena] I couldn't ask questions, so I feel my work had to be kept more simplistic.

[Keiko] This was the third time for me, so I think it's getting better, faster to think and to type, but I think the writing would have more details if I work on it with Daeng. … I cannot see my weak points.

[Tim] One big problem I had working alone is that I had no one to ask for help or to remind me about certain characters that I had forgotten.

[Mika] (The problem I had in working alone was) not being able to ask questions to the other person in order to make sure my sentences were correct. … Sometimes I felt not very confident. If I could ask somebody else, and if the person agrees with me for what I write, I would have felt more confident.

[Yuko] I did not like working by myself because (there was) no one to help my Chinese to fix or give me more idea to learn.

The second-most frequently reported problem in individual writing is that students found it very difficult to write in Chinese. The same problem was also reported by two

students in the co-writing condition (none in the peer editing condition), but many more students (n = 8) reported that they encountered difficulty in individual writing. The students found individual writing difficult because they could not come up with the right pinyin to get the list of character prompts, could not recognize the right characters, could not formulate sentences following the right grammatical rules, and could not catch and correct errors. The student comments reported below illustrate such attitudes:

[Aki] Some part I got stuck such as I did not have idea of pinyin.

[Rena] I could sometimes remember the word, but couldn't tell what the spelling of the character was. I wasn't sure what some of my grammar should look like. It was hard to translate my thoughts to Chinese.

[Helen] I found it hugely difficult to come up with the words I was looking for to describe each illustration; as well, I experienced difficulties when trying to formulate my sentence in accordance to grammatical rules of this language. Writing, I find, in Mandarin is very difficult.

[Rick] (It was) just that I couldn't recognize some characters.

[Sara] The problem I has was it was very hard to catch some of the problems I made and harder to figure out whether I corrected it right with the correct grammar.

In addition to the lack of peer help, four students also mentioned that the lack of reference books and/or textbooks deprived them of the chance to write Chinese using the correct vocabulary and expressions. These four students wrote:

[Tim] I did not like the fact that I had no access to any outside materials to aid me in producing the paper. Some of the characters are really hard to remember and not having any books made it sort of difficult to produce the paper.

[Rena] I had no reference, so it was difficult to remember some of my vocabulary. It was a little intimidating because I usually have a reference to use.

[Rak] Sometimes I forgot the vocabs, so this is the problem of writing alone. I'd rather having my textbooks with me when I am writing.

[Mika] (What I did not like about writing alone was) not being able to use textbooks, etc. I wanted to make sure some of the expressions were right by using books.

Finally, as illustrated in the quotes below, two students commented that they found individual writing boring, and one student mentioned that she found the activity very frustrating.

[Sara] It [working alone] was okay, but a little bit boring because there was no one to talk to. It was also a bit harder.

[Yuko] It was boring for me to create ideas and write by myself.

[Rena] I find it frustrating writing on my own … Writing alone was frustrating because I don't have the skills developed to be able to express my thoughts. Also, I often doubt my spelling and grammar, which makes it hard to write.

6.2.2.1.3 Summary

All 18 participants reported that individual writing had its own advantages in helping them to develop into better language learners. Individual writing provided them with an opportunity to become more aware of their own strengths and weaknesses in Chinese language learning and writing, and an opportunity to be pushed to practice the target language. They also recognized the freedom of individual writing: they could write what they wanted to express and work at their own pace. Some students also felt proud of how much and how well they could write using the target language. In total, 28 positive comments were provided by the participants.

Except for one student, 17 students mentioned that they encountered various problems and difficulties when writing individually. When there was no external help available from either peers or other references such as textbooks, they found that they had to keep their writing more simplistic because they could not type the pinyin correctly, identify the right characters, or come up with good ideas to describe the pictures. Some students were not confident in what they produced. About half of the students also mentioned that they found it very difficult to write individually. Three students did not like individual writing at all, describing it as boring and frustrating. In total, students made 28 negative comments about individual writing.

6.2.2.2 Student perceptions of peer review

A similar questionnaire was administered immediately following the peer review task to seek student perceptions of this collaborative writing technique. Like the questionnaire for individual writing, this questionnaire asked students what they liked and disliked about peer review, and what advantages and problems peer review posed; the questionnaire also included two neutral questions asking them to describe their experience when they edited their peer's paper and when their papers were edited. In addition, students were also asked whether they had any previous experience with peer review. Their reflections on their writing processes in the peer review condition are reported in the following section, including both the pros and the cons of this writing condition.

6.2.2.2.1 What students liked about peer review

The advantages of peer review reported by students covered a wider range than that reported for individual writing. Students mentioned nine advantages of the peer review condition (see Table 6.8), compared to five for individual writing. As with in individual writing, some students noted that they found no problems in the peer review writing condition. Three advantages were found in both conditions: developing a reviewer's perspective, enjoying more freedom in writing, and seeing their own strengths and weaknesses. All positive comments are discussed in sequence below.

Table 6.8 What students liked about peer review

	Comments	Number of Comments
1	Developing a reviewer's perspective	10
2	Enjoying the freedom, or independence, in writing	4
3	Seeing their own strengths and weaknesses	3
4	Seeing the strengths and weaknesses of peers	3
5	Receiving constructive and valuable comments from peers	10
6	Being exposed to different ideas and language forms	10
7	Enjoying the oral interaction session	5
8	Providing mutual support	4
9	Feeling less pressure than working together from the beginning	1
10	Not seeing any problems	4
Total		54

In contrast to the questionnaire for the individual writing condition, in which only one student mentioned that the opportunity to edit her own paper allowed her to see common errors in her writing, in the peer review condition, 10 students commented that they could spot errors more easily, that they learned from the way their peers revised, and that correcting errors helped them learn the target language. The process of peer reviewing forced the students to become critical when they read their own and their peers' papers. Some sample student comments follow:

[Tina] (I liked) working with a partner to edit because when reading over my own writing, it's harder to find mistakes. We could catch mistakes that we would otherwise not find ourselves.

[Yuko] Sometimes, it is hard to find mistakes by myself, but with a partner it was great. He found my mistakes very smoothly and pointed (them) out clearly. It was very helpful for me. I could find mistakes more easily

when I looked at another's paper. Also, my partner could correct my Chinese very fast.

[Rena] It (peer review) gave me a chance to practice and be corrected right away. Also, that I could try and see the changes to be made to someone else's. It was good to learn to see mistakes and how to correct them.

[Aki] We can see other's perspective of revising.

[Rak] I like we can correct each other and learn from the mistakes that we have made. This is another way to improve Chinese language skills.

Only four students commented on enjoying the freedom and independence of writing in the peer review condition; 13 students made this same comment in the individual writing condition. The four comments echo those provided for individual writing:

[Rak] I liked how the ideas in my head can be written freely independently of my partner's ideas. I also wrote my stuff without having to discuss first with my partner, so it was quicker.

[Rick] I was able to write my own opinion and idea.

[Cathy] Writing alone (at the beginning) was good to get my own thoughts down, … I liked writing essay alone, with my own thoughts, but having someone else review my writing.

[Aki] Working alone (at the beginning) can save my time to discuss with (my) partner, unlike working together.

Another positive comment found in both peer review and individual writing conditions is that students could see their own strengths and weaknesses in writing and in language learning. Three students (as opposed to seven in the individual writing) spoke to this advantage in the questionnaires:

> [Keiko] I could see what's wrong with my grammar. (I had) so many grammar errors and difficulty in pinyin, but not in characters. I need to study more writing, like translation or short essays like today. … After I write, Daeng fix my writing for me so that I can see my weak points.
>
> [Rena] As always, it (peer review) pointed out some skills I lack.
>
> [Daeng] It (peer review) helps me realize how much I can remember from the course.

In addition to seeing their own strengths and weaknesses, the students also stated that peer review helped them see the strengths and weaknesses of their peers. Three students included such comments in their questionnaires:

> [Elena] (I corrected his) grammar mistakes. His sentence structures were messy. He could not always convey what he wants to say. He accepted all of my suggestions. … It seemed helpful for my partner to have sentences corrected.
>
> [Mark] While editing a peer's paper, I saw the mistakes of another peer's and was able to give useful and helpful advice.
>
> [Keiko] He is good at grammar but not in characters.

A fourth advantage of peer review, one of the three most frequently mentioned advantages (n=10), is that students valued their peers' feedback and felt that their writing improved because their peers helped them with grammar, vocabulary and even ideas. Some examples are given below:

[Cathy] I enjoyed having someone else read and edit my paper. Having someone else's input with grammar and spelling is very helpful. … I like having someone else edit my work.

[Helen] I enjoyed the fact that partner was able to revise my written piece, as I made numerous grammatical errors throughout my piece and I had troubles remembering specific words. My partner was very helpful in my editing/revising process. He corrected many of my mistakes and helped me form more complete and complex sentences. My partner is far more advanced in the language than myself. Therefore, he was very helpful in editing my paper.

[Kyoko] I can have an opportunity to practice my writing and also I can improve my writing skills by getting my friend's suggestions or advice.

[Rena] It was good to … learn how to properly say the things I want. I didn't feel embarrassed. I was glad that I could get help.

[Tim] I really enjoy having my own Chinese writing peer edited. It gives me some valuable insights and helps to narrow the field of areas I need more work on.

Another of the most frequently mentioned (n=10) advantages of peer review is that it exposed them to various new and better ways to express ideas. They saw peer review as a learning process because they learned new structures and creative ideas from their peers, and believed that such exposure would eventually improve their writing skills. Some students wrote:

[Mika] It was nice to see what she wrote and her ideas, etc. I learned another way of writing by looking at hers. The good things about editing each other's paper are learning other ways of writing, expressions, and different kinds of words, different ideas.

[Helen] More so, in reading my partner's paper, this process served as a learning experiences as I was able to see my partner's writing styles and superior abilities; however, I was not much help in the editing and revising process.

[Aki] I could see how other's using new words or grammar that I could not even come up with in my head. (Editing my peer's paper) helps (me) to improve and reminds me to use the new grammar or words. Revising others could see how they write their sentences and made my essay better.

[Tina] I saw there was sometimes a better way to write something, as opposed to the way I wrote it.

Five students also mentioned that an oral interaction session with peers played an important role in their learning because the discussion with their peers helped them

clarify why and where they had made mistakes and that this clarification helped them better retain the knowledge for future use. Some students wrote:

[Kyoko] I can discuss things that I also have misunderstanding or problems (in) in order to improve my writing. Moreover, by discussing I can remember well; therefore, I won't make the same mistakes again.

[Rena] It was good to know how to make it better right away…

[Sara] Similar to when I edited my partner's paper, it was very constructive to talk about problems and figuring out a solution to it.

[Yuko] We edited together and could talk about mistakes after individual writing. … It was a good time to review together and know clearly where are wrong.

Another noted advantage of peer review is that it provided an opportunity for scaffolding. Four students mentioned that they liked peer review because students could help each other to find and correct errors and could contribute their own strengths to writing through collaboration. The following statements are examples of comments received on this theme:

[Daeng] I think working with partner is very beneficial, because we can help each other correct the mistakes. Each of us brings unique skills. … It was good. We helped each other editing the works, which was useful.

[Keiko] We can see each other's problems and fix (them) and help each other.

[Cathy] If there were grammar points we did not know, we could help each other through the grammar.

In addition, one student mentioned that she felt less pressure in peer review than in co-writing. This student (Mika) said “I liked working individually at first then revising it together. I think that way I felt less pressure than working together from the beginning”.

Finally, four students in peer review mentioned that they saw no problems with their peer review experience. By contrast, only one student made this comment about the individual writing condition.

6.2.2.2.2 What students disliked about peer review

Just as there were more advantage categories reported by students for peer review compared to individual writing, so, too, were more disadvantages noted. Seven sources of negative attitude were identified in the students’ comments (see Table 6.9).

Table 6.9 What students disliked about peer review

	Comments	Number of Comments
1	Encountering difficulty in the process of writing	2
2	Unable to seek help from other sources, such as textbooks	1
3	Suffering from a low language proficiency level	7
4	Unable to provide or receive feedback due to discrepancy in language proficiency levels with the peer	4
5	Feeling a bit nervous, embarrassed and self conscious in the writing process	4
6	Holding different opinions	3
7	Dislike being read	1
Total		22

Two types of negative comment about peer review were similar to those expressed about individual writing, though a smaller number of people reported these negative comments in the peer review condition. These comments concerned the difficulty encountered in the writing process (two comments for peer review, compared to eight for individual writing) and the unavailability of course materials (one comment, compared to four for individual writing). These three comments are featured below:

[Sung] A few vocabs that I don't know made me confuse(d). … Sometimes, once I learned new chapter I forget most vocab and grammar that I have learned, (so I don't like it).

[Rena] I find it hard to know which characters to use, or how to put the sentences I want to say in English into Chinese.

[Tim] I did not like not having my books with me while writing. Usually I use my textbooks as a reference in case of mistakes. Not having them made this assignment a little harder to do.

As previously mentioned, the most frequently mentioned disadvantage of individual writing is the lack of peer help. This type of comment did not arise in the peer review condition because of its collaborative nature. However, the collaborative nature of peer review led to some other problems. The most frequently mentioned disadvantage of peer review (n=7) is that students had a low language proficiency level, which limited their ability to validate their comments. The following comments illustrate this attitude:

[Tim] I was unsure of myself about some grammar points when I edited my partner's paper. … Since we are all beginners in Mandarin, we truly didn't

know if we were making the right corrections to each other's papers or using the right words in the same cases.

[Mika] When we both didn't know the correct way of expressing / writing a sentence or words, we ended up not knowing what to do with that sentence or words.

[Rak] My partner didn't really correct many of my mistakes because we both are not advanced Chinese speakers. … I wish I knew more Chinese so that I can correct my partner's mistakes more. … Not many mistakes were corrected.

[Cathy] I found it a bit difficult to edit someone else's work. Sometimes I do not know the correct grammar or correct characters, so it made it a bit harder to edit someone else's paper. … Sometimes both of us did not know certain words, so it was difficult to edit a few words.

In addition to feeling limited by their knowledge of the target language, four students mentioned that they were not able to provide or receive any constructive feedback to and from their peers because their partners were too superior or inferior to themselves in their language skills. All four students were from pairs in which they worked with partners at a very different proficiency level from their own. However, this type of situation does not suggest that the participants found peer review unhelpful. In fact, the less proficient students found peer review beneficial; and one of the advanced students, Elena, who found that her peer had not been able to edit her paper, explicitly commented that she found herself learning in providing feedback to her peer. Only one student, Rick, claimed

that peer review was not a good experience for him. The students' comments were as follows:

> [Helen] I offered little in the editing of my partner's paper due to the fact that I am working at a lower level of understanding and comprehension.
>
> [Rena] I felt that I was not able to "correct" anything, as my abilities are not as much as his. Mostly, I learned from his paper. … Just that my skills and understanding is less, so it really wasn't productive for me to mark his. I didn't change anything.
>
> [Elena] I did not receive very much feedback. … We read through it together. I changed a few words and left my paper relatively unchanged. … My problem in editing my partner's paper is trying to figure out what they were trying to say.
>
> [Rick] I was superior than my partner, so basically she couldn't edit much. … I could not confirm some characters with the partner. … My partner seems to struggle a lot. She couldn't write much. Basically her paper was barely written, so I couldn't edit much. … I don't know. Nothing good, really …

Although no students expressed finding peer review boring, four students held different negative feelings about peer review. Two students felt a bit nervous, one felt embarrassed to have her paper read, and one felt reluctant to edit his peer's paper. However, two of these students also indicated that their feelings did not bother them much. These students' comments are provided below:

[Sue] I was nervous because there were some pictures I could not explain well and I thought my story did not flow.

[Mika] I didn't dislike anything. Maybe I was a bit nervous at first when we edited mine, but it wasn't a big problem. (It) didn't bother me so much.

[Helen] Initially I felt highly embarrassed of the fact that my partner, someone who is far more advanced in the language than myself, was going to read my poorly drafted paragraph.

[Rak] I also think that we were afraid of editing each other's work because maybe we didn't want to show our mistakes. It's just another way of showing that you are good or something like that.

Another common problem of collaboration was noted in this peer review activity. Three students found that working together can lead to disagreement, especially when both partners persist in holding their own opinions. The comments below express this attitude:

[Tim] Unfortunately, my partner did not seem receptive towards receiving constructive criticism.

[Sue] My partner uses different sentence structures than me, and we had some disagreements regarding some scenes.

[Aki] The problem I had was idea difference.

One student reported a final problem in peer review. Elena mentioned that she did not like others to read her paper. She said “I don’t usually like to have people [peers] read what I write”.

6.2.2.2.3 Summary

All 18 students reported various strengths of peer review. The strengths mainly fall into 10 categories, three of which are the same as categories found in individual writing, i.e., developing a reviewer’s perspective, enjoying the freedom and independence in writing, and seeing one’s own strengths and weaknesses in language learning and writing. As previously noted, although these three categories were found both in individual writing and peer review activities, the numbers of student comments for each category varied greatly. For example, while only one student mentioned that the three-stage writing process in the individual writing condition helped develop a reviewer’s perspective, 10 students in the peer review condition made a similar comment. Students also commented on six other advantages of peer review. Peer review not only helped them see their own strengths and weaknesses, but also helped them become aware of the strengths and weaknesses of their peers. Two of the other most frequently mentioned positive comments, in addition to the development of a reviewer’s perspective, were the opportunity to receive rich feedback and the opportunity to be exposed to different and sometimes better ways to express their ideas. The participants also liked the oral interaction session, in which they provided feedback to each other, because they could clarify any misunderstandings and the discussion could help them remember the language

forms they had just learned. Four students also appreciated the opportunity to support each other and to contribute their own unique skills to the completion of the task. One student mentioned that she felt less stressed in the peer review condition than when working with a partner right from the beginning, i.e., in co-writing. In total, students provided 54 positive comments about peer review.

In terms of the drawbacks of peer review, while four participants mentioned that they did not see any problems with peer review, 14 addressed drawbacks that fell into seven categories. Two noted drawbacks were the same as found in individual writing; i.e., encountering difficulty in writing and preferring to have access to some course materials during the writing process. However, these comments were made by only three students. Six students mentioned that they felt their language proficiency level was too low to provide constructive feedback on their peer's writing, and four students mentioned that large discrepancies in language proficiency levels between peers made it difficult to provide or receive quality feedback. In addition, two students found that they encountered disagreements in discussion, a problem often found in collaborative work (Storch, 2003). Four students also mentioned they were nervous, embarrassed, or self-conscious, though two of them noted that these feelings were not large impediments. Finally, Elena, a student who expressed a strong preference for individual writing, claimed that she usually did not like her peers to read what she wrote. In total, students made 22 negative comments about peer review.

Thirteen participants had previous experiences of peer review. Most of them had these experiences in English courses, either at the university and/or in high school. Four participants had never been involved in peer review before. Two of these students were

Japanese, one was Korean student, and one was Canadian. Another student provided no information about previous experiences with peer review.

6.2.2.3 Student perceptions of co-writing

A third questionnaire was administered immediately following the co-writing task to seek student perceptions of this condition. Like the questionnaires on the individual writing and peer review conditions, this questionnaire asked students what they liked and disliked about co-writing, and about the advantages and problems associated with co-writing. Students were also asked to describe their experience of co-writing. Finally, students were also asked whether they had any previous experience with co-writing. The students' reflections on their writing processes in the co-writing condition are reported in the following section of this chapter.

6.2.2.3.1 What they liked about co-writing

Students commented on a relatively large number of advantages of co-writing, which spanned 10 categories. Six categories were the same as those found for individual writing and peer review, and four categories were unique to co-writing. The six commonly held categories include (a) the opportunity for self-evaluation; (b) help from peers; (c) mutual support; (d) more exposure to different ideas and language forms; (e) availability of peer interaction; and (f) no problems found. The four categories not addressed in the other two writing conditions are: (a) opportunity to combine ideas; (b) improved quality of writing;

(c) a faster pace; and (d) more engagement and confidence. All comments are summarized in Table 6.10 and are discussed in sequence below.

Table 6.10 What students liked about co-writing

	Comments	Number of Comments
1	Providing mutual support	10
2	Receiving constructive and valuable feedback from peers	6
3	Enjoying the oral interaction session	6
4	Being exposed to different ideas and language forms	3
5	Seeing strengths and weaknesses of their own writing	1
6	Combining ideas	8
7	Improving the quality of writing	5
8	Working faster	2
9	Feeling more interested and confident	7
10	Not seeing any problems	7
Total		55

Ten of 18 students mentioned that co-writing enabled them to support and help each other in the writing process, because both partners could bring their own strengths and skills in grammar, vocabulary, and even ideas, and thus overcome difficulties likely to be encountered when writing alone. The students claimed that the mutual support made the task easier to complete. Two students explicitly mentioned that two heads were better than one. Some of the student comments are illustrated below:

> [Daeng] This second activity allowed us to combine our expertise to complete the task. As a result, this made it easier for both of us. … It's wonderful. She's skilful in recognizing characters which made this task become less intense. I know words, but I didn't sometimes recognize

characters, but my partner knows characters well. She said it is similar to Japanese. … This task allowed us to combine our different skills. … Each of us can bring unique skills that we have and put together to work.

[Rena] We were able to work together to make the paper. He wrote and used his knowledge of characters while I expressed ideas, sometimes in English, sometimes in Chinese, to be written down. … Two heads are better than one!! It made it easier to make the paper together than by yourself.

[Elena] We could assist each other with characters and sentence structures.

[Sue] We helped each other with the vocabulary. … We both gave out inputs in order to create a better story. … It was easier writing a paper with someone else.

One-third of the students appreciated the co-writing opportunity because they learned a great deal from their peers. Their peers helped them not only with characters, pinyin, and sentence structures, but also in playing a tutor role when they were struggling to write the paper with their limited command of the target language. Some students wrote:

[Yuko] He helped me understand and learn more Chinese.

[Cathy] It was good because if there were words that I didn't know, my partner could help me.

[Rena] It was good to work with someone who knew more than me. I could watch how to put sentences together, and use his knowledge of

characters to help express what I can't on my own. … Sometimes what I suggested in Chinese didn't make sense, so my partner had to correct me.

[Helen] I enjoyed the fact that I was paired with a partner who had a better grasp on the language than myself. I learned a lot from this process. … I enjoyed this process. My working partner was very helpful. I enjoyed working with my partner. He was very knowledgeable about sentence structure and could remember the words I found myself struggling with. … When I was partnered with Rick in the collaborative writing activity, Rick was able to answer many of my questions and fill in many of the gaps.

Another one-third of the students admitted that they enjoyed interaction with their peers because, as in the peer review condition, the discussion offered them opportunities to clarify uncertain points and to explore other plausible ways to express their ideas. Some student comments are given below:

[Kyoko] I like that we can actually review what we learned in class by discussing and writing together with a partner.

[Mika] I liked being able to ask and make sure the sentences were correct.

[Rick] We were able to discuss with each other the pictures and clarify some characters and pinyin that we didn't really remember.

[Sara] … there was more brainstorming and discussion about all the possibilities about sentence structures we used.

A fourth advantage of co-writing, which was also mentioned in the peer review condition, is that students were exposed to different ideas and language forms when they interacted with their peers. This advantage was mentioned by only three students in the co-writing condition, by contrast with the peer review condition, in which 10 students made similar comments. These three students wrote:

> [Cathy] Being able to discuss each other's ideas and writing styles helped me to see other ways of writing sentences and helped me to learn and remember words I had forgotten or didn't know.
>
> [Sara] It was very helpful and a good learning experience because it was good to see and hear what my partner's ideas were, and wok together to combine the ideas.
>
> [Mika] (I liked) hearing the other person's opinions and ideas.

Another advantage common to all three writing conditions is that students could see their own strengths and weaknesses through the practice. However, unlike in the other two writing conditions, only one student mentioned this advantage in the co-writing condition. This student, Rena, made the same comment about all three conditions. With respect to the co-writing condition, she said, "It really showed me how much I don't know! I lack in a lot of areas of writing the Chinese language."

An advantage frequently mentioned in the co-writing condition but not mentioned in the other two conditions is that students liked co-writing because they could share and

combine ideas; and accordingly, the jointly produced paper contained more details. Eight students made such claims, some examples of which are provided below:

[Sara] The good things were we got to work together and brainstorm together, so there were a lot more ideas.

[Mark] Writing with a partner gave me the chance to produce a storyline with output from both of us. This enabled a mixture of existing ideas.

[Sung] It's good to write with a partner, not myself because we had more imagination.

[Rak] We come up with more ideas and are able to help each other more.

Five students believed that collaboration between peers helped them to produce better papers that were more accurate, better organized, and that contained a wider range of vocabulary and more details.

[Keiko] I think it was … better than the first paper. (There were) more details in the paper. … The good things I like are it was faster, there were better grammar, better characters, and more details. … It was well organized and few grammar and character mistakes.

[Mika] (I was) able to make sure the sentences were correct …

[Cathy] Collaborating with another student helps write better sentences.

[Aki] (The experience was a) good one! Although I would rather work alone, it's good to work with someone. … working with others could make essay better than other's revising.

Two students also mentioned that collaboration made writing faster. These two students said:

[Keiko] I think it was way faster … than the first paper.

[Aki] Helping each other made the process so much faster.

Concerning positive feelings associated with co-writing, seven students described the experience as interesting, fun, and enjoyable, and felt confident in what they wrote. In comparison to the other two writing conditions, it was obvious that many students enjoyed co-writing very much. Some students described what they felt about co-writing as follows:

[Yuri] Working together with a partner was enjoyable and I learned more. It was not boring, and helped me learn Chinese better than myself. It was fun work. … It was fun to study with a partner, and we can create new ideas and also could learn more.

[Kyoko] I felt it's better to write one paper together rather than writing each paper separately because it's more fun to talk and listen to other's ideas.

[Sue] This was a fun experience because I was able to interact with my partner to create an interesting story.

[Mika] I felt more confident than when I was working by myself.

More students noted an absence of problems in the co-writing condition than in the individual and peer review conditions. Seven students wrote that they had no problems

with the co-writing condition, compared to one and four in the individual writing and peer review conditions, respectively.

6.2.2.3.2 What students disliked about co-writing

A similar number of disadvantages was noted in the co-writing and the peer review conditions. These disadvantages fell into seven categories, six of which are the same as those found for the peer review conditions, suggesting that collaboration leads to similar issues in the writing process. However, the number of comments for the six commonly held categories varied between the two collaborative writing conditions, suggesting that the two types of collaboration had unique features. The seven categories of negative attitude are summarized in Table 6.11 and are discussed in sequence below.

Table 6.11 What students disliked about co-writing

	Comments	Number of Comments
1	Holding different opinions	5
2	Suffering from a low language proficiency level	4
3	Unable to provide or receive feedback due to discrepancy in language proficiency levels with the peer	3
4	Encountering difficulty in the process of writing	3
5	Unable to seek help from other sources, such as textbooks	2
6	Wasting time	3
7	Feeling a bit nervous, embarrassed and unhappy in the writing process	3
Total		23

The most frequently mentioned complaint about co-writing (n=5) was that participants did not like the moments when partners held different ideas or disagreed. Such situations made it hard to reach decisions as to whose idea or suggestion to accept. Some written comments are provided below:

[Aki] When we have different ideas, trying to put them into one sheet of paper would be very troublesome.

[Rick] Sometimes we disagreed with each other when we wrote the character. … When working collaboratively, there were lots of disagreement.

[Elena] (I had to) try to accommodate the other person's ideas. … We usually had different ideas about what to write. … Partners make deciding what to write harder.

[Sue] We had some different disagreements about some grammar structures; thus, I didn't like the process of deciding which sentence is better or correct.

Meanwhile, four students also mentioned that their limited knowledge of the target language restricted their ability to express themselves freely. This constraint is voiced in the following student comments:

[Sara] The only problem was there were some grammatical structures that we both weren't too clear about, so we decided not to use some of the ideas we had.

[Kyoko] We sometimes have something that we haven't covered in a class, so we can't express exactly what we wan to say.

[Tina] There were only problems when neither of us could figure out how to say something.

[Sung] Sometimes I couldn't figure it out how to explain the pictures.

As in the peer review condition, some students (n=3) mentioned that discrepancies in language proficiency levels between two partners were not favourable to providing or receiving constructive comments. These three students wrote:

[Rick] It was not that good. My partner kept on making the same mistake over and over again. She kept on using English punctuations and always typed 他 (he) instead of 她 (she). She always uses space after a comma or a period.

[Tim] My partner wasn't very strong in Mandarin, making it harder to work.

[Helen] I felt I was not as helpful as I could have been. Rick knew far more than myself.

Three other students commented that they found the writing process difficult, a comment also made in the other two writing conditions. The following were the three students' comments:

[Tina] I found it hard to remember certain vocabulary, but I usually just found some other way to say it.

[Rak] We forgot many of Chinese words that we wanted to use for the paper and that affected how we produced the plot of the story a little bit.

[Sue] We had problems with some grammar structures. It was a difficult decision deciding which sentence we should use.

Another common response found in all three conditions is that students preferred to have their textbooks or course materials available during the writing process. Two students in the co-writing condition made such comments:

[Rak] I also would prefer having the textbooks when we are writing because I tend to forge the vocab.

[Tim] I did not like not having my books with me to help with this assignment. Not having my books makes it really hard to remember certain characters. … The only problem I had was that I couldn't use my books for reference.

Interestingly, students in the co-writing condition held contradictory attitudes about the efficiency of co-writing. Two students mentioned that co-writing made their writing process faster, as described in section 7.2.3.1. On the other hand, three students stated that co-writing was slow and even a waste of time. It is worth mentioning that one student, Aki, made comments that are completely contradictory. On the one hand, he mentioned that co-writing was faster; on the other hand, he also said that he could have finished earlier if he had written the paper by himself. The following were the three student comments with regard to the inefficiency of co-writing:

[Aki] I would say if I do this alone, I could finish earlier than working with some other people.

[Cathy] Talking about what to say while writing sentences wasted some time. If I was by myself, I may have written some things faster.

[Elena] It was the slowest because I had to consult another person's ideas.

Finally, three students described feelings of nervousness, embarrassment, and unhappiness when collaborating with their partners. However, they did qualify such complaints by the use of words such as "a little" and "slightly" in front of the adjectives and suggested some positive aspects along with their negative comments. These comments are provided below:

[Mika] I was a little nervous because I was worried about what my partner would think of my writing, but being able to ask questions and make sure the expressions with the partner was good.

[Helen] I was slightly embarrassed of the fact my skills and comprehension of the language were far below that of his.

[Tim] The experience was solid except I don't really get along with my partner.

6.2.2.3.3 Summary

With regard to the strengths and advantages of co-writing, all 18 participants made a range of comments that fell into 10 categories. Five categories were the same comments as those reported for the peer review condition: providing mutual support, receiving constructive and valuable comments from peers, enjoying the oral interaction session,

being exposed to different ideas and language forms, and seeing strengths and weaknesses of their own writing. However, the numbers of student comments received within these categories differed greatly between the co-writing and peer review conditions. For example, the most frequently mentioned advantage of co-writing (n=10) is that it provided an opportunity for peers to support each other; only four students mentioned this advantage in the peer review condition. Another frequently mentioned advantage of co-writing, not mentioned in the other writing conditions, is that students could combine ideas in their joint paper, generating a paper with more details. Five students also believed that co-writing benefited their writings in terms of quality, because they were more accurate and better organized. Co-writing seemed the most popular writing activity among the three in this study. Many students (n=7) found it fun and interesting, and more than one-third of students (n=7) mentioned that they experienced no problems in this writing activity. Two students mentioned that they could write faster with the help of their partners. Altogether, 55 positive comments about co-writing were provided.

Eleven of 18 participants noted drawbacks in co-writing; these disadvantages spanned seven categories, six of which were the same as found in the other collaborative writing condition, i.e., peer review. These six categories were: holding different opinions, suffering from a low language proficiency level, being unable to provide or receive feedback due to discrepancies in language proficiency levels between partners, encountering difficulty in the process of writing, being unable to seek help from other sources (e.g., textbooks), and feeling a bit nervous, embarrassed, and/or unhappy in the writing process. The most frequently mentioned problem was that partners found it hard

to make decisions when their opinions differed. A final problem of co-writing that was not mentioned in the other writing conditions is that it can be inefficient or a waste of time, a problem noted by three students. However, comments on this issue were sometimes contradictory.

Unlike peer review, which most (13 of 18) students had previously experienced, co-writing is a comparatively rare teaching technique. Only six students mentioned having previous experience with co-writing, e.g., in English courses, a journalism course, and a computer science course. The majority of participants (12 of 18) claimed that they had never jointly written a paper prior to the Chinese course.

6.3 Summary

To investigate students' perceptions of the three writing activities, both quantitative and qualitative analyses were conducted. The results of the quantitative analysis showed that students tended to prefer co-writing to peer review, and peer review to individual writing, in relation to most aspects of writing, such as the overall writing process, the planning stage, the revising stage; accuracy of the writing products, complexity of sentences, organization of writing, and vocabulary use. However, these preferences were only found to be statistically significant in relation to the revision stage and writing accuracy. Regarding students' preferences during the revising stage, students strongly preferred co-writing and peer review over individual writing, but there was no significant difference between the two collaborative writing activities. Regarding writing accuracy, students held significantly stronger preference to co-writing as compared to peer review and

individual writing, but no significant difference in preference was found between peer review and individual writing.

Another observed trend is that students preferred peer review over co-writing and individual writing for the writing stage and in terms of the content of writing. Further, students preferred individual writing to peer review and to co-writing as far as fluency of writing is concerned. However, these differences failed to reach statistical significance. These results suggest that although students preferred the collaborative writing activities to individual writing, they also acknowledged that each writing activity had its own strengths in relation to different aspects of writing. These complex attitudes toward the three writing conditions were confirmed in the analysis of students' rankings of their preferences in the three conditions. The analysis showed that seven of the 18 students had no preference for any of the three conditions; and that among the 11 students who expressed a preference, differences were not significant, despite a tendency for co-writing to be most favoured, followed by peer review and individual writing.

The qualitative analysis of the 72 questionnaires also revealed the tendency for students to prefer co-writing and peer editing over individual writing, as seen in Table 6.12 below. Fifty-five comments were made about the advantages of co-writing, and 54 for peer review, compared to only 28 for individual writing. Seven students failed to see any problems in co-writing, an attitude also expressed by four students in relation to peer review. By comparison, only one student failed to note any problems with individual writing. The three most frequently mentioned positive statements in each condition are also summarized in Table 6.12. As shown, there is no overlap among the three most frequently mentioned advantages across the three writing conditions, although some

common statements were found in all three conditions, as mentioned earlier. The results suggest that students held competing attitudes about the three writing conditions; namely, each of the three writing conditions had its own advantages, and these advantages could not be replicated in the same concentration in the other writing conditions.

Table 6.12 Summary of what students liked about the three writing conditions

Comments	IN	PE	CO
Total number of positive attitude statements	28	54	55
Not seeing any problems	1	4	7
Enjoy the freedom, or independence, in writing	13		
Seeing their own strengths and weaknesses	7		
Being pushed to use the target language	4		
Developing a reviewer's perspective		10	
Receiving constructive and valuable comments		10	
Being exposed to different ideas and language forms		10	
Providing mutual support			10
Combining ideas			8
Having more interest and feeling confident			7

Table 6.13 below summarizes all negative statements made by students in the questionnaires.[16] The distribution of negative comments across the three writing conditions is opposite to the pattern found for positive statements: students made 28 negative comments about individual writing, 23 about co-writing, and 22 about peer review. This pattern shows that students encountered more problems in individual writing than in the other two collaborative writing conditions. The results also reveal that the most frequently reported drawbacks in individual writing differ from those reported for

the two collaborative writing conditions, in which students often reported similar problems. Students explicitly expressed that individual writing restricted them from seeking help from peers, a resource that was unavailable to them given the nature of the activity.

Table 6.13 Summary of what students disliked about three writing conditions

Comments	IN	PE	CO
Total number of negative attitude statements	28	22	23
Unable to seek help from peers	13*		
Encountering difficulty in the process of writing	8	2	3
Unable to seek help from other sources, i.e., textbooks	4	1	2
Suffering from a low language proficiency level		7*	4
Unable to provide or receive feedback due to discrepancy in language proficiency levels		4	3
Having negative feelings, such as nervousness and frustration	3	4	3
Holding different opinions		3	5*
Wasting time			3
Dislike being read		1	

When asked about their previous experience of the two collaborative writing activities, 13 students had previously experienced peer review, while only six students had experienced co-writing. This finding demonstrates that co-writing is a relatively less common teaching technique, as noted by Storch (2005) and Nixon (2007).

To sum up, students tended to enjoy the two collaborative writing activities more than individual writing, but they also reported very different advantages and disadvantages in the three writing conditions. The competing attitudes toward the three

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[16] The most frequently mentioned negative statements are highlighted with an asterisk after each.

writing activities, as reflected in answers to the open-ended questions in the questionnaires, might explain why they held different opinions in ranking their preferences across the three writing conditions.

CHAPTER SEVEN – DISCUSSION AND CONCLUSIONS

This chapter discusses the findings of the current study in relation to the quality of student writing, the nature of the students' interaction, and the students' perceptions of the three writing conditions. Following this discussion, the chapter presents implications for theories about L2 learning and implications for L2 teaching pedagogy. Limitations of the current study and directions for future research are addressed at the end of the chapter.

7.1 Discussion

Research Question 1: What are the effects of peer review, co-writing, and individual writing on CFL students' quality of writing with respect to fluency, complexity, and accuracy?

Three indices – fluency, complexity, and accuracy – were employed to analyze students' quality of writing in the three writing conditions. When writing individually, students tended to write longer sentences and to write their texts faster, but their writings were found to be significantly less accurate than in co-writing and peer review. In terms of the complexity of their written texts, a more complicated picture was presented. Students tended to be restricted in the variety of lexical use, but they tended to try out the most complex syntactic structures.

In the peer review condition, students tended to write longer sentences as well, but writing process as a whole took longer. They wrote significantly more accurately than when writing individually, and with a similar accuracy to co-writing. Both the lexical and the syntactic accuracy in peer review tended to be intermediate between individual writing and co-writing.

In co-writing, students tended to write the shortest sentences and their rate of writing was slowest. As mentioned earlier, their writing was significantly more accurate than that produced in individual writing. However, there was no difference in accuracy between the two collaborative writing conditions. In terms of complexity, students tended to use the greatest variety of vocabulary but the least complex sentence structures.

These results suggest that the three writing conditions have different effects on the quality of student writing when it is measured by different linguistic indices. This result could stem from the fact that the three writing activities direct students' attention to different aspects of their writing process. Individual writing, as might be expected, resulted in greater fluency because there was no intervention in the process. Students were able to focus on what they wanted to write without being distracted or thinking about others' feedback, as reported by many students in the questionnaire survey. The freedom of writing down their own ideas allowed students to write faster and to prioritize meaning over form (Skehan, 1998b). Co-writing, on the other hand, required two students to interact throughout the entire writing process, from the planning stage on. Students discussed both meaning and linguistic forms and needed to reach agreement before they expressed themselves on paper. This complex process resulted in the least fluent writing.

Previous research also found a tendency that students wrote longer essays in individual writing than in co-writing (Nixon, 2007; Storch, 1999; 2005), even when they spent almost double the amount of time completing tasks collaboratively (Storch, 1999). Students in Suzuki (2006) produced significantly longer essays in individual writing than in peer review. One thing to point out is that the previous studies mentioned above simply examined the number of words in student essays or paragraphs, not the length of sentences or characters per minute, as used in the current study.

With regard to accuracy, previous research has not found any significant differences comparing individual writing with peer review (Suzuki, 2006) or with co-writing (Nixon, 2007; Storch,1999, 2005) although there was a tendency that students produced more grammatically accurate writing when working collaboratively than working individually (Storch, 1999, 2005; Suzuki, 2006). In the current study, accuracy is the only index that has shown a significant difference in the three writing conditions. Co-writing and peer review resulted in significantly more accurate writing than individual writing, and the two collaborative writing conditions resulted in writing with similar accuracy. These results are important because they suggest that collaboration, whether in co-writing or peer review, enhances students' ability to produce writing that is significantly more accurate than writing produced independently. That is, when students collaborate, they preferentially attend to linguistic forms, both grammatically and lexically. They develop a reviewer's perspective in examining the writing to ensure its accuracy. Meanwhile, collaboration also offers students the opportunity to scaffold each other by correcting each other's errors or by combining their strengths in the target language to improve the writing product. Collaboration, either at the revision stage only or throughout the whole

process, creates a social context in which students are exposed to new ideas (Flower & Hayes, 1981; Flower, 1989) to new linguistic forms offered by their peers, and/or to linguistic forms that they have been exposed to but may not yet be able to produce independently (Vygostky, 1978). This exposure helps students improve their grammatical and lexical ability to perform accurately in L2 writing. Interestingly, in their questionnaires, students claimed that their writing was significantly more accurate in co-writing than in peer review or individual writing, suggesting that students had more confidence in the accuracy of their co-constructed texts than in the accuracy of their independently developed texts, whether or not they have received peer feedback.

Analysis of the complexity of student writing revealed a relatively complicated picture. With regard to the variety of vocabulary use, there was a tendency that co-constructed texts were superior to those produced in peer review, which, in turn, were superior to those produced in individual writing. However, with regard to the complexity of syntactic structures, the finding was just the opposite. Students tended to use more complex structures in individual writing than in peer review and, in turn, than in co-writing. These results suggest that students, although studying in the same class and assessed at the same proficiency level, actually have different levels of command of the target language, a finding that is supported by the analysis of student interaction in the current study and by the findings of Nixon (2007) and Well (1999). The discrepancy in their linguistic knowledge partially explains the inconsistent performance on the two complexity measures. Students with different L2 vocabulary inventories, when given the chance to co-construct a narrative, might experiment with their known but not yet internalized characters or words. The opportunity to collaborate helps students to develop

their writing, by using words they were not confident in using on their own. Individual writing, however, discouraged students from such experimentation because they did not have access to outside help and thus, had to keep their writing simple. In their questionnaire comments, students also mentioned this difference as an advantage of co-writing and a disadvantage of individual writing. That is, collaboration facilitates lexical retrieval in the process of writing.

On the other hand, there was a tendency that students were more likely to try out complex sentences when they wrote independently than when they co-constructed a text. In the questionnaire, one student pointed out that he was just writing, but had no idea whether his writing was correct. In fact, students in individual writing wrote syntactically complex sentences at the expense of grammatical accuracy. In co-writing, students produced the least complex sentences, perhaps because they had to sacrifice syntactic complexity for the sake of lexical complexity and accuracy. Being high-beginning learners, these students had a limited capacity for language processing and could not attend to all aspects of their language performance simultaneously (Meisel, Clashsen, & Pienemann, 1981; Skehan, 1998b).

Peer review resulted in writing with moderate lexical and syntactic complexity. These results could be explained in terms of the above discussion. Peer review involves both individual and collaborative work at different points in the writing process. When students write independently during the writing stage, they might use limited vocabulary and relatively complicated, but incorrect, sentence structures. At the revision stage, peer-offered suggestions and further discussion of word choices, linking devices, sentence

structures, and sentence expansions might result in improved lexical and syntactic complexity.

Previous research has examined, to a limited degree, the effects of peer review and individual writing on writing quality (Suzuki, 2006) and the effects of co-writing and individual writing (Nixon, 2007; Storch, 1999, 2005). However, no research has examined the effects of the three writing conditions on writing, and little research on peer review or co-writing has investigated writing quality with regard to the three indices used in the current study. Some of the above-mentioned studies have considered complexity or accuracy, but they employed holistic or analytical scorings (e.g., Nixon, 2007) rather than the more general measures adopted in the current study. Fluency, complexity, and accuracy are believed to provide "a broader and more balanced picture of learner language" (Ellis & Barkhuizen, 2005, p. 139), and more research of these indices are expected in the future (Ellis & Barkhuizen, 2005).

The current study has found that students write significantly more accurate texts in two collaborative writing activities than in individual writing activity. This finding, however, differs from that reported in Suzuki (2006), who found no significant difference in accuracy between individual writing and peer review. This result also differs from that of Nixon (2007), who found no difference in grammatical accuracy in student co-writing and individual writing. However, Storch (1999, 2005) reported in both studies that when completing tasks collaboratively, students produced more grammatically accurate texts than when they worked individually, but the differences were not statistically significant. In addition, in Storch (1999), time of task completion was not a controlled variable, and students actually spent twice as much time in the collaborative condition than in the

individual condition. The inconclusive findings and lack of research in the area call for more research on individual writing, co-writing, and peer review. This study is an important step in addressing this need.

Research Question 2: What kind of verbal interaction occurs when students discuss their writings in peer review versus in co-writing?

Student interaction at the revision stage in the two collaborative writing conditions was segmented and analyzed. The analysis showed that students stayed on task in both conditions. There were more episodes of student interaction in peer review than in co-writing, but no significant difference was found. Among the five types of on-task episodes, results showed a significantly greater number of LREs and CREs in peer review than in co-writing, suggesting that students attended to more language- and content-related issues in their peer review discussion. Students might have used different language forms and interpreted the pictures differently in the two conditions. These differences, which arguably stem from individual writing practice, received attention in interaction because peers may have noticed errors, encountered linguistic forms unfamiliar to them, or needed to clarify the details of stimuli. On the other hand, in co-writing these differences were likely resolved or reduced through discussion at earlier stages of planning and writing.

Two other types of on-task episode, IREs and TAEs, also showed statistically significant differences, however, with more such episodes found in co-writing interaction than in peer review interaction. The results suggest that co-writing provided students with

opportunities to constantly generate new ideas or synthesize ideas. This revision went beyond linguistic forms and extended to new ideas, which tended to contribute to more coherent and concise writing because revisions were made at the discourse level. In text-assessing episodes, students often made positive comments on the good quality of written texts or well-written linguistic items, such as sentence structures or word choices. The fact that significantly more such episodes were found in co-writing indicated that students were more satisfied with their co-constructed texts, or were more likely to assume ownership of the texts. This hypothesis was confirmed in students' questionnaire comments. In peer review, many students felt reluctant to comment on their peers' writing because of their low language proficiency level, but in co-writing, they were more confident in what they had co-constructed and enjoyed the process more.

The study also found no significant difference in text-reading episodes between the two conditions, suggesting that students spent similar amounts of time or attention in reading the texts in both peer review and co-writing.

In terms of LREs, students focused significantly more on LRE-grammar and LRE-lexis in peer review than in co-writing, with no difference found on LRE-mechanics. Further analyses of the sub-categories of the three LREs showed that significant differences in interaction on lexis mainly stemmed from the increased incidence of seeking the meanings of words used in peers' writings than in jointly produced writings, but not from discussions of word choice. The analyses of subcategories of LRE-grammar also showed that students focused significantly more on sentence meanings, word usage, and verb forms in peer review than in co-writing. Students also talked about spelling

significantly more in peer review than in co-writing, as revealed in the analysis of LRE-mechanics.

These results are consistent with the fact that students encountered more linguistic issues in their peer review interactions than in their co-writing interactions. The findings suggest that students had different levels of mastery of the target language, despite being in the same class. In peer review, many episodes involved students asking their peers for the meanings of vocabulary and sentences in their peers' writing. Students were either unfamiliar with the words their peers used in writing or were unable to interpret the sentences their peers produced. This finding also suggests that although the vocabulary students used in peer review varied less than in co-writing (as reported in sections 4.2.4 and 7.1.1), the vocabulary use of partners in pairs differed.

Students in both peer review and co-writing directed a great deal of attention to sentence-level negotiations. This finding is consistent with those reported in previous research on low proficiency students' peer review interactions (Nelson & Murphy, 1992a, 1992b, 1993; Paulus, 1999; Suzuki, 2006; Villami & De Guerrero, 1998). However, detailed analysis of language-related episodes in the low-proficient L2 learners' interaction was limited.

Existing research on the content of co-writing interactions (Storch, 2005) presents results that cannot be compared with those in the current study because in Storch (2005), the content of negotiation was examined throughout the whole process of writing, rather than in the revision stage exclusively. While research on peer review and co-writing has also examined social dynamics (e.g., De Guerrero & Villamil, 1994; Lockhart & Ng, 1995; Storch, 2001, 2002, 2003) and negotiation strategies (Mendonca & Johnson, 1994;

Nixon, 2007), few research studies have examined what students discuss in their interaction negotiations, and no study has compared the two collaborative activities of co-writing and peer review. Thus, no research is available for a meaningful comparison with the findings on the nature of student interaction in the current study.

Research Question 3: How do students perceive individual writing, co-writing and peer review?

Four questionnaires were administered to determine what students thought about the three writing activities, once they had experienced them. The quantitative analysis of the ranking scale questions in the perception questionnaire revealed the findings summarized below, which were supported by students' responses to the open-ended questions.

Among the 10 statement sets, the results of two statement sets revealed statistically significant differences. Students liked revising their essays in co-writing and in peer review significantly more than in the individual writing condition, but no statistically significant difference was found between the co-writing and peer review conditions. This finding suggests that participants valued their partners' input and constructive suggestions when they were given the opportunity to work collaboratively, especially when they collaborated on revisions. This finding is consistent with that reported in many previous studies (e.g., Jocobs et al, 1998; Mangelsdorf, 1992; Mendonca & Johnson, 1994; Nelson & Murphy, 1992a, 1992b; Nixon, 2007; Paulus, 1999; Riley, 1995; Tsui & Ng, 2000; Miao et al., 2006). In their written responses to the open-ended questions, students explained that collaboration not only enabled them to receive constructive

feedback from peers, but also created a scaffolding environment so they could help each other and complement each other's strengths.

A statistically significant difference was also found in students' preferences with respects to the accuracy of their writing. Students believed that their writing was significantly more accurate in co-writing than in peer review and in individual writing. Although students tended to prefer peer review over individual writing, no significant difference was observed. The results suggest that students perceived their writings to be of higher quality when there was more interaction and when this interaction started at an earlier stage of the writing process (i.e., at the brainstorming and writing stages), rather than only at the final revision stage of the writing process. This preference was confirmed in the analysis of students' written comments. In discussing the advantages of co-writing, students most frequently cited the mutual support provided to each other and the opportunity to contribute their own strengths to writing. For example, one partner might be strong in characters, and the other in pinyin; one might be good at grammar, and the other at vocabulary, etc. Their strengths in the target language seemed to complement each other and contribute to greater accuracy in their joint writing. Interestingly, the analysis of the accuracy of student writing rendered a somewhat different finding. It was found that students' writing was significantly more accurate in the two collaborative writing conditions than in the individual writing condition, and that there was no difference between the two collaborative writing conditions. These results suggest that students were less confident in their independently developed written texts, even though they were revised based on their peers' comments and even though they were as accurate as their co-constructed texts.

Participants tended to prefer co-writing to peer review, and in turn, peer review to individual writing for six aspects of writing, but these preferences did not differ significantly, based on statistical analysis. The six aspects in question are (1) the writing process, (2) the essay planning stage, (3) sentence complexity, (4) organization or cohesion of their essays, (5) vocabulary range, and (6) the overall writing product. For the first two aspects of writing, the preference pattern suggests that participants liked to have more opportunities to exchange ideas in the process of writing, especially in the brainstorming session when they could discuss how to interpret the pictures. This finding is not surprising in light of participants' written comments on the benefits of each writing condition. An oft-mentioned strength of co-writing is that it provided an opportunity to combine ideas. Flower and Hayes (1981) highlighted the importance of idea generation and information organization as crucial stages in the writing process. When students were provided opportunities to exchange ideas, they could develop better ideas and gather more information in essay writing. Actually, the analysis of student interaction showed that in co-writing, students carried forward this idea generation process from the beginning stage to the revision stage. This same pattern was found in the other four aspects of writing, suggesting that these low proficiency language learners worked collaboratively to make better use of their combined linguistic knowledge to generate more complex sentence structures and to employ richer vocabulary, and that they also liked their essay organization and overall writing practice. Students claimed that they received constructive and valuable comments and suggestions and learned new structures and vocabulary from their peers. Sharing their linguistic knowledge and writing skills were believed to help them in their writing. However, as shown in the results of the

analysis of writing complexity, students did use a wider variety of vocabulary in co-writing than in peer review and, in turn, in individual writing. However, they used the least complex sentence structures in co-writing and the most in individual writing, even though they perceived the opposite in the questionnaire survey. This finding again suggests that the high-beginning language learners were not confident in their own writings.

On the other hand, students also expressed preference for peer review over co-writing and individual writing in the writing stage and in terms of their satisfaction with the content of their writing; however, this preference pattern failed to reach statistical significance. Considering the advantages and disadvantages students commented on for the three writing conditions, we can understand the reason for this preference. On the one hand, students preferred to work collaboratively because they could help each other and learn some new ideas and language forms from their peers. On the other hand, the individual writing stage in the peer review condition made it possible for them to write down their own thoughts without sacrificing their own ideas to achieve a consensus. Thus, they had a better sense of ownership of what they wrote and liked the content of their own writing.

A very different trend was observed when comparing statements regarding writing fluency under the three writing conditions. Students favoured individual writing over peer review, and peer review over co-writing; however, this preference pattern did not yield statistically significant differences. Students claimed that they wrote more in the individual writing condition than in the peer review condition and than in the co-writing condition. A few possible factors may explain this preference. First, when they worked

individually, the participants did not need to negotiate with others or take others' opinions into consideration. Thus, without distraction they could work at a faster pace. Some students mentioned that one of the advantages of individual writing was that they enjoyed working at their own pace, and some students mentioned that co-writing wasted time. Another possible reason why students worked at a faster pace might be that they did not know how to express themselves because of their limited linguistic knowledge, so they just wrote without knowing whether their writings were right or wrong, and without worrying that their writings would be read by their peers.

Despite the preference trends for the above-mentioned aspects of writing, we must acknowledge the fact that there was no statistically significant difference among the three writing conditions, except for two aspects of writing, i.e., revision and accuracy. There are several possible explanations for the non-significant difference. First, the pair configuration might affect participants' preferences. The random pairing caused notable discrepancies in the language proficiency levels in several pairs. Both the lower level participants and the more advanced ones mentioned that they would have provided very different answers in the questionnaire survey had they worked with a different partner or with someone with a similar proficiency level. Students seemed to prefer working with people who shared similar linguistic knowledge. Another explanation for the non-significance is that the three writing conditions exhibited competing advantages, which made it hard for participants to decide that one was significantly better than the others. Analysis of the positive attitudes toward the three writing conditions also revealed that students found very different advantages in each writing condition.

When answering the open-ended questions, students expressed both positive and negative attitudes toward the three writing conditions. There were more positive statements concerning the two collaborative writing conditions than the individual condition (54 and 54 versus 28, respectively), suggesting that students liked the two collaborative writing conditions more than the individual writing condition. More students also reported that they did not see any problems in the collaborative writing conditions compared to the individual writing condition. The tendency for students to favour the collaborative writing conditions was also found when the students were asked to rank the three writing conditions. Individual writing was ranked lowest among the three writing conditions; however, there was no significant difference among the rankings.

The three most frequently mentioned positive attitude statements concerning co-writing are: (1) it provided mutual support, (2) it helped them combine ideas, and (3) the activity was interesting and they had more confidence. Similar claims are also found in Nixon (2007) and Storch (2005). The three most frequently mentioned positive statements concerning peer review are: (1) it helped them develop a reviewer's perspective, (2) they received constructive and valuable comments on their writing, and (3) they were exposed to different ideas and language forms. These benefits of peer review are in line with the benefits reported in previous studies (e.g., Jacobs et al., 1998; Mangelsdorf, 1992; Mendonca & Johnson, 1994; Nelson & Murphy, 1992a, 1992b; Paulus, 1999; Riely, 1995; Tsui & Ng, 2000; Miao et al., 2006). The three most frequently mentioned positive statements concerning individual writing are: (1) they enjoyed the freedom in writing, (2) they became aware of their own strengths and weaknesses, and (3) they were pushed to use the target language. Examination of the

positive attitude statements demonstrates that students held competing attitudes toward the three writing conditions; namely, each of the three writing conditions had its own strengths, and these could not be replaced or overridden by the advantages of the other writing conditions. Nixon (2007) also found that Thai EFL students, on the one hand, preferred co-writing to individual writing; and on the other hand, acknowledged finding it hard to determine their preference because of the competing advantages of the two writing conditions.

Unlike the wide range of positive attitudes across the three writing conditions, students expressed some common negative attitudes toward the three writing conditions. For example, in all three conditions, the students stated that they encountered difficulties in writing, and complained that they were not allowed to consult their textbooks. In the individual writing condition, the majority of the students (13 of 18 students) complained that they were not able to seek help from peers, a comment that reflected their preference for collaboration. In both collaborative writing conditions, students found that their limited knowledge of the target language made it difficult to collaborate with their peers because neither of them knew how to express their ideas and suggestions, a problem also mentioned by students in Storch (2005). Another disadvantage of collaboration is that students found it hard to compromise when they held different ideas, a typical issue for collaborative work. Actually, the most frequently mentioned advantage of individual writing is that students enjoyed the freedom and independence to express their own ideas and thoughts without having to take their partners' different opinions into consideration. These results suggest that students develop a better sense of ownership of writing that they compose individually.

In summary, analysis of the student questionnaires shows that while students tend to favour collaborative writing to individual writing, they hold competing attitudes about the three writing conditions. Each condition has its unique strengths and drawbacks, and it is not possible to obtain all advantages or quell all disadvantages by choosing a single method.

7.2 Conclusions

The findings of this study pertaining to writing quality, the content of student interaction, and student perceptions of writing conditions, all suggest one common finding: Peer review, co-writing, and individual writing play different roles in Chinese L2 learners' development of writing skills, and thus are all important because they direct learners to different aspects of their language development.

Specifically, peer review and co-writing direct students' attention to the accuracy of their written texts, enable them to retrieve more lexical knowledge, and create an informative negotiation opportunity that students prefer. However, it is inappropriate to claim that co-writing builds an environment more favourable for L2 learning, simply because L2 writers exchange ideas and collaborate from the beginning of the writing process, as argued by some SLA researchers (Hirvela, 1999; Nixon, 2007; Storch, 2005). The current research has found no difference in writing accuracy or students' preferences of the revising stage in the two collaborative writing conditions. In addition, students use a wider range of vocabulary in co-writing, but more syntactically complex sentence structures in peer review. In their verbal interactions, students attend more to verb forms,

word usage, and spelling in peer review, but focus more on sentence structures, sentence expansions, and ideas in co-writing. Students also believe the two collaborative activities have their own strengths. The seemingly complicated results suggest one thing: that peer review and co-writing are two different collaborative writing activities, with no one definitely better than the other, as measured by a range of linguistic indices and as revealed by students' evaluations.

The current research has also found that students in individual writing prioritize meaning over language forms, as found in both the analysis of writing quality and the analysis of student questionnaire comments. Another advantage of individual writing is that students value their independence in developing their own ideas. This strong claim is facilitative to building up students' ownership of their writing and helping them to become independent writers.

7.3 Theoretical Contributions

One of the important aspects of the current study is that it examines the roles of two collaborative writing activities in L2 writing, co-writing and peer review. No previous research has provided a comprehensive comparison of these writing conditions, taking into consideration the written texts, the interaction content, and students' preferences. It is important to conduct research that examines the two collaborative writing activities, especially in face of the argument that co-writing is more effective than peer review, though they both engage L2 learners in collaboration (Hirvela, 1999; Nixon, 2007, Storch, 2005). The researchers believe that co-writing provides an opportunity for

language learners to discuss and co-construct texts during the whole process of writing, unlike peer review which directs the collaboration only to the product of writing.

Two theories underpinning the significance of collaboration are cognitive writing process theory and social-constructivist theory. The findings of this study have provided support to the claim made by the two theories. Cognitive writing process theory highlights the importance of multiple drafts and multiple stages of writing and, more importantly, a recursive thinking process where planning, writing, and revising repeatedly occur in different stages of writing (Flower & Hayes, 1981). Social-constructivist theory emphasizes the importance of social context in knowledge development, including linguistic knowledge such as vocabulary and grammar (Vygostky, 1978, 1986).

The results of the current study show that students are actively involved in idea generation in the revision stage of both writing conditions. The interaction creates a context in which students are exposed to feedback and new ideas from their peers (Flower & Hayes, 1981). The new ideas cover a broad span, including different linguistic forms and newly generated meanings to develop the narrative. At the same time, these new ideas are constantly being modified, and news goals are set, influenced by the negotiations with peers in interaction. This recursive thinking process is found to occur in both peer review and co-writing interactions. However, the results also reveal that students focus on different aspects of writing in their interaction. For example, significantly more LREs occur in peer review than in co-writing interaction, but significantly more IREs occur in co-writing than in peer review. This pattern suggests

that students attend more to linguistic forms in written texts in peer review, but more to ideas about what to write in co-writing.

Significantly more LRE-lexis and LRE-grammar episodes occur in peer review than in co-writing. The large number of LRE-lexis and LRE-grammar episodes in peer review are related to the clarification of word meanings, phrase meanings, and sentence meanings. That is, students use words and sentences that their peers do not understand or are unfamiliar with. It is expected that the exposure to such a large amount of new linguistic forms will influence students' writing in the future, because these linguistic forms are likely to be within the students' ZPD (Vygotsky, 1998). It is likely that students requested clarification of the meanings of these forms because they forgot the words or sentence structures they had learned in class or were not able to use them in their own writing. The help provided by their peers may trigger their memory of the forms that they have learned, and they may be able to use them in their future writing as well. Students also claim that they are able to draw on their own strengths and help each other to produce better writing in such collaboration. Peer feedback is greatly valued as well. These findings suggest that interaction indeed provides an opportunity where students can scaffold each other to write better texts. The linguistic forms they experiment with in writing and discuss in negotiation could be internalized and consolidated for future use as well.

A significant contribution of the current study is that it was the first study to examine the roles of the two collaborative writing activities and individual writing in L2 writing. The study presents the following results with respect to students' written texts: (1) students produced equally better writing quality in both collaborative writing conditions

than in individual writing; (2) co-writing tends to feature greater variety of vocabulary use than peer review; and (3) peer review products exhibit more complex syntactic structures than co-writing. To interpret the results, we find that the two collaborative writing conditions have the same effect on writing using some measures, but that they may also have opposite effects on writing using other linguistic measures. This finding suggests that contrary to the hypotheses of some researchers (Hirvela, 1999; Nixon, 2007, Storch, 2005), co-writing does not have a more facilitative influence on L2 writing than peer review. However, we acknowledge that the interactions in co-writing do have positive impacts on students' writing, but that they may lead to different foci than other methods of collaborative writing, such as peer review.

The findings of the current research suggest that we should take multiple perspectives when we infer practical implications from theories. To examine language learners' task performance, the three linguistic measures – fluency, complexity, and accuracy (Skehan, 1998b) – and a detailed analysis of the content of student interaction should be employed in more research on students' writing performance because taken together, they provide a more comprehensive and multidimensional view.

7.4 Pedagogical Implications

The findings of the current study have several important pedagogical implications for L2 instruction. First, co-writing and peer review, as effective writing activities that help direct students' attention to linguistic accuracy, should be encouraged in students' practice of writing. The current study has found that about 70% of clauses students wrote

in the two collaborative writing conditions contained no error; however, there were only 56% of error-free clauses in students' independently produced writing. The differences between the two collaborative writing conditions and the individual writing condition were statistically significant. Although peer review and co-writing may encourage students to write shorter and less syntactically complex texts, they also encourage students to focus on the well-formedness of the target language. In the process, it is expected that the well-formed linguistic forms produced in this writing condition will eventually become internalized in their intra-psychological plane. Once this process is complete, they will then be better able to direct their attention to fluency and syntactic complexity. With increased practice, they will be able to write better quality texts that exhibit the three important qualities of accuracy, fluency, and complexity. Meanwhile, as suggested by social-constructivist theory (Vygostky, 1978, 1986) and findings in the current and previous research (e.g. De Guerrero & Villamil, 1994, 2000; Moll, 1989; Nassaji & Swain, 2000; Nassaji & Tian, 2010; Nyikos & Hashimoto, 1997; Swain & Lapkin, 1998; Villamil & Guerrero, 1996, 1998), collaboration creates mutually supportive zones of proximal development. Students can collaborate with their peers and work within their ZPD to produce language that they can use independently in the future.

Another important implication for language instruction is that L2 teachers could use different activities when they intend to achieve different goals in teaching. This study has found that the three writing activities have played different roles in students' writing. They exhibit different effects on the quality of writing, as captured by different linguistic measures. Although students produced significantly more accurate narratives in the two collaborative writing conditions, individual writing tended to encourage students to write

more fluently and more syntactically complex sentences. Meanwhile, there was no difference observed between peer review and co-writing in terms of accuracy, and students tended to pay more attention to lexical complexity and less to syntactic complexity in co-writing than in peer review and individual writing. That is to say, students focus on different linguistic issues in their interaction, and they also have competing attitudes toward the three activities. No activity is absolutely better than any other. When the focus of instruction is on accuracy and vocabulary use, exposing students to different ideas and how to express them in writing, and/or building up their confidence in the target language, students might be assigned to co-construct a text. When the instruction focus is on improving accuracy and experimenting sentence structures, or developing a reviewer's perspective, students could be asked to write independently and then peer-review each other's writing. Individual writing could be used when students need to enhance their fluency in producing texts, or be pushed to use the target language, such as in examinations.

Last but not least, the findings of the study also imply that teacher feedback or comments still play a significant role in students' language learning development and writing skills improvement. Although students' writing accuracy is significantly higher in the two collaborative writing than in individual writing, only 70% of their sentences are error-free. The fact of 70% of sentences error-free suggests, on the one hand, that peer support and feedback in collaborative writing results in more accurate writing; on the other hand, this fact also suggests that students still need teachers' help to continue to make improvements in the accuracy of their writing. Students have significantly more discussion on lexis in peer review than in co-writing, and more discussion at the sentence

level in co-writing than in peer review; however, analysis of the complexity of student writing reveals the opposite pattern. These findings also suggest that discussion does not necessarily lead to corrected forms (Nassaji & Tian, 2010). As revealed in some research, students may even change their correct forms to incorrect forms, following negotiation (Hawkes, 2007, Storch, 2002, 2003). In fact, when I asked the students in this study if they had any further comments on the three writing activities, some mentioned that it would have been more helpful to receive feedback from the teacher. Students do not see themselves as very competent writers at this level. The findings of the current study do not imply that teachers should or could be excluded from students' writing practice simply because students can help each other. The findings only imply that students could benefit from these student self-monitoring learning activities. However, teachers' monitoring and feedback could enhance their confidence in their language production and expose them to more accurate language forms in their learning process.

7.5 Limitations and Implications for Future Research

There are a number of limitations to the current study. First, there was a relatively small number of participants in the study:18 students completing three tasks. The small sample size might explain the lack of significant findings on some measures, especially in the analysis of writing quality and student perceptions. Thus, this study should be replicated with more participants, in the hope that a larger sample size might lead to significant findings.

Another limitation is that the study focused on student negotiation at the revision stage. This choice was made because the purpose of this study is to examine what kind of interaction occurs at this stage in the two collaborative writing conditions. Moreover, the revision stage is the only one in which interaction is involved in both collaborative writing conditions, and thus, this stage provided the only legitimate basis for comparison. However, student interaction during the planning and writing stages in co-writing was not analyzed; thus, we are uncertain as to what students focus on in earlier stages of writing. It is posited that students do not have as many language- and content-related discussions in co-writing as in peer review because they may have attended to many of these issues in their earlier writing and planning stages. The interpretation of these findings would be more reliable if discussion at all stages of writing in co-writing were analyzed. Thus, future studies can be conducted to further examine the nature of interaction throughout the writing process and the relationship between the writing stage and the revision stage.

A third limitation is that this study did not examine the extent of improvement in writing in the three different writing conditions, but only focused on the quality of the final writing products. One of the aims of the current study was to examine the effect of the three writing conditions on writing using three linguistic measures: fluency, complexity, and accuracy. As such, the study focused on learners' language performance, not the process of writing development. Future research could be carried out to examine what kind of language learning occurs and what changes and/or improvements students make during the process of writing. It is meaningful to examine the effects of different revision conditions on students' writing improvement and to examine what kinds of revision students actually make in the three revision conditions.

Since the current study is the first and the only study to examine all three student self-monitoring writing activities when teacher feedback is not available, the findings of the current study cannot be directly compared to any previous research. Thus, it is difficult to draw any firm conclusions or to make general claims about the role of the three writing conditions in L2 writing. Future research that replicates the current study design will provide a context with which to examine the generalizability of findings of the current study.

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APPENDIX 1: TASK COMPLETION INSTRUCTIONS

Individual Writing

1. Work individually for 5 minutes to study the pictures and think what you would write to describe each picture.
2. When you are ready, you will start to write a written version of the story in 30 minutes.
3. Write at least three sentences to describe each picture.
4. When you finish, save it on the desktop with NAME_WR_IN as the file name.

5. Save your draft with another file name, using NAME_RE_IN.
6. Revise your first draft (the RE file) and finalize your writing in 15 minutes.
7. When you finish, save it on the desktop.

Peer editing

1. Work individually for 5 minutes to study the pictures and think what you would write to describe each picture.
2. When you are ready, you will start to write a written version of the in 30 minutes.
3. Write at least three sentences to describe each picture.
4. When you finish, save it on the desktop with NAME_WR_PE as the file name.

5. Save your draft with another file name, using NAME_RE_PE.
6. Work with your partner to provide feedback on each other's writing (the RE file), 15 minutes on each writing.
7. When you finish, save it on the desktop.

Co-writing

1. Work for 5 minutes with your partner to study the pictures and discuss what you would write to describe each picture.
2. When you are ready, you will start to write a written version of the in 30 minutes.
3. Write at least three sentences to describe each picture.
4. When you finish, save it on the desktop with NAME_WR_CO as the file name.

4. Save your draft with another file name, using NAME_RE_CO.
5. Work with your partner to revise your writing in 15 minutes.
6. When you finish, save it on the desktop.

APPENDIX 2: STUDENT PERSONAL PROFILE AND ACADEMIC BACKGROUND QUESTIONNAIRE

1. Name: _____ 2. Gender: _____
3. Age: _____ 4. First language: _____
5. Dominant language: _____ 6. Current year of study: _____
7: Major: _____
8. Do you speak other languages? Yes / No
   If yes, what languages do you speak? _____
9. Is there anyone in your family who speaks Chinese? Yes/No
   If yes, who are they? _____
10. When did you start to learn Chinese? When I was _____ years old.
11. Did you learn Chinese before going to university? Yes/No
    If yes, how long did you learn Chinese at that time? _____ years _____ months
12. Have you ever been to a Chinese speaking country to learn Chinese? Yes/No
    If yes, how long did you learn Chinese in a Chinese speaking country? _____
    Where did you go? _____
13. Have you had experience in writing Chinese on a computer? Yes/No
    If yes, how often do you write Chinese on a computer? _____
    Do you find it easier to write Chinese on a computer or on a piece of paper? ___
14. What's the purpose of studying Chinese?

_____

_____

_____

_____

_____

15. Do you prefer to work individually or collaboratively? Please circle your preference.

Why do you have such preference?

_____

_____

16. What do you think are your writing strengths in English?

17. What do you think are your writing weaknesses in English?

18. What do you think are your writing strengths in Chinese?

19. What do you think are your writing weaknesses in Chinese?

APPENDIX 3: THREE RESPONSE QUESTIONNAIRS ADMINISTERED AT THE END OF THE THREE WRITING TASKS

Immediate Questionnaires for the Individual Writing Condition

Name:_____

1. What were some of the things you liked about this writing activity?

_____

_____

_____

_____

2. What were some of the things you did NOT like about this writing activity?

_____

_____

_____

_____

3. Can you describe the experience of writing alone to produce the paper?

_____

_____

_____

_____

4. What were the problems you had in working alone to produce the paper?

_____

_____

_____

_____

5. What were the good things about working alone to writing the paper?

_____

_____

_____

_____

Immediate Questionnaires for the Peer Editing Condition

Name:_____

1. What were some of the things you liked about this writing activity?

_____

_____

_____

_____

2. What were some of the things you did NOT like about this writing activity?

_____

_____

_____

_____

3. Can you describe the experience when you edited your partner's paper?

_____

_____

_____

_____

4. Can you describe the experience when your paper was edited by your partner?

_____

_____

_____

_____

5. What were the problems you had in editing each other's paper?

_____

_____

_____

_____

6. What were the good things about editing each other's paper?

_____

_____

_____

_____

7. Did you have experience in peer editing before? In what course(s)? When?

_____

_____

_____

_____

Immediate Questionnaires for the Co-writing Condition

Name: _____

1. What were some of the things you liked about this writing activity?

_____

_____

_____

_____

2. What were some of the things you did NOT like about this writing activity?

_____

_____

_____

_____

3. Can you describe the experience of writing with your partner to produce one paper?

_____

_____

_____

_____

4. What were the problems you had in writing with your partner to produce one paper?

_____

_____

_____

_____

5. What were the good things about writing with your partner to produce one paper?

_____

_____

_____

_____

6. Did you have experience of co-writing before? In what course(s)? When?

_____

APPENDIX 4: ATTITUDE QUESTIONNAIRE

Name: _____

Dear student,
Thank you very much for participating in this project, in which you have experienced writing short narratives in Chinese under three different conditions: individual writing, collaborative writing, and peer editing. The following is a questionnaire which asks for your reflections on the three writing tasks. Please recall your experience and answer the questions below.

Directions: For each task, circle the number that most accurately describes your opinions about each statement.

1. strongly disagree 2. disagree 3. somewhat disagree
4. somewhat agree 5. agree 6. strongly agree

	worked individually	worked collaboratively	peer edited with another student
1. I liked the writing process very much when I …	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
2. I liked planning my essay very much when I …	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
3. I liked writing my essay very much when I …	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
4. I liked revising my essay very much when I …	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
5. I wrote more when I …	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
6. I wrote with a greater accuracy when I …	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
7. I wrote more complex sentences when I …	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
8. I liked the content of my writing very much when I …	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
9. I wrote a well-organized and cohesive essay when I …	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
10. I used a wide range of vocabulary when I …	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6

1. Overall, do you have any preference among the three writing tasks (individual writing, collaborative writing, and peer editing)? YES / NO

If yes, please answer question 2.

If no, please answer question 3.

2. If you had preference among the three tasks (individual writing, collaborative writing, and peer editing),

(2a) which was (were) your most preferred writing task(s), and why?

(2b) which was (were) your second preferred writing task(s), and why?

(2c) which was (were) your least preferred writing task(s), and why?

3. If you had no preference among the three writing tasks (individual writing, collaborative writing, and peer editing), can you please explain why?

4. Do you think you have benefited from participating in this study? YES / NO

5. If yes, what were the benefits?

6. Do you have any other comments about your writing experience in this project?

Thank you again for your interest and cooperation!

APPENDIX 5: PARTICIPANT CONSENT FORM

Participant Consent Form

The effects of peer editing versus co-writing on writings in Chinese-as-a-foreign language

You are invited to participate in a study entitled "The effects of peer editing versus co-writing on writings in Chinese-as-a-foreign language" that is being conducted by me, Jun Tian. I am a Ph.D. candidate in the Department of Linguistics at the University of Victoria and you may contact me if you have further questions by jtian@uvic.ca. As a graduate student, I am required to conduct research as part of the requirements for a degree in linguistics. It is being conducted under the supervision of Dr. Hossein Nassaji. You may contact my supervisor at 721-7432.

This research is being funded by Social Sciences and Humanities Research Council of Canada. The purpose of this project is to examine the effectiveness of different writing activities on writings among adult Chinese second language learners. Research of this type is important because, theoretically, the research findings will increase our knowledge regarding different types of writing activities, and especially, the research will enrich the field by investigating writings in Chinese-as-a-foreign language, a language that is gaining more interests of second language learners and has not received as much research attention as English, French, Spanish. In practice, the study will stimulate post-secondary second language educators to reflect upon the effectiveness of their language teaching methods involving collaborative learning. You are being asked to participate in this study because you are studying the language that I am interested in investigating and are at the language proficiency level to complete the tasks.

Your participation is completely voluntary. In order to give all students an equal opportunity to practice writing, all students will write three short narratives on computer, one writing a week. Each visit lasts for less than one hour. It is anticipated that a total amount of 3.5 hours is required. You will complete a background questionnaire, three questionnaires on your response to the tasks, and a questionnaire on your preference of the types of writing. Your interaction with a partner will be video-recorded. Your in-class writing in the sixth week will also be used a part of the data. If you agree to voluntarily participate in this research, I will retrieve your information as data for analysis, and the others' will be destroyed after the course grades are submitted and before I start data analysis. Although I am the instructor of the class, you should not feel obliged to participate. To help prevent this relationship from influencing your decision to participate and to ensure that your (non)-participation and performance will not affect your course grades in any ways, Data analysis will NOT be conducted and your consent form will NOT be released to me until the course grades are submitted. The potential benefits of your participation in this research include that you will be exposed to different writings and different ways to express your meanings, that you have extra opportunities to practice the target language, that second language educators will learn more about different writing activities, and that the field will be enriched by investigating writings in Chinese. Your participation in this research must be completely voluntary. If you do decide to participate, you may withdraw at any time without any

consequences or any explanation. If you do withdraw from the study, your data will be excluded from analysis. If you change your mind at any time, you may contact the recruiter at kkaneko@uvic.ca. You will be reminded of your right to withdraw in every data collection session.

All participants will be given pseudonyms when I analyze data and report my findings. Except for myself and the recruiter, no one will have assess to your real name. Your confidentiality and the confidentiality of the data will be protected because all documentations will be kept in my place of residence. To help protect confidentiality, please do not release your partner's performance when he or she works with you so that your own performance could be protected as well. With your permission, I plan to keep the data set in an anonymized form for possible future analysis. It is anticipated that your image might be released in conference presentations. The results of this study will be shared with others in the form of dissertation, publications, and presentations.

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

Your signature below indicates that you understand the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researchers.

_____	_____	_____
Name of Participant	*Signature*	*Date*

I consent for videos to be taken of me for analysis _____ (initials) and dissemination _____ (initials). Confidentiality is limited if my video will be released for dissemination. I consent for the researcher to retain my video indefinitely for any future project and publications by the researcher _____ (initials).

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

APPENDIX 6: TRANSCRIPTION CONVENTIONS

Regular	discourse originally spoken in English
Chinese characters	discourse originally spoken in Chinese
"Chinese characters"	reading written text
Regular fonts below Chinese characters	Pinyin – Romanized Chinese writing system
Italics	English translation
xxx	words/phrases difficult to decipher
CAPITAL/dotted character	emphasis
(Brackets)	explanation of the discussion or of the written discourse regarding whether or what error is contained
[square brackets]	emotions e.g. [surprise] or [laughing], and body language e.g., [nodding]
<arrow brackets>	additional information e.g., <self correction>
p-i-n-y-i-n	spelling out the pinyin of a character
?	questions or rising intonation
(.)	short pause
(#)	longer pause, the number in the brackets indicates the length of the pause in seconds
:	Elongation of a syllable
//	overlap
-	Unfinished sentence, or unfinished word

Words that were pronounced in non-standard form were transcribed in a way close to what was produced.

APPENDIX 7: WRITING SAMPLES

Writing sample 1: (Individual Writing Condition)

马力是加拿大人。他去了中国，学汉语在大学。他每天练习汉语语法。
马力喜欢喝咖啡。他常常听了中国人说。 每天他明白了很多。
以后晚饭马力去了图书馆。他想看了三个中国书。他也喜欢看中国电影。
马力和一个朋友一起汉语说。他汉语很不错。星期二，星期四，星期五 他去了汉语课。
二月马力去了回家。他觉得中国很票亮！他去出加拿大在飞机。
马力有一白张照片！他张照片很票亮。他中国过了很好！

Writing sample 2: (Peer Editing Condition)

马力六点钟起床。今天的天气暖和。每天他一起床，就吃早饭。

每天他吃早饭的时候，马力喜欢 喝一杯牛奶， 吃片面包。他也喜欢看报纸。要是他没有牛奶，他喝一杯水。

马力骑自行车去大学。今天他骑很快，常常骑慢有一点。他八点 钟上英语课。

马力觉得英语课很有意思。 他的朋友常常睡觉！十点钟下英语课。

五点晚上马力和三个朋友去打球。马力有作业很多！今天晚上他想看电视。

马力六点晚上回家。他和女朋友一起吃晚饭。他们吃日本饭，喝两杯酒。

Writing sample 3: (Co-writing Condition)

她是王英. 她想去市中心见面她的朋友。今天上午她等公共汽车
。

王英和她的朋友在商店买东西。她们喜欢去买东西。
她的朋友给她小礼物，因为今天是她的生日。
祝王英生日快乐！她们唱歌唱得非常好。她们要吃蛋糕。

王英在家看电视。她现在看天气预报，因为明天她想去海边散步。

王英病了。她在家里休息。她给医生打电话.

他现在在医院看医生。 她说 医生 她肚子疼。
医生让她吃药.