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以社會文化理論探討台灣地區大學生在線上同儕評改中的社會互動模式

Exploring Taiwanese College Students' Social Scaffolding Interaction
in On-Line L2 Peer Revision through a Sociocultural Approach

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中文摘要

　　過去數十年，同儕評改於第二語言寫作領域中已大量被討論及應用。值得注意的是，相關文獻多僅探討同儕評改之影響與效果。然而，極少研究將同儕評改視為一社會建構過程，因而忽略探討其社會文化層面。

　　本研究透過 Vygotsky (1978) 的社會文化理論 (sociocultural theory) 檢視在為期一學期大學英語寫作課中的三次同儕評改活動。研究目的在於探索線上同儕評改中所產生的互動型態、參與者由語言認知調節階段 (cognitive stages of regulation) 中所呈現的社會關係、以及參與者所接受之協助及其認知調節階段之關係。研究資料收集自參與者進行同儕互評的即時通訊 (IM) 紀錄。研究者修改 de Guerrero 及 Villamil (1994) 和 Wood、Bruner 及 Ross (1976) 所提出之基模，以將參與者的同儕互動種類、認知調節階段、社會關係、及鷹架式協助予以編碼及分類。

　　研究結果顯示，參與者在透過電腦為中介的同儕評改中，除了仍保有五種面對面溝通的互動模式，更創造出一種透過網路尋求協助的同儕互動形式。在此互動模式中，參與者藉由網路虛擬專家（如：線上字典、翻譯軟體）的協助，得以在認知階段上獲得成長及進行線上即時的評改討論。再者，參與者之間的社會互動關係不僅呈現出個人認知調節階段上的差異，更反映出同儕間的角色認知與其變動。另外，參與者所接受之協助及其認知階段間的高相關性，更凸顯出同儕可感知彼此最大發展區 (Zone of Proximal Development; ZPD) 並給予適當協助之能力。最後，本研究也呈現出網路溝通所帶來的社會文化影響、同步溝通的 E 化語言、以及不具鷹架式協助作用的同儕互動。依據研

究結果，研究者也指出本研究之缺失，及提出針對英語教學上的應用與未來相關研究之建議。

Abstract

Peer revision as an aid to process writing in the second language (L2) classroom has been amply discussed and employed in the past decades. As a complicated practice encompassing both cognitive and social aspects of language, yet it has mostly been explored for such cognitive issues as impact and effectiveness. Little literature has looked into its sociocultural dimension, in which peer revising behaviors, as one kind of language use and learning, are considered to be a socially constructed process of collaboration, interaction, and communication (Barnes, 1976; Cazden, 1988; Vygotsky, 1978).

The study adopted Vygotsky's sociocultural theory as the theoretical framework to examine three writing cycles of L2 peer revision sessions in an 18-week, college-level English writing course. A total of 20 pairs of the students were recruited as the target participants due to their rich and representative instant message (IM) protocols. To probe the nature of electronic peer interaction, the study aimed to explore three sociocultural dimensions of peer revision via an on-line medium – the types of interaction between members of a dyad, the kinds of social relationships from the participants' cognitive stages of regulation, and the relationships between the participants' cognitive status and their received scaffolding. Data were collected from instant conversation logs. The data were analyzed based on five coding schemes – four were adapted not only from those of de Guerrero and Villamil (1994) for types of episodes, types of on-task episodes, cognitive stages of regulation and social relationships, and the other one was adopted from Wood, Bruner, and Ross (1976) for scaffolding functions.

The results showed that the peers, in addition to engaging in the five traditional revision episodes, would also create a new CMC facilitated interaction type, in which on-line sources might serve as virtual experts scaffolding to activate deeper communication and to move the

peers forward to higher levels of cognitive stages. Moreover, the changing social relationships between the reviewers and reviewees revealed not only the peers' symmetrical/asymmetrical cognitive status but also their dynamic role awareness and shift. Furthermore, the high correlation between the peers' regulatory stages and the scaffolding received displayed the peers' sensitiveness to each other's ZPD. In addition to the three abovementioned findings, the social impacts of synchronous CMC, the electronic variety of language, and the non-scaffolding assistance were also found. Finally, pedagogical suggestions were provided.

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CHAPTER 1

INTRODUCTION

Background and Rationale

Peer revision as an aid to writing in the second language (L2) classroom has been amply discussed in the past decades. Supported by the process writing approach (e.g., Emig, 1971), collaborative learning theory (e.g., Bruffee, 1984), and sociocultural theory (e.g., Vygotsky, 1978), L2 writing instructors and researchers have no longer regarded teachers as the only authority and sources of feedback for students' writing. Instead, L2 writers now are encouraged to write via communication: they write and revise based on peers' critical comments received during reviewing sessions. Moreover, proponents have explicitly pointed out the advantages of peer revision in offering more informative responses than teachers' comments; providing students with a larger audience than simply one teacher; enhancing students' motivation with a more supported atmosphere; helping students learn more about writing and revision by having to read each other's drafts critically (Chaudron, 1984). In this sense, peer revising activities, in which learners exchange oral or written comments in order to mutually refine or revise writing skills or ideas, have gained increasing popularity in a process-oriented writing classroom.

However, among those scholars exploring peer revision in a cognitive fashion are few indicating the need to look into its sociocultural dimensions. For Vygotsky (1978), it is the individuals' milieu that all cognitive functions firstly originate from; only by constantly receiving and appropriating scaffolding provided by experts can novices gradually internalize linguistic knowledge and finally complete language learning tasks without any external assistance.

In such a Vygotskian perspective (1978), numerous researchers (Barnes, 1976; Cazden,

1988) have thus contended that language use and learning are socially constructed in nature. Revision, in this sense, is supposed to be perceived as actions encompassing both cognitive and social aspects of language learning. Moreover, it is also believed that the internalization from the inter- to intra-mental plane is a process of qualitative change and reconstruction in which novices and experts collaborate in creating a mutual activity frame, called zone of proximal development (ZPD) (Aljaafreh & Lantolf, 1994; Vygotsky, 1978). Based on the notions above, scholars have started to take a sociocultural stance on the issue of L2 revision. For example, some researchers have dedicated themselves to the analysis of different scaffolding actions existing in expert-novice interaction (e.g., Bruner, 1978; Villamil & de Guerrero, 1996; Wood, et al., 1976). Other researchers have investigated the mechanism of effective, successful expert-novice scaffolding (e.g., Aljaafreh & Lantolf, 1994; Lantolf & Aljaafreh, 1996; Nassaji & Swain, 2000; Rogoff & Wertsch, 1984).

While recent research has shed light on the sociocultural dimensions of expert-novice interaction, some researchers have sought to broaden their scope to investigate interaction beyond experts and novices, that is, the interaction between peers. By observing scaffolding behaviors imbedded in peer interaction, Wells (1998) suggested that the concept of scaffolding should not be limited to the less skillful or knowledgeable, but should be expanded to all participants. Other scholars (e.g., Swain & Laplin, 1998; Villamil & de Guerrero, 1998) also argued that the assistance provided between non-experts may result in positive learning as well.

Advocates of L2 revision, in this case, began to shift their attention to the potentially positive influences of peer scaffolding on L2 learners' writing outcomes. For instance, Villamil and de Guerrero (1998) pioneered to explore the impact of peer scaffolding on L2 writing revision. By comparing students' first and final drafts, they found a considerable percentage of modifications (74 percents) in students' final versions resulting from peers' scaffolding discourses, or more precisely, peers' mutual critical comments. Also, they noted

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learners' autonomous behaviors of revising their own compositions alone after the revision

sessions, considering such a self-regulated behavior to be an evidence of learning

achievements and internalization after series of peer interaction.

Among the abovementioned studies are even fewer that explore peer interaction via

on-line media. With the emergence of sophisticated technology that breaks the confinement

of time and space, peer interaction via on-line medium has inevitably become one of the

crucial channels for L2 teaching and learning. Several researchers have indeed pointed out

the merits of on-line peer scaffolding for L2 acquisition. For example, Cononelos and Oliva

(1993) noted that peer scaffolding embedded in on-line interaction supported an ongoing

conversation to develop among many participants and hence created a learner-oriented

environment where students may co-create texts which were authentically interesting. This

learner-centered interaction, according to Kern (1995) and Warschauer (1996), is the key

factor that helps enhance students' motivation for participation. However, it should be noted

that such studies as the above have merely delineated the effects of electronic peer interaction;

they, nevertheless, have not looked into the core of on-line peer interaction, that is, the

elements constituting on-line peer interaction, the relationships among the elements, and their

influences on individuals' language learning.

Purposes of the Study

To gain a deeper understanding of electronic peer interaction, this study employed

Vygotskian sociocultural theory as the theoretical framework to probe the nature of peer

revision via on-line medium. Specifically, the study is threefold. First, it explored the types of

interaction occurring between members of a dyad engaged in on-line L2 peer revision.

Second, it examined the kinds of social relationships resulting from learners' cognitive stages

of regulation. Third, it investigated the relationships between L2 learners' cognitive status

and their received scaffolding.

Based on the rationales above, this present study attempted to address the following three research questions:

(1) What types of interaction occur between members of a dyad engaged in on-line L2 peer revision?

(2) What kinds of social relationships emerged from the participants' cognitive stages of regulation?

(3) What is the relationship between the participants' regulatory levels and their received scaffolding?

Organization of the Thesis

In addition to Chapter 1, this thesis consists of four chapters. In Chapter 2, I review the literature of peer revision, sociocultural theory, and computer-mediated communication, all of which bring out the necessity to investigate on-line peer revision from a sociocultural perspective. In Chapter 3, I put forward the detailed study method, inclusive of the information of the setting, participants, procedure, and data collection as well as analysis. In Chapter 4, I present the results in response to the three research questions. Chapter 5, as the final chapter, concludes the thesis by displaying the discussion and the summary of the study findings, the limitations of the study, pedagogical implications of this study, and suggestion for future research.

CHAPTER 2

LITERATURE REVIEW

This present study aims to use Vygotskian sociocultural theory to examine L2 on-line peer revision activities. In order to acquire a general picture of the study, the literature review addresses three main themes: peer revision, sociocultural theory, and computer-mediated communication.

Peer Revision

In the field of second language (L2) writing, evaluation of students' final writing products was always the primary task and prerogative of teachers in the past (Rothschild & Klingenberg, 1990). The unique benefits learners themselves could provide each other, in this case, were seriously deprived. Over the last decades, however, such a failure of recognizing the potential of learners as writing teachers or tutors has given rise to a process-oriented writing approach (Liu & Hansen, 2002). Hairston (1982) outlined the process writing approach as follows:

> It [Peer revision] focuses on writing as a process, with instruction aimed at intervening in that process; it teaches strategies for intervention and discovery; it emphasizes rhetorical principles of audience, purpose, and occasion, with evaluation based on how well a given piece meets its audience's needs; it treats the activities of prewriting, writing, and revision as intertwining, recursive processes; and it is holistic, involving nonrational, intuitive faculties as well as reason. (p. 86)

As Hairston stated, the process writing approach does not follow the old-fashioned reductionist view that writing is merely an accumulation of pre-formulated ideas. Rather, it characterizes writing as a "dynamic, nonlinear, and recursive" (Liu & Hansen, 2002, p. 3) procedure containing steps of pre-writing, drafting, revising, and post-writing. Also, its

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feature on the paradigm shift from writing as a silent and solitary activity to writing as a collaborative process has underscored not only the importance of social exchanges which has long been neglected in traditional writing instruction but also the necessity of establishing "a supportive environment in which students are acknowledged as writers, encouraged to take risks, and engaged in creating meaning" (Zamel, 1987, p. 697).

Revision, one of the steps at which student writers revise their own drafts according to the responses received from instructors, peers, or even themselves, has been identified as the most crucial factor in achieving high quality in their final product (Bereiter & Scardamalia, 1987; Elbow, 1981; Sommers, 1980; Zamel, 1983). Peer revision, in particular, is a frequently used technique that allows for "the intervention of other students as audience and collaborators" (Villamil & de Guerrero, 1996, p. 52). Such a collaborative manner, featured by mutual respect among peers for free meaning negotiation and seeing texts through each other's eyes, has been indicated to be more productive than authoritative and prescriptive attitudes (de Guerrero & Villamil, 1994; Lockhart & Ng, 1995; Mangelsdorf & Schlumberger, 1992; McGroarty & Zhu, 1997; Nelson & Murphy, 1993).

Proponents of peer revision in the first language (L1) settings have argued that while teachers tend to appropriate students' writings in the way of "confusing the student's purpose in writing and the instructor's purpose in commenting" (Sommers, 1982, p. 149) and of "usurping the students' rights to their writings" (Brannon & Knoblauch, 1982, p. 157), peers may play a more immediate and socially appropriate role in offering compelling impetus for student writers to revise (Clifford, 1981). Moreover, active and spontaneous interactions among peers have also been observed to force novices to try out, to work with unrehearsed language, and to be involved in "exploratory talk" (Barnes, 1976, p. 200). Such an exploratory talk, termed "discourse as catalyst" by Cazden (1988), indeed helps students not only reconceptualize their ideas but also establish didactic relationships with their audiences. Additionally, these cognitive and social benefits are also claimed to support "forms of

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learning which take place less readily in full class" (Barnes, 1976, p. 200).

The process writing approach and its highlights on peer revision have influenced L2 educators and researchers who regard L1 and L2 writing identical or, at least, very similar. In particular, Edelsky (1982) stressed that the process writing approach could both be operated in L1 and L2 writing classrooms, due to the "general process universals" (p. 227) shared among languages. Arapoff (1969) contended that foreign students should be encouraged to write via such a discovery and transformation process, especially when it had been proven to be beneficial for native speakers. In view of these general beliefs in the parallelism between L1 and L2 writing processes, there is no surprise that the merits of peer revision have been widely acknowledged in L2 instructional settings (Kroll, 1991; Leki, 1990; Mangelsdorf, 1989; Mangelsdorf & Schumerger, 1992; Mittan, 1989; Zamel, 1985).

For example, in terms of cognitive advantages, Mangelsdorf (1989) advocated that peer negotiation in revision sessions benefited L2 students in integrating language skills of four dimensions (listening, speaking, reading, and writing) and thus helped develop their general L2 competence. Also, she indicated that the attempts of students to test out and examine their hypotheses about L2 in authentic revision settings were critical for successful second language acquisition (SLA). Following Mangelsdorf, Liu and Hansen (2002) asserted that peer revision facilitated "reading-writing connections" (p. 3) since it united "content, linguistic, and rhetorical schemata through multiple exposures to a text" (p. 3).

In addition to cognitive benefits, peer revision has also been proven to bear various affective advantages. Mittan (1989) observed that since student writers received authentic comments from readers, they gained a clearer understanding of their current performance and a higher motivation to continue their writings. Moreover, as Leki (1990) indicated, through observing others' weaknesses and strengths in peer response activities, students would stand a better chance to develop self-confidence and reduce apprehension. Liu and Hansen (2002) further pointed out the potential of peer revision to establish collegial tie among students and

its capability of offering a more comfortable and secure learning environment for those who may easily feel isolated and misunderstood.

Studies on Efficacy of Peer Revision

In spite of the abovementioned benefits, writing instructors and researchers still show reservations about the efficacy of peer revision. This uncertainty mainly springs from the concern that students may not be sophisticated and objective enough to judge writings, nor do they have enough linguistic knowledge to detect and revise weaknesses in need of revision (Jacobs, 1989). In order to examine the effectiveness of peer revision, Nelson and Murphy (1992b) explored whether L2 language learners and instructors could detect similar areas needed to be revised in drafts. The results revealed that half of the L2 students and instructors indeed identified the same areas for revision.

Moreover, findings of other studies (e. g., Berg, 1999; Hedgcock & Lefkowitz, 1992; Lockhart & Ng, 1995; Mendonca & Johnson, 1994; Stanley, 1992; Villamil & de Guerrero, 1998) have also revealed that students, especially those who have received training on peer review, actually are able to give specific comments or to point out problems with content and rhetoric. In fact, peers may even provide better content feedback than teachers if they are paired up according to their individual specialties (Belcher, 1990). Furthermore, peer response has also been found to stimulate and instigate further revision after the end of reviewing activities, indicating that students would keep considering and expanding peer comments when revising their drafts on their own (Paulus, 1999; Villamil & de Guerrero, 1998).

Another way to examine the efficacy of peer revision is to observe if students truly implement peers' suggestion in their final drafts. To this question, however, there is no definite answer. Some researchers (e.g., Connor & Asenavage, 1994; Zhang, 1995) found only a small percentage of peer comments incorporated in final writing. For instance, by

comparing the changes eight L2 students made in their compositions and the actual feedback they received, Connor and Asenavage (1994) found only 5% of the total revisions resulted from peer comments, while 35% resulted from teachers' comments and 60% from others (e.g., tutors) or themselves. Similarly, Zhang (1995) also found that a high percentage (76 out of 81) of college freshmen chose teacher feedback when being asked to state their preference among teacher, peer, and self-feedback. Based on the findings of these researches, teacher comments were seemingly more effective, or at least more favorable, than peer comments.

Such inconsistency between multiple benefits of peer feedback reported and the surprisingly low ratio of being utilized and favored by students has called for further study. Several researchers (e.g., Jacobs, Curtis, Braine, & Huang, 1998; Nelson & Carson, 1998) have claimed that this conflict might result from misused or inappropriate research methods. For example, Jacobs et al. (1998) argued that studies that forced students to make decisions between peer and teacher comments were misguided, since peer and teacher comments should not be mutually exclusive. Their questionnaire survey of 121 L2 undergraduates showed that 93 percent of the students preferred to have peer feedback as one type of feedback for their writing, suggesting students' general positive attitudes toward both peer and teacher comments when they are not forced to make a choice.

Moreover, Nelson and Carson (1998) contended that the expected effectiveness of peer revision would be seriously cut down due to learners' selective manner when acquiring too many options for obtaining feedback. Liu and Sadler (2003) also indicated that language learners indeed had the capability to tell that "peer feedback seemed to be more focused on specific concerns, whereas teacher feedback was more global" (p. 195). In addition to those critiques on improper research designs, other scholars (e.g., Min, 2005, 2006; Stanley, 1992; Zhu, 1995) proposed another pedagogical factor that might also influence the effectiveness of peer revision, that is, whether students receive appropriate peer revision training.

According to Min (2006), students, whether native or nonnative, tend to give "rubber

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stamp advice" (p. 119) when reviewing peers' writing. This phenomenon is believed to result from students' inability to provide concrete and useful feedback (Chou, 1999; Leki, 1990; Lockhart & Ng, 1993; Mangelsdorf & Schlumberger, 1992; Mendonca & Johnson, 1994; Tsui & Ng, 2000). Being aware of this dilemma, researchers have conducted series of studies investigating if training on peer evaluation could enhance the quality of feedback. For instance, Stanley (1992) offered lengthy training for L2 freshmen to familiarize with the genre of their peers' writing and effective communicative techniques students might like to use in revision. Conversational analysis on peer feedback revealed the results of more responses and more types of responses in the coached groups. Moreover, subsequent analyses on the drafts also displayed a higher percentage of peer response incorporated in writing in the coached groups than in the uncoached groups. Following Stanley, Zhu (1995) further found that peer responders who received response training on reviewing tactics and on identifying possible writing troublesources indeed could provide feedback of higher quality and quantity. Moreover, Min (2005, 2006) indicated that proper peer revision training could help inexperienced student reviewers not only produce more comments concerning global issues, but also sense the incongruity between writers' intended meaning and the actual meaning perceived by readers. Based on these studies above, it is suggested that appropriate revision training may improve the effectiveness of peer revision in the way of enhancing the quality and quantity of peer response and of raising the ratio of incorporation in subsequent revision.

Limitations of Traditional Face-to-Face Peer Revision

Although peer revision has been theoretically supported by the process writing approach and proved to be one of the most crucial components in achieving writing quality, the traditional face-to-face (FTF) peer revision was still criticized in two aspects: its ignorance of the sociocultural context (Silva, 1990) and its potentially tense FTF medium (Liu, 2000; Liu

& Sadler, 2003; Nelson & Murphy, 1992a).

First, since language use and learning is considered to be a socially constructed process of collaboration, interaction, and communication (Barnes, 1976; Cazden, 1988; Vygotsky, 1978), peer revision-- the process in which peers construct meaning within the context of social interaction-- should be perceived as the action combining both cognitive and social aspects of language. Pitifully, the traditional line of study is solely focused on such cognitive issues as impact and effectiveness of peer revision, but neglects sociocultural dimensions of peer revision. In an effort to fill the gap, some researchers (e.g., DiPardo & Freedman, 1988) have asserted that Vygotskian sociocultural theory is indeed the one that provides an ideal access to examine the relationship between humans' talk and writing as well as to gain a better understanding of how social interactions contribute to writing development. Also, according to Villamil and de Guerrero (1996), the Vygotskian concept of "zone of proximal development" (ZPD) is exactly the key component that recognizes the significance of peer assistance in learning and thus applicable to explain collaborative activities occurring during peer revision. Based on such convictions, it is suggested that Vygotskian sociocultural theory could be a proper theoretical framework to analyze sociocultural interactions in on-line peer revision.

Second, traditional FTF peer revision has been criticized to make some students, especially those from Asia, feel uncomfortable due to its hostile atmosphere (Liu & Sadler, 2003; Nelson & Murphy, 1992a) and L2 students' insecurity toward classroom participation in the target culture (Liu, 2000). According to Nelson and Murphy (1992a), students might present sarcastic, overly critical, and unkind attitudes when reviewing the writing of their peer classmates. Such negative attitudes would consequently cause a sense of discomfort, uneasiness, and even defensiveness among peers (Amores, 1997). Moreover, the lack or immaturity of L2 formal schemata might also lead L2 readers to inappropriately or even mistakenly review the content or the structure of texts and finally cause the doubt of writers

about the validity of peer comments (Liu & Sadler, 2003).

For some researchers (e.g., Liu & Hansen, 2002; Liu & Sadler, 2003), such conflicts and imperfection existing in the FTF medium could be drastically resolved if students' drafts are revised via computer-mediated communication (CMC), due to its potential to enhance opportunities and motivation for authentic interaction and negotiation (Kern, 1995); reduce anxiety and improve self-confidence as well as linguistic proficiency (Beauvois & Eledge, 1996; Fanderclai, 1995); boost students' confidence in writing and improve the quantity of either teacher or peer feedback (Braine, 1997); help generate an overall greater number of comments, a higher percentage of revision oriented comments, and an overall greater number of revisions (Liu & Sadler, 2003).

This present study explores the sociocultural dimension of electronic L2 peer revision in the hope of expanding traditional cognitive views and grasping the essence of on-line peer interaction and collaboration. As two key ingredients in this research, the literature of sociocultural theory and computer mediated communication (CMC) will be reviewed in the following sections.

Sociocultural Theory

Sociocultural theory, which originated from the work of L. S. Vygotsky, is very different from theories currently in favor in the mainstream SLA literature. That is, it combines the social interaction with human cognition, considering individuals' cognitive thoughts and behaviors as the products of continuous social interaction, instead of the results of biological maturation. More specifically, within sociocultural theory, the concept of mediation plays a crucial role in the construct of activity and generation of higher mental processes.

As argued by Vygotsky (1987), while humans do not act directly on the physical world, they would rely on technical and psychological tools to change the world and mediate their relationships with others. These tools, whether physical or symbolic, are created and

modified by human cultures over time and are made available to succeeding generations, and therefore can "organize the properties of the natural, or biologically specified, brain into a higher, or culturally shaped, mind through the integration of symbolic artifacts into thinking" (Lantolf, 2000, p. 2). In other words, sociocultural theory opposes the orthodox, substantialist view that dichotomizes the mental and the social. It holds that human forms of mental activities arise in social interactions where other members of our culture and the experiences we construct with culture-specific artifacts would determine the ways we regulate our mental processes. In this sense, the intentional and voluntary control on our higher mental functioning (e.g., memory, attention, planning, rational thoughts, and problem solving) is mediated through historically-shaped artifacts, among which language – the "tool of tools" (Vygotsky, cited in Wells, 1994, p. 46) – is the basis of human intellect and thus is of the greatest significance (Vygotsky, 1978).

Given that any person's experience with the external world is mediated, Lantolf (1994) suggested that the zone of proximal development (ZPD) is the prerequisite for successful mediation. Aljaafreh and Lantolf (1994) continued to emphasize the value of zone of proximal development (ZPD) as a framework that "brings all of the pieces of the learning setting together – the teacher, the learner, their social and cultural history, their goals and motives, as well as the resources available to them, including those that are dialogically constructed together" (p. 468). On account of its close affiliation to successful mediation and its potency of uniting all educational phenomena, the concept of ZPD, as well as its three tightly related ideas – internalization, scaffolding, and regulation, will be discussed in detail in the following sections.

Zone of Proximal Development (ZPD)

As acknowledged, all higher mental processes of individuals are mediated through technical and psychological artifacts, which organize the properties of the biological brain

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into the higher, or culturally shaped, mind. In other words, all cognitive functions firstly originate from the society and later come to be internalized within the individual. This transfer from the social plane to the mental plane is clearly illustrated by Vygotsky (1978) as follows:

> Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (interpsychological), and then inside the child (intrapsychological). This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relations between human individuals. (p. 57)

Interpreting Vygotsky's words, Aljaafreh and Lantolf (1994) regarded this transition from inter- to intra-mental functioning as a process of qualitative change and reconstruction in which novices and experts may collaborate in constructing a mutual activity frame. This activity frame displaying the differences between what a person can do alone and what he or she can do with assistance is ZPD.

ZPD, defined as the distance between learners' actual developmental level and the level of potential development, is the site where social forms of mediation develop (Vygotsky, 1978). Specifically, the actual developmental level represents a result of certain already completed developmental cycles, whereas the level of potential development is the level at which individuals are able to complete tasks with assistance from, or in collaboration with, other more experienced experts (Aljaafreh & Lantolf, 1994).Thus, knowing an individual's unassisted performance is just knowing this person's history of development; only by knowing what individuals can achieve with assistance could we understand their potential development in the future. To emphasize again, ZPD is not a specific task embedded in interpersonal activities, but is a higher cognitive process emerging as a result of interactions (Lantolf & Appel, 1994).

Nevertheless, it should be noted that, for Vygotsky, the potential level of development is worth more attention than the actual one, since this level is more indicative of mental growth than actual development (Aljaafreh & Lantolf, 1994). That is, as a window into the future mental growth of individuals, the potential level of development defines the development "prospectively" (Vygotsky, 1978, p. 87), while the actual level only defines the development "retrospectively" (Vygotsky, 1978, p. 87). Hence, the proximal developmental range of an individual cannot be fully understood unless his/her upper boundary of the development is determined. From this perspective, the same IQ score of two individuals can only at best indicate their current actual developmental level, but cannot detect the potential developmental level they might achieve; one might have a high IQ but a small ZPD, while another has a low IQ but a large ZPD (Dunn & Lantolf, 1998). In reference to language learning, a novice language learner who is able to receive and respond to the assistance of an expert is assumed to have a larger ZPD and hence might reach a better and higher developmental position in a more rapid rate than another who fails to do so. In this sense, a learner who can appropriate and react to the materially- or socially-based help is supposed to stand at a more advanced position in second language learning.

Internalization

While learners move forward in their ZPD, they are believed to gradually get rid of external assistance and are able to solve problems with increasing autonomy and independence. Central to this transition from inter- to intra-mental functioning in the ZPD is the process of internalization, or more properly for sociocultural theory, "appropriation" (Newman, Griffin, & Cole, 1989, p. 64). According to Lantolf (2000), the concept of internalization is defined as "the process in which the novice learner moves from carrying out concrete actions with the assistance of objects and of other individuals to carrying out actions mentally without any external help is defined as internalization" (p. 14). In this view,

internalization can be perceived as the essential element for learners to reach a higher state of mental functioning in the ZPD (Kozulin, 1990). With regard to the language learning, the notion of internalization refers to the process in which language learners intend to "construct a mental representation of what was at one point physically present (acoustic or visual) in external form" (Lantolf, 2003, p. 351).

For Vygotsky (1987), imitation is fundamental to internalization. Noticeably, in opposition to the imitation in traditional behaviorist paradigms, the imitation occurring in the process of internalization is not simply a repetition (Lantolf, 2003). Rather, such imitation "transforms the process itself and changes its structure and functions" (Vygotsky, 1981, p. 163) and hence implies agency and intentionality. More specifically, while waves breaking on a beach and the earth orbiting around the Sun represent the repetition with no agency and intentionality (Thorne, cited in Lantolf, 2003), imitation in Vygotsky's sociocultural theory should be regarded as a qualitative transformation and understood as a goal-directed act through which human mental capacity could be formed in the transition from the external to the internal (Lantolf, 2003).

Aljaafreh and Lantolf (1994) further determined five general stages of internalization as learners move from reliance on the external assistance toward reliance on the self. These five levels are characterized in terms of three parameters: intervention, noticing an error, and correcting an error. That is, while learners at the first level represents those who are not able to notice and correct an error even with intervention from material artifacts or capable individuals, learners at the fifth level are those who consistently and automatically use correct target forms in all contexts. Through these five stages, learners are believed to imitate and appropriate the external assistance provided and gradually show increasing autonomy in detecting and correcting their own mistakes without outside feedback.

However, this movement that a novice language learner internalizes either materially- or socially-based assistance in order to reach his/her full potential in the ZPD can never be

considered as a uniform and linear development (Lantolf & Aljaafreah, 1996). Instead, this higher mental development is dynamic and irregular. Lantolf and Aljaafreah (1996) employed the microgenetic method to observe how this "wave-like curves" (Van der Veer & Valsiner, 1991, p. 309) are manifested on the parts of the linguistic features and the regulation negotiated between novices and experts. Results showed that L2 learners would not necessarily improve their performance or increase the needs for implicit help after each episode of interaction; they would sometimes backslide to previous stages at which more explicit cues would be needed for task completion.

Such "regressive phenomena" (Kozulin, 1990, p. 211) not only reject the traditional cognitive view that mental development is the result of the gradual accumulation of separate changes, but also have further proved L2 development to be a dialectic, spiral-shaped learning process. All in all, regression, or backsliding, should be considered to be a natural part of the language developmental process (Lantolf & Aljaafreah, 1996).

Scaffolding

Another concept central to the idea of ZPD is scaffolding. Vygotsky and Luria firstly used this metaphorical term "scaffold" to illustrate the way how adults introduce children to cultural means (de Guerrero & Villamil, 2000). Later, Bruner (1978) referred this to a mother's verbal efforts that maintain conversation with a child and indirectly promote language acquisition. He further classified the features of this mother's verbal scaffolding into five types: (a) reducing the complexity of the task, (b) getting the child's attention and keeping it focused, (c) offering models, (d) extending the scope of the immediate situation, and (e) providing support so that the child moves forward and does not slip back (cited in de Guerrero & Villamil, 2000). This mother's scaffolding behavior later has further been extended in educational psychology to refer to the assistance provided by experts for novice learners to solve problems. According to Wood, et al. (1976, cited in Anton, 1999, p. 305), the

scaffolding assistance provided by experts to adjust tasks that are originally above learners' ability to the level within their capacity can be characterized by six distinct functions:

1. Recruitment: enlisting the learner's interest in the task

2. Reduction in degree of freedom: simplifying the task

3. Direction maintenance: keeping the learner motivated and in pursuit of the goal

4. Marking critical features: highlighting certain relevant features and pointing out discrepancies between what has been produced and the ideal solution

5. Frustration control: reducing stress and frustration during problem solving

6. Demonstration: modeling an idealized form of the act to be performed by completing the act or explicating the learner's partial solution

As suggested by Wood, et al. (1976), these six scaffolding actions should be operated on an "implicit theory of the learner's acts" (p. 99). That is, the expert has to understand not only the way tasks or problems can be completed, but also the current competence and performance of the novice. In this sense, successful scaffolding greatly depends on the capabilities of the expert in realizing the task itself and the novice's demands as well (de Guerrero & Villamil, 2000).

In light of successful scaffolding, a great number of researchers (e.g., Aljaafreh & Lantolf, 1994; Lantolf & Aljaafreh, 1996; Nassaji & Swain, 2000; Rogoff & Wertsch, 1984) have investigated the mechanism of effective scaffolding. For example, Rogoff and Wertsch (1984) identified two principles for effective scaffolding intervention within the ZPD. First, intervention should be graduated. That is, the expert is supposed to provide the minimum level of guidance and the most implicit help at first in order to stimulate the novice to function at his or her potential level of ability. It is only when novices make the request for further help can the increasingly specific and concrete guidance be gradually offered. Second, the scaffolding given should be contingent. In other words, the assistance is offered only when needed and should be immediately withdrawn when the novice rejects the help or

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shows any sign of self-control and full problem-solving ability (Aljaafreh & Lantolf, 1994, 1996). In this sense, determining a novice's ZPD in order to offer effective scaffolding is a negotiated process, which can only be completed by dialogic interactions between experts and novices.

Based on the rules of gradualness and contingence, Aljaafreh and Lantolf (1994) further proposed a regulatory scale in which thirteen levels of scaffolding ranging from implicit to explicit were labeled. According to them, these thirteen degrees of assistance constitute a collaborative frame, based on which the expert could dialogically help the novice in a subtle, but significant, way. Following this line of research, Nassaji and Swain (2000) conducted a small-scale research, proving the assistance provided in learners' ZPD is indeed more effective than that provided randomly. In their study, two Korean students learning to write in English as their second language were respectively treated to receive random assistance and assistance within the ZPD. Results showed that the learner receiving help within the ZPD indeed outperformed those receiving randomly determined explicit and implicit assistance.

Peer Scaffolding

Though ZPD was originally assumed to involve only interaction between experts and novices, it now has been expanded. According to Wells (1998), the concept of ZPD should not simply apply to the less skillful or knowledgeable, but is supposed to include all participants engaged in activities. Supporting Wells' statement, several scholars (e.g., Ohta, 1995; Swain & Laplin, 1998; Villamil & de Guerrero, 1998) have indicated that assistance in collaborative interaction could equally be provided between non-experts, and learning therefore may emerge in the absence of experts.

For example, Swain and Lapkin (1998) observed the ways how middle-school French immersion students solved puzzle stories and found that the students had the tendency to generate talks when searching and assessing possible solutions to formal language problems.

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According to the reports of pre- and post-tests, they suggested that this joint problem-solving process resulted not only in the creation of knowledge but also in a higher level of internalization of each student. Moreover, Villamil and de Guerrero (1998) affirmed the positive effect of peer collaboration on writing revision, that is, a overwhelming percentage (74%) of peer comments received during peer discussion were later incorporated in the final drafts. Also, they noted learners' autonomous behaviors of revising their compositions alone after the revision sessions, suggesting students' progression from other-regulation to self-regulation. In addition, Ohta (1995), by comparing teacher-fronted and paired interaction, also observed such positive learning effects resulting from learner-learner collaborative activities where the ZPD emerged.

Another line of research (e.g., de Guerrero & Villamil, 2000; DiCamilla & Anton, 1997; Donato, 1994; Ohta, 2000; Villamil & de Guerrero, 1996) has devoted themselves to the investigation of peer scaffolding patterns. For instance, Donato (1994), by examining how L2 development occurred through a triadic planning task, proposed a general, but fluid, way in which peer scaffolding functioned. That is, language learners may at the same time be individual novices and collective experts, indicating the power of peers of a group acting as a collective to offer sources of new orientations and guide each other through complex linguistic tasks.

To further specify peer scaffolding patterns, Villamil and de Guerrero (1996) carried out a detailed microgenetic analysis to observe the strategies used by 54 English-as-a-second-language (ESL) students during peer revision sessions. They finally identified five types of scaffolding strategies: (a) use of symbols and external resources, (b) use of the L1, (c) scaffolding assistance, (d) deploying interlanguage knowledge, and (e) externalizing private speech. Based on this study, Villamil and de Guerrero (2000) continued to discover a mutual scaffolding mechanism by which strategies of revision took shape and developed in the interpsychological space: (a) recruiting the writer's interest and not letting it

flag throughout the interaction, (b) marking critical aspects or discrepancies in the writer's text, (c) explicitly instructing or giving minilessons to the writer on issues of grammar and mechanics, and (d) modeling appropriate forms for the writer.

Furthermore, Ohta (2000) advanced to explore if scaffolding occurring in students' ZPD was provided randomly. Findings revealed a negative answer to this hypothesis, that is, instead of being offered randomly, scaffolding appeared when peers bid for assistance either by explicitly asking for help or showing cues to indicate their readiness for assistance. Also, peers were observed to wait for their partners to improve their imperfect linguistic performance; the duration of waiting time would be different according to peers' mutual understanding as to when the partner was ready to produce appropriate utterances and when was not. These appropriate uses of cues and silence, according to Ohta (2000), implied not only learners' sensitiveness to each other's ZPD, but also a graduated and contingent pattern in which the scaffolding mechanism was constructed.

Regulation

Another concept tightly associated with the ZPD is regulation. According to Vygotsky (1978), children are initially subject to whatever object catches their attention, then gradually allow parents to dialogically influence their attention, and finally are able to control their own attention. Based on this pattern of children mental development, Lantolf and Appel (1994) proposed three kinds of regulation representative of three different cognitive stages: object-regulation, other-regulation, and self-regulation. Specifically, object-regulation refers to the stage when children are still dominated by the objects in the environment and their actions are limited to those which do not require decontextualized representation. Other-regulation refers to the phase when children are able to carry out actions with assistance of parents, caretakers, or more skilled others. Self-regulation refers to the level at which children have internalized certain strategies and therefore can independently perform

actions. These three kinds of regulation occurring in the ZPD constitute a transition in which children gradually gain autonomy over tasks through a dialogic process where adults make necessary adjustments to tasks and direct children to solve problems in an increasingly independent manner.

The definition of these three stages of regulation was further expanded by de Guerrero and Villamil (1994) in reference to different phases of language acquisition. That is, object-regulated language learners refer to novices who tend to be bound by a troublesource and easily distracted away from the task due to their inadequate and incomplete grasp of the goals and the lack of linguistic knowledge necessary to carry out tasks. Later, when learners enter the other-regulated phase, they would start to show distinctive capacities in identifying problems with others' assistance. That is, contrary to the object-regulated learners who fail to engage in constructive dialogue with others, other-regulated learners may involve themselves in a collaborative negotiation in which they are able to be guided and recognize a troublesource when pointed out. Last, when language learners finally reach the self-regulation stage, they would successfully internalize the task requirements and hence present their full capacity for problem-solving or even the willingness to provide other less-regulated members with scaffolding.

Based on the definitions above, de Guerrero and Villamil (1994) compared 54 ESL students' cognitive stages of regulation in the hope of realizing the social relationships in peer revision sessions. Findings revealed the existence of asymmetrical social relationships in peer revision. That is, student readers tended to assume control of revision tasks and thus were mostly self-regulated, whereas student writers contrarily tended to be other- or even object-regulated, indicating their great dependence on readers' comments. Moreover, the most common type of asymmetrical relationship was other-regulation vs. self-regulation. According the researchers, this was consistent with Vygotsky's idea that the most effective learning happens when more skilled peers assist less skilled ones in order to solve

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troublesources. Similarly, Young and Miller (2004) also explained how an ESL student and his partner cocreated a participation framework changing over time. By analyzing the interactional discourse in revision talk, they discovered that the less skilled student finally moved from peripheral to fuller participation while the more knowledgeable one moved in reverse in order for the partner to develop the self-regulation.

CMC Overview

Computer Mediated Communication (CMC) is defined as "the communication that takes place between human beings via the instrumentality of computers" (Herring, 1996, p. 1) or more precisely as "use of computer systems and networks for the transfer, storage, and retrieval of information among humans" (Santoro, cited in Salaberry, 1996, p. 17). All in all, CMC is the context where participatory or interactive communication takes place between two or more people, using different computers to write or listen to each other either synchronously (simultaneously) or asynchronously (not simultaneously) via the Internet.

As the latest developmental stage of computer-assisted language learning (CALL), CMC not only reflects the wide application of networked computers in the field of language learning and teaching but also represents a new era featured by sociocultural approaches to CALL (Kern & Warschauer, 2000). That is, while primitive mainframe computers and microcomputers limited language learners of the 1970s and 1980s in mechanic computational drills, networked computers have revolutionarily shifted the pedagogical dynamic to authentic human-to-human communication via the computer. In other words, language learners in this present period has no longer considered learning as an individual matter happening only in one's brain, but rather a socially constructed phenomenon instead. Moreover, computers now act as toolkits (Crook, 1994) – through the mediation of toolkits, learners have access not only to more abundant information and data, but also to meaningful interaction in authentic discourse communities.

According to Chapelle (2001), CMC actually had been put in practice since the 1960s, the time when users exchanged messages in both synchronous and asynchronous modes via a primitive mainframe computer. However, not until 1990s when the LAN and the Internet had finally expanded the scope of the network, did language researchers and instructors begin to put CMC into pedagogical uses for teaching collaborative L1 writing and providing practice in L2 (Chapelle, 2001). A number of researchers (e.g., Black, 2000; Garnsey & Garton, 1992; Swaffar, 1998) have pointed out the benefits of CMC. For example, Garnsey and Garton (1992) indicated that CMC offered a solution to the constraints posed by time and space on geographically dispersed organizations seeking to communicate with each other. Moreover, Swaffar (1998) reported social and affective benefits of CMC; it facilitated language classes by promoting learners' participation, enhancing their confidence, and boosting their greater enthusiasm in the communicative process than in oral classrooms. Further, Blake (2000) summarized the advantages of CMC reported in literature: (a) a text-based medium that amplifies students' attention to linguistic form, (b) a stimulus for increased written L2 production, (c) a less stressful environment for L2 practice, and (d) a more equitable and non-threatening forum for L2 discussion, especially those involving minorities.

On account of these abovementioned advantages, CMC has made its way into language education as a promising, innovative, and popular tool. In the following, we will focus on four distinct perspectives that make CMC unique on its own in the field of language learning and teaching: a). perspectives on comparison between CMC and face-to-face communication, b). linguistic perspectives on CMC, c). cross-cultural perspectives on CMC, and d). collaborative perspectives on CMC.

Perspectives on Comparison between CMC and Face-to-Face (FTF) Communication

Although few empirical studies had been conducted in earlier times of the development of CMC, futuristic and utopian speculation still far outstripped factual information (Herring,

1996). The need for descriptive and empirical research on computer-mediated interaction thus has driven scholars to compare learning outcomes acquired in CMC and FTF classrooms. Among these studies are two main areas that are the most salient: the quantity and quality of language production (e.g., Beauvois, 1998a; Chun, 1994; Gonzalez-Bueno, 1998; Kern, 1995; Schultz, 2000; Warschauer, 1996), and the equality of participation (e.g., Beauvois, 1998b; Huff & King, 1988; Kern, 1995; McGuire, Kiesler, & Siegel, 1987; Sproull & Kiesler, 1991; Warschauer, 1996).

The research focusing on the differences in language production between CMC and FTF communication is diversified in terms of different modes of the interaction. On one hand, parts of the scholars (e.g., Chun, 1994; Kern, 1995; Warschauer, 1996) aimed to compare discourses of FTF and synchronous CMC (e.g., *InterChange*). Chun (1994) examined electronic discourse logs of German students joining synchronous *InterChange* discussion and contended that learners in electronic discussions tended to interact directly with each other, as opposed to passively following a rigid pattern of teacher question, student reply, and teacher evaluation in traditional teacher-dominant classrooms. In other words, this positive student-centered interaction contributed to increased peer learning and decreased students' reliance on teachers. Moreover, learners were also observed to develop such sociolinguistic competence as greeting, requesting confirmation or clarification, and apologizing more easily through this real-time computer-mediated discussion.

Expanding Chun's (1994) study, Kern (1995) compared the quantity and quality of the discourse produced respectively in an *Interchange* session and a FTF oral discussion. Similarly, results showed that learners in *InterChange* sessions not only had a higher level of direct student-to-student interaction, but also produced a larger quantity of outputs. Also, students' discourse in *InterChange* was found to manifest an overall greater level of sophistication in terms of the range of morphosyntactic features and the variety of discourse functions.

Following this line of research, Warschauer (1996) conducted a counter-balanced, repeated measures study to compare the language students produced during FTF and synchronous *InterChange* discussions. Findings revealed that students in electronic discussions used more lexically and syntactically complex language than those used in FTF interaction. Moreover, the electronic discussion was found to include more formal expressions, which might be absent from FTF discussions. These findings above were also corroborated by Beauvois (1998a) and Gonzalez-Bueno (1998) in their similar comparisons.

On the other hand, the studies of Wang (1994) and Gonzalez-Bueno (1998) are best representative of those comparing asynchronous CMC and FTF interaction; they both examined the effectiveness of using E-mail as a tool to promote language learning by comparing dialogue journals written via E-mail and paper-and-pencil. Similar results showed that students using E-mail for their dialogue journals produced a greater amount of language with richer language functions and a more conversational tone than those in the paper-and-pencil group. Moreover, Gonzalez-Bueno (1998) also noted different time and space arrangements might result in different production of electronic dialogue journals, that is, students with terminals at home would feel more comfortable and hence produced more elaborated and longer messages containing greater variety of topics than those using public terminals and were pressed for time.

In addition to language production, researchers have also dedicated to compare the equality of participation in CMC and FTF. As suggested, instructors in traditional FTF learning tend to occupy a pivotal role, standing in front of seated students, allocating turns and directing questions, correction and clarifications; the relationship between learners and instructors, in this case, is asymmetrical. However, learners in CMC contrarily enjoy more opportunities to be involved in direct student-to-student interactions and take a more active role in discourse management as well as in topic construction and expansion (Chun, 1994; Kern, 1995). That is, such student-centered atmosphere in CMC would inherently attenuate

the power and authority of teachers, and finally equalize the status of learners and instructors (Kern 1995).

Moreover, according to Hiltz and Turoff (1978), this equalized effect may even be reinforced due to the lack of paralinguistic cues (e.g., intonation, tones, loudness, etc.) in CMC. That is, without the disturbance of these paralinguistic cues, learners could better concentrate on contents and factors such as ethnic, gender, personality, and moods of interlocutors may hence be neutralized. For instance, Sproull and Kiesler (1991) reported that all six studies they reviewed showed a higher degree of equality in CMC participation, but a relatively low level of equality in FTF discussion. McGuire, Kiesler, and Siegel (1987) found that women took the initiative as often as men in CMC discussion, but only one-fifth as often in FTF interaction. Huff and King (1988) observed that topics proposed by lower-status members would be more easily accepted in CMC discussion, but hardly accepted in FTF contexts. Chun (1994) and Gonzalez-Bueno (1998) noted that the alleged anonymity in CMC would help eliminate the fear and anxiety of making mistakes in public, stimulate shyer and quieter participants to be more "prolific" (Chun, 1994, p. 21), and thus enhance the equality of participation consequently. Also, Warschauer (1996) pointed out a strong correlation between students' participation and extra-linguistic factors (e.g., nationality, attitudes, and years of staying in target language countries), suggesting that students' wills for participation would be higher if paralinguistic factors could be removed.

Linguistic Perspective on CMC

Just as Johansson (1991) observed, electronic language has indeed brought with it new forms of discourse, which differ from traditional FTF language and thus has aroused serious discussion on the linguistic characteristics of CMC. Herring (1996) indicated that the language of CMC is typed and hence like writing, but it is exchanged rapidly and thus like spoken conversation as well. In other words, CMC language is neither spoken nor written in

terms of the conventional sense of speaking or writing. Spitzer (1986) quoted comments from his colleagues in which this new variety of literacy was described as "talking in writing" (p. 19) because participants in on-line panel discussions "must use language as if they were having conversation, yet their message must be written" (p. 19). In order to specify linguistic features that distinguish CMC from other modes of communication, several researchers (e.g., Collot & Belmore, 1996; Yates, 1996; Werry, 1996; Negretti, 1999) have examined not only heterogeneous CMC styles and genres but also CMC registers that have unique features of their own.

Collot and Belmore (1996), based on Biber's (1988) hypothesis that linguistic features co-occurring in CMC and other "textual dimensions" (Bibers, 1988, p. 3) may serve as indicators of particular communicative functions, conducted one typical corpus-based study in which the language used on Bulletin Board System (BBS) was compared with varieties of spoken and written English. Results showed that the language of BBS most resembled the genre of public interviews and letters, manifesting linguistic features lying between the extreme of speaking and of writing. Similarly, Yates (1996) conducted another large corpus-based study where Halliday's (1978) model was applied to compare the discourse of the spoken, written, and electronic mails (E-mail) with regards to the following three aspects: textual, interpersonal, and ideational. Findings revealed the complex nature of CMC; the textual function of language used in E-mails is more like written language in light of the vocabulary use, while the interpersonal dimension is otherwise more similar to spoken language with respect to the use of personal pronouns. Yates (1996) also asserted that some characteristics (e.g., the great use of modal auxiliaries) displayed in E-mail was actually shaped by social structural and situational factors and thus were beyond speaking and writing.

In addition, scholars also intended to discover paralinguistic or other linguistic correlated features that are unique to CMC. For instance, Werry (1996), by examining interactive written discourse generated via Internet Relay Chat (IRC), found that sentences of

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short length and abbreviated forms of language were created to accommodate limited screen sizes, slow typing speed, and less response time. He also found that complex sets of orthographic strategies designed to compensate the lack of paralinguistic and prosodic cues were employed for the effects of voice, gesture, and tone in CMC.

Similar findings were also reported by Negretti (1999), that is, interlocutors in Web-chat were found to utilize alternative communicative devices to convey the semantic load, which is usually carried by paralinguistic features in oral speech. Specifically, emoticons (e.g., : D and >__<) were utilized to substitute for visual cues in order to express particular meanings and attitudes toward the content of the message. Onomatopoetic devices (e.g., "Oh!", "Ah!", "Oh, hey!", and "zzz…zzz…"), representing aural cues in face-to-face interaction, served the function of conveying feelings and shades of meanings. Moreover, punctuation (e.g., question, commas, dots, and exclamation marks) functioned in many ways including indicating prosody and intonation contours and presenting semantic shades and implicatures.

Overall, Metz (1992) categorized emoticons into four forms: (1) those for verbalizing physical cues (e.g., hehehe), (2) those for describing physical actions (e.g., *hug* and *kiss*), (3) those for emphasis (e.g., "no, I *won't* go."), and (4) shorthand forms for physical condition (e.g., :-D for a smiling face). Such uses of emoticons, as well as capitalized words (e.g., "HELLO!") for expressing screaming and repetition of letters (e.g., veeeeeeeeery) for emphasis, have all been observed to help learners develop conversation-like languages which they might fail to acquire in actual FTF classrooms due to the shyness or fear of making mistakes (Gonzalez-Bueno, 1998; Maynor, 1994; Negretti, 1999; Werry, 1996). However, it is also necessary to note that such potentially less accurate and simplified linguistic features might disappear in asynchronous CMC contexts, since individuals could take their time to consult references and edit their messages before sending out when using asynchronous communicative tools (Gonzalez-Bueno, 1998).

Cross-cultural Perspectives on CMC

Another perspective that scholars concern about is whether CMC facilitates intercultural learning and appreciation. At earlier stages of the development, CMC was once passively considered as a weak medium that might cause awkwardness or difficulty in communication, due to its lack of nonverbal cues (Hiltz, 1986; Ma, 1996; Sproull & Kiesler, 1986; Rice & Case, 1983). For instance, Sproull and Kiesler (1986) indicated that CMC lacks social context cues which are originally transmitted through physical environments, nonverbal behaviors, and individuals' social status. Rice and Case (1983) claimed that such a "cue-filtered-out" feature makes CMC only "appropriate for the kinds of tasks requiring less social interaction and social intimacy" (p. 137). Overall, CMC was regarded as being more impersonal than FTF communication, and thus might hinder inter-personal communication (Walther, cited in Herring, 1996).

However, recent studies on relational communication have overthrown such assumptions above. They argued that the paucity of nonverbal cues in CMC could actually be compensated by alternative relational cues transmitted either through "electronic paralanguage" (Gumpert, 1990, p. 151) or verbal messages (Rice & Love, 1987; Walther & Burgoon, 1992). Moreover, the potential of CMC to create a strong equalized effect and to offer a solution to the constraints posed by time and space may also foster interpersonal, or even inter-cultural, communication. In this sense, CMC indeed has the potential to connect campuses in different countries, and provide learners opportunities to communicate with their culturally dissimilar counterparts.

Ma (1996) reported the findings of a study in which twenty U.S. students and East Asia students communicated with each other via IRC. That is, students in both cultural groups displayed a higher level of directness and self-disclosure in relay conversations and thus more easily reached a consensus and showed mutual understanding to each other's cultures. Similarly, Meagher and Castanos (1996) reported the way how an electronically mediated

exchange program affected the attitudes of 26 Mexican students towards their own and other cultures. Results showed that these students experienced a struggling confrontation between ideas, values, and attitudes when joining cultural exchange via CMC. However, such a confrontation between the new and the old did not overwhelm the students, but eventually motivated them to use their newly acquired knowledge to analyze new cultures and develop a wider perspective on their own traditional culture.

In addition to these two studies above, Sanaoui and Lapkin (1992) and Warschauer and Lepeintre (1997) all noted that language learners may gain higher tolerance and increased language practices via electronic cross-cultural communication, suggesting the high value of CMC in fostering inter-cultural appreciation and facilitating foreign or second language courses.

Collaborative Perspectives on CMC

As a way breaking down the traditional barriers of power and authority, CMC engages both teachers and learners "in fluid and ever changing roles (tutor, co-learner, researcher, negotiator etc.), where content, pace, practice, resource utilization, place, process and product are all open to negotiation" (Shield, Davies, & Weininger, 2000, p. 35). In this sense, learner autonomy either for critical reflection or collaborative negotiation has increasingly been emphasized and favored. Such a learning shift from the teacher-dominant model to teacher-orchestrated, student-centered model has served as a catalyst for the emergence of computer-mediated collaborative learning in which technology tools serve to cue, stimulate, and act the role as "object to think with" (Winograd & Flores, 1988).

Meskill and Ranglova (2000) explored the impact of sociocollaborative language learning by utilizing several technological tools (e.g., concordancing, Word processing, and E-mail) to integrate a literature-based curriculum in Bulgaria. Findings revealed significant achievements in not only students' improved scores on the part of reading and vocabulary but

also their new ways of using and thinking about language. Additionally, the students became more confident in themselves as active users of English and as knowledge co-constructors through series of collaborative computer-supported activities. Teachers, in this case, were brought out of the traditional role of single knower and into the position where both students and instructors enjoyed the equality in expressing personal or collaborative understandings of the literature.

Similarly, Warschauer (1998) also reported that MOOs (Multiuser-domain Object Oriented, text-based virtual reality environments), as one kind of CMC tools, offered great potential for collaborative scaffolding of shared knowledge in the construction of new ideas. Moreover, Freiermuth (2002) contended that the place-independent e-collaboration could provide "a comfort zone of communication" (p. 39) in that it prevented students from making spoken errors in front of their peers. Also, he observed that Internet chat containing "actual give-and-take of real conversation" (p. 38) could engage student participants in mutual task resolution and collaborative negotiation. Furthermore, Zahner, Fauverge, and Wong (2000) found that peer-to-peer support provided throughout the on-line collaborative work could assist students to reach a consensus of what constituted the task, plan a series of stages to approach the task objectives, and support each other in the accomplishment of the task.

Additionally, such CMC tools, especially synchronous ones, were also found to support students' argumentation, with this condition showing "more on-topic dialogue, more justification for their positions, better use of evidence, and the exploration of alternative points of view" (McAlister, Ravenscroft, & Scanlon, 2004, p. 202). Based on these favorable findings, there is no doubt that CMC has been credited as "the dominant use of technology in education" (Dillenbourg, 2003, p. 9).

Conclusion

In this chapter, I have firstly reviewed the rationale of peer revision. As shown in the

discussion above, traditional FTF peer revision, though popular, has been criticized for its ignorance of the sociocultural context (Silva, 1990) and its potentially tense FTF medium (Liu, 2000; Liu & Sadler, 2003; Nelson & Murphy, 1992a). As a research that attempts to fill the gap, the literature of Vygotsky's sociocultural theory (SCT) and of computer-mediated communication (CMC) are continued to be reviewed in the second and third sections above. All in all, with the review of the literature on peer revision, SCT, and CMC, this chapter intends to offer the theoretical framework of the present study – the sociocultural dimension of on-line L2 peer revision.

CHAPTER 3

METHOD

The purpose of this study is threefold. First, I explored the types of dyadic interaction in on-line L2 peer revision. Second, I examined the kinds of social relationships resulting from learners' cognitive stages of regulation. Third, I investigated the relationships between L2 learners' cognitive status and their received scaffolding.

To acquire a clear picture of this study, I present the setting, participants, procedure, and data collection as well as analysis in the following sections.

Setting

This study targeted 30 students enrolling in an 18-week, college-level English writing course at a public university in Taiwan. This course was designed to use a process-oriented approach to teach writing with the textbook *Developing Composition Skills: Rhetoric and Grammar* (Ruetten, 2003). The course objective was to help students familiarize with essential English writing concepts and the differences between writing for on-line communication and writing for formal or academic purposes. Based on this objective, the students in this course, on one hand, spontaneously exchanged opinions on the issues discussed in English via a certain electronic platform developed by the university. On the other hand, the students also revised their own writing based on the critical comments received either in (on-line or face-to-face) peer revision or in tutorial revision for the purpose of sharpening writing skills and developing composition ideas in a collaborative manner.

On-line Reviewing Environment – MSN Messenger

MSN, an acronym of Microsoft Network, is one of the popular instant messaging (IM) programs offered by Microsoft®. This IM system is accessible to news, e-mail, and a diverse

range of electronic databases, and is especially designed for the functions of text and voice conversations, web-cameras, and transferring files.

    MSN Messenger is featured by a contact list window and a conversation window. The contact list window is mainly segmented into two parts (see Figure 3.1). The upper part of the window shows a menu bar on which most of MSN Messenger's important elements (e.g., the user's nickname, preferences, E-Mail checker, etc.) are shown. The lower portion shows groups of contacts; once the user intends to start instant conversation with a certain contact, he/she simply has to double click the target presented, and then the conversation window would immediately pop out.

Menu Bar

The Contact List

Figure 3.1 The contact list window

    The conversation window can be roughly divided into three parts (see Figure 3.2). The left lower part of the window shows a rectangular area in which users may type their messages. The left upper portion of the screen serves as a virtual chat-room, where the discourses of real-time conversation would be listed in a chronological order. The right section shows the pictures representing the user himself/herself and the interlocutor. In addition, participants in the latest MSN Messenger can even click the buttons on the menu bar in order to enliven their messages with styled texts, emoticons, flash animations called

"winks", and animated display pictures. It should be noted that such contents of MSN chats, inclusive of the conversation discourse and the attempts of transferring files, could all be retrieved from the computers and hence are beneficial for our subsequent data analysis.
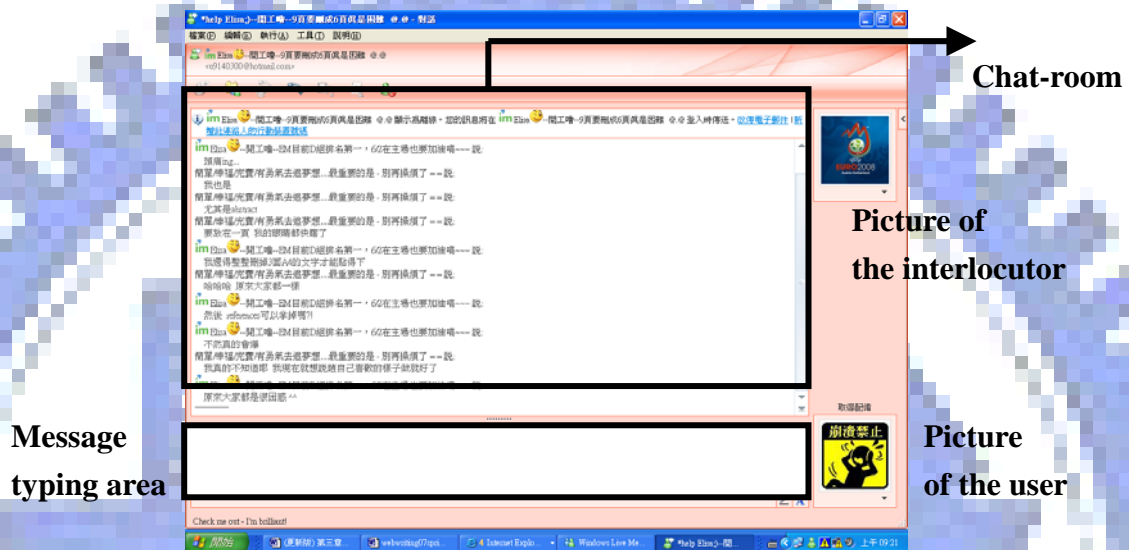
Figure 3.2 The conversation window

Participants

The study participants were 30 Taiwanese undergraduate students, including 17 males and 13 females, registering in an English writing course at a public university in Taiwan. Among these students, two were English majors while 28 were non-English majors. The participants were invited to participate in the study. They also signed the consent form for this study (See Appendix A) at the beginning of the semester. According to the background questionnaire (See Appendix B) adopted from Chien (2006), all of the participants owned personal computers with the Internet connection at home or in dormitories. Also, they were all equipped with the basic computational ability of using MSN for interpersonal communication. This suggests not only the participants' familiarity with synchronous modes of communication, but also their potentially low level of anxiety and defensiveness if being requested to exchange reviewing comments or writing ideas via MSN.

In order to ensure the participants' competence of using English as the communication language, the students were also asked to self report their English proficiency in the background questionnaire. Most (67%) of the participants reported their high-intermediate level of English proficiency in terms of General English Proficiency Test (GEPT)[1]. According to the level description, the examinees who pass the high-intermediate level have a generally effective command of English; they are able to handle a broad range of topics, and the mistakes they occasionally make would not hinder their communication. Aside from the 4 individuals who had never taken any kind of English proficiency test, the rest (20%) of the participants all reported their intermediate level, suggesting their proficiency of using basic English to communicate about topics in daily life.

Procedure

Adopting process writing as the major instructional approach, each writing task followed a modified "writing cycle" (Tsui & Ng, 2000). The whole cycle was sequenced as follows (see Figure 3.3): announcement of the writing topics, writing the first draft, training on peer revision (only in the first writing cycle), peer revision in either on-line or face-to-face mode, optional on-line tutorial revision, writing the second draft according to the reviewing feedback, and the submission of the final draft.

The study targeted three writing cycles in the data collection semester. In each writing cycle, the participants were first informed of one writing topic. After completing their writing pieces, they joined the subsequent reviewing and revising activities. However, it should be noticed that the students could freely choose to participate in either the computer-mediated or the face-to-face peer revisions. In this sense, through the three writing cycles, a total of 20

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[1] General English Proficiency Test (GEPT) is developed by Language Training and Testing Center (LTTC) under the support of the Ministry of Education, Taiwan. The purpose of the test is to provide a fair, valid, and reliable gauge for each level of ability in English. More detailed information for GEPT can be accessed via the following link: http://www.lttc.ntu.edu.tw/E_LTTC/gept_eng_main.htm.

pairs of the participants had the records of, for at least one time, reviewing and revising writing via on-line instant communication.

```
┌─────────────────────────────────────────────────┐
│        Announcement of the writing topics        │
└─────────────────────────────────────────────────┘
                        ▽
┌─────────────────────────────────────────────────┐
│       Write the first draft with word processing │
└─────────────────────────────────────────────────┘
                        ▽
┌─────────────────────────────────────────────────┐
│          Receive training on peer revision       │
│          (only in the first writing cycle)       │
└─────────────────────────────────────────────────┘

┌──────────────────┐              ┌──────────────────┐
│   Peer revision  │              │   Peer revision  │
│ via MSN Messenger│              │in a face-to-face │
│                  │              │     context      │
└──────────────────┘              └──────────────────┘

              ┌──────────────────────┐
              │ On-line revision     │
              │ tutorial (Optional)  │
              └──────────────────────┘

              ┌──────────────────────┐
              │  Submit the final    │
              │        draft         │
              └──────────────────────┘
```
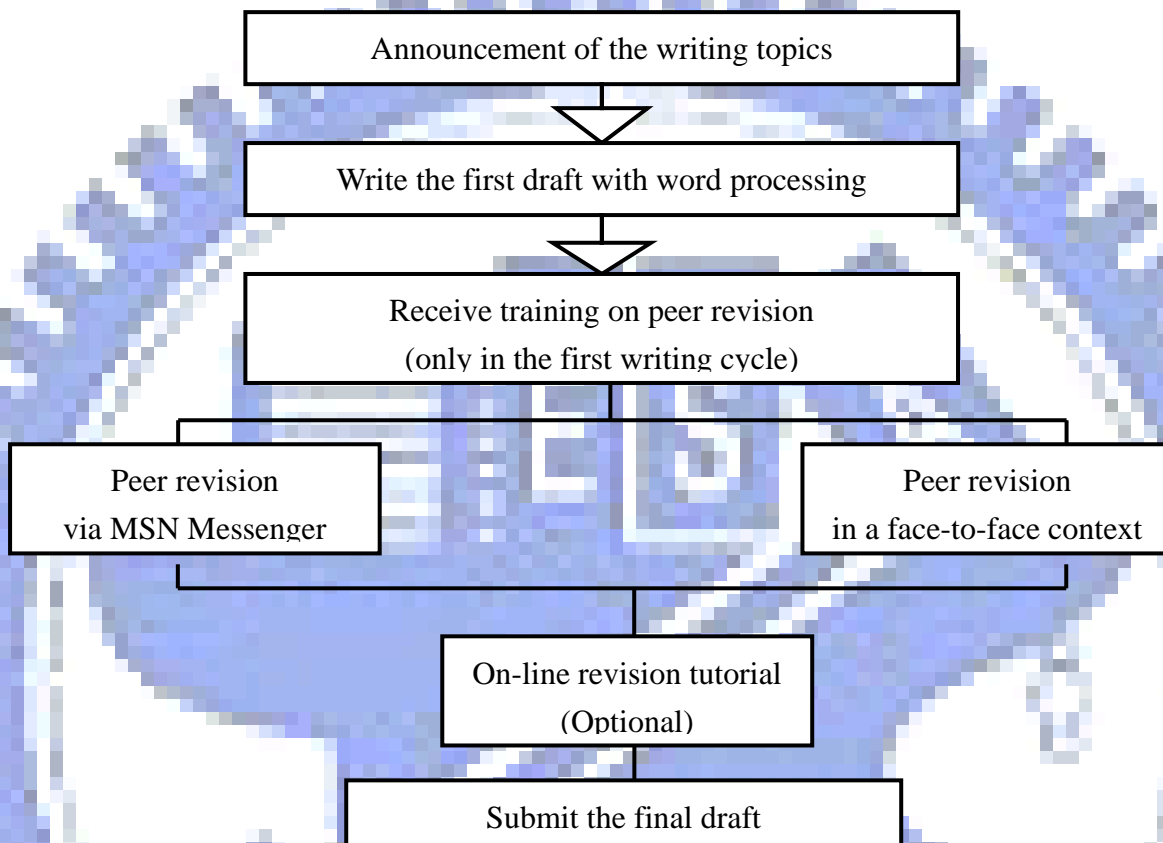
Figure 3.3 The writing cycle

Moreover, given that several researchers have pointed out the inability of L2 students to provide concrete and useful responses, one particular class before the first revision session was therefore designed for revision training and background information report in order to ensure the participants' competence of reviewing and revising in English (Chou, 1999; Leki, 1990; Lockhart & Ng, 1993; Mangelsdorf & Schlumberger, 1992; Mendonça & Johnson, 1994; Tsui & Ng, 2000). In the revision training, the strengths of process writing and of on-line peer revision were firstly explained. Then, peer editing sheets (See Appendix C) acting as a consciousness raising tool were distributed to help students perceive potential

troublesources (e.g., subject-verb agreement, tense, verb forms, and pronouns) appearing in essays.

After on-line peer revision, the participants were expected to revise their own English writing according to their received comments. Finally, this revised version of compositions were submitted a week later via a web-based platform.

The Pilot Study

One pilot study was conducted in the fall semester of 2006 to examine four pairs of non-English majors joining on-line revision via a synchronous CMC tool in a college-level English writing course in Taiwan. This pilot research assured the applicability and validity of de Guerrero and Villamil (1994)'s coding scheme, which were originally used to explore six different kinds of peer interactions embedded face-to-face peer revision sessions. This coding scheme included the following six categories: "Reader/Writer Interactive Revisions", "Reader Noninteractive Revisions", "Writer Noninteractive Revisions", "Reader/Teacher Interactive Revisions", "Writer/Teacher Interactive Revisions", and "Writer's Self-Response during Initial Reading Aloud".

The results revealed two possible differences between face-to-face revision and on-line real-time revision. First, the tradition of asking students to read texts aloud in face-to-face contexts could not be maintained in electronic revision sessions. Second, the on-line real-time revision offered the writers and reviewers a broader array of objects to consult with. In this sense, while students in face-to-face revision might regard the teacher as the sole expert and source of assistance, the students in electronic revision would seek for support and help from multiple on-line sources (including on-line dictionaries, on-line reference books, and others). Based on these two major findings, I eventually modified the coding scheme for identifying types of on-task episodes in on-line revisions. That is, the item of "*Writer's Self-Response during Initial Reading Aloud*" was removed since the participants in on-line revision would

not read texts aloud to each other. Moreover, the item of *"Reader/Teacher Interactive Revisions"* and *"Writer/Teacher Interactive Revisions"* were eventually replaced with *"Reader/Expert Interactive Revisions"* and *"Writer/Expert Interactive Revisions"*, because the term "expert" was assumed to better present a wider range of objects consulted by the participants during electronic revisions. This modified coding scheme were further adapted and employed in the main study and therefore will be explained in detail in the following coding scheme sections.

Data Collection and Analysis

In this study, the data were collected from the participants' instant communication logs. Two approaches were used to ensure the reliability and validity of the study. First, we applied an iterative process of classification and identification. Specifically, electronic discourse transcripts were coded by two raters. In order to have an initial grasp of category identification, 10% of the transcripts were first coded jointly by two raters with discrepancies solved by agreement. Next, the rest of the transcripts were coded and the disagreed results were discussed. Based on the degree to which both the raters gave consistency, the inter-rater reliability for the coding reached 80%. Second, a pilot study was conducted before the main study to examine the feasibility of the coding schemes. Then we modified the schemes based on the unique context of the main study. In the following, the coding schemes and analyzing procedures will be presented and explicated.

Coding Schemes

In order to answer the first research question -- "What types of interaction occur between members of a dyad engaged in on-line peer revision?", the researcher firstly used the coding scheme of de Guerrero and Villamil (1994) to iteratively categorize peer interaction logs into three types of episodes: on-, about-, and off-task. (See Table 3.1). For further details,

please refer to Appendix D.

Table 3.1

Types of Episodes

On-Task Episode	An utterance or group of utterances semantically related in topic or purposes to one discrete troublesource or a series of connected troublesources
About-Task Episode	A segment of conversation in which the participants talk about task procedures
Off-Task Episode	A unit of discourse in which the participants are not engaged in revising a troublesource

Next, the on-task episodes were further examined by the researcher in order to seek out the types of dyadic interaction embedded in on-line peer revision. Due to the differences between face-to-face revision and on-line revision perceived from the pilot study, the researcher employed the modified coding scheme, adopted from the version of de Guerrero and Villamil (1994), to code five different types of on-task episodes, that is, "Reader/Writer Interactive Revisions", "Reader Noninteractive Revisions", "Writer/Expert Interactive Revision", "Reader/Expert Interactive Revision", and "Writer Noninteractive Revisions".

Nevertheless, it should be noted that these five categories above still could not accommodate the reviewing situations in this study. Specifically, such a categorization could only delineate the interactions between two parties of subjects (e.g., Reader/Writer, Reader/Expert, and Writer/Expert). The interactions among three parties (e.g., Reader/Writer/Expert), in this case, would be inevitably excluded from the observation. In order to capture the full picture of on-line peer interaction, a new category, designated as "Reader/Writer/Expert Interactive Revisions", was thus created and included as the sixth interaction type in the coding scheme. This category is exemplified by Excerpt 3.1.

Excerpt 3.1 (Revision Session 2) (Reader: Henry; Writer: Tim)
1. Henry:　　首先 先看一下兩個單字 renounced 和 modest [Let's look at these two

words, "renounced" and "modest", at first.]

2. Henry:	我查奇摩字典之後 找不到比較適合的意思 [After checking Yahoo dictionary, I still cannot find appropriate meanings.]
3. Henry:	So 你可能要再確認他們的意思 [So, you may need to make sure their meanings again.]
4. Henry:	你找到了嗎？ [Have you found them?]
5. Tim:	恩恩 我可能用錯意思了 [Hmm. Hmm. Maybe I picked the wrong meanings.]
6. Henry:	a modest agrarian?
7. Henry:	中文意思是什麼阿？ [What is its Chinese meaning?]
8. Henry:	如果是祥和寧靜 可能用 peace 比較適當？ [If it refers to tranquility, is it more appropriate to use "peace"?]
9. Tim:	是喔… [Yes…]
10.Tim:	平靜的；安寧的…和平的；愛好和平的…我用字典查的 [not violent or disorderly…not disturbed by strife, turmoil, or war…I checked it up in the dictionary.]
11.Tim:	我本來是想說 一個淳樸的農業 [Originally, I meant simple, austere agriculture.]
12.Henry:	喔 淳樸 這我就想不出什麼字了 [Oh. Simple and austere. Well, then I have no idea.]

Note: Inside the square bracket [ ] is the English translation of the participants' Chinese nicknames and Chinese messages.

Excerpt 3.1 above represents the interaction developing beyond the reader and the writer. Specifically speaking, it exemplifies the interaction expanding among three parties of the subjects involved in this study, that is, the reader, the writer, and the expert.

At the beginning, the student reader (alias "Henry") brought up a series of questions (line 4, 6, 7, and 8) about the words of "renounced" and "modest" with the back-up of Yahoo on-line dictionary (line 1 and 2). To solve the doubts and defend himself, the writer (alias "Tim") later clarified his original thoughts by means of a hard-copy dictionary (line 10 and 11). It was edifying to note that the actions of consulting dictionary had expanded the interaction beyond the reader and the writer. In other words, the dictionaries, whether on-line or hard-copy, were the third party and served as a facilitator of peer revision that helped the

participants better focus their attention on specific troublesources and finally come up with possible solutions to the problems.

In short, the coding scheme for types of on-task episodes eventually included six different categories, that is, "Reader/Writer Interactive Revisions", "Reader Noninteractive Revisions", "Writer Noninteractive Revisions", "Reader/Expert Interactive Revisions", and "Writer/Expert Interactive Revisions". (See Table 3.2). For further details, please refer to Appendix E.

Table 3.2
Types of On-Task Episodes

Reader/Writer Interactive Revisions	Episodes in which both reader and writer discuss revision of a troublesource
Reader Noninteractive Revisions	Episodes in which the reader talks about how to revise a troublesource without the writer's intervention
Writer Noninteractive Revisions	Episodes in which the writer talks about how to revise a troublesource without the reader's intervention
Reader/Expert Interactive Revisions	Episodes in which the reader consults the expert about some type of revision
Writer/Expert Interactive Revisions	Episodes in which the writer consults the teacher about some type of revision
Redaer/Writer/Expert Interactive Revisions	Episodes in which both reader and writer discuss revision of a troublesource with the assistance of the expert

In order to answer the second research question --"What kinds of social relationships result from the participants' cognitive stages of regulation in an on-line peer revision context?", the researcher used de Guerrero and Villamil (1994)'s definitions for three kinds of regulation to analyze the participants' cognitive stages of regulation in on-task episodes. (See Table 3.3). For further details, please refer to Appendix F.

Table 3.3

Cognitive Stages of Regulation

Object-Regulated (OBR)	The cognitive stage in which novices are bound by troublesources and easily distracted away from the task due to the imperfect grasp of the goals and immature linguistic knowledge
Other-Regulated (OTR)	The cognitive stage in which novices start to be guided and identify a troublesource with others' assistance.
Self-Regulated (SER)	The cognitive stage in which learners present full capacities for problem-solving and the willingness to scaffold others due to successful internalization of linguistic knowledge or task requirements.

Next, the social relationships were determined in terms of symmetrical and asymmetrical peer interaction. According to de Guerrero and Villamil (1994), symmetrical peer interaction refers to the dyadic interaction in which the student reader and writer both are self-regulated (SER), other-regulated (OTR), and object-regulated (OBR), whereas asymmetrical peer interaction refers to the dyadic interaction in which the student reader and writer are at different stages of regulation, that is, whether they are other- vs. self-regulation (OTR/SER), other- vs. object-regulation (OTR/OBR), or object- vs. self-regulation (OBR/SER). (See Table 3.4). For further details, please refer to Appendix G.

Table 3.4

Social Relationships

Symmetrical Peer Interaction	Symmetrical peer interactions are situations in which both participants are self-regulated (SER/SER), other-regulated (OTR/OTR), or object-regulated (OBR/OBR).
Asymmetrical Peer Interaction	Asymmetrical interactions are situations in which each participant is at a different level of regulation. There are three types of asymmetrical interactions: OTR/SER, OTR/OBR, and OBR/SER.

In order to answer the third research question-- "What is the relationship between the

participants' cognitive stages of regulation and the received scaffolding?", the model of scaffolding functions proposed by Wood, et al. (1976) was used as the coding scheme to analyze the student readers' scaffolding behaviors in each on-task episodes. It should be acknowledged that although this model was originally designed to examine scaffolding provided by experts to novices, it is still assumed to have value on the classification of peer scaffolding, since numerous sociocultural researchers (e.g., Donato, 1994; Ohta, 1995; Swain & Lapkin, 1998) have observed the similar functions and equal power of assistance provided by experts and peers.

Nevertheless, in the actual coding process, , I and the other coder found that the original six scaffolding types, proposed by Wood, et al. (1976), still could not accommodate all the reviewing cases. Specifically, no scaffolding type had been created to describe the sharing behaviors appearing in the optimal SER/SER interaction. According to Lantolf and Ahmed (1989), while both individuals were highly self-regulated, they would share and respect each other's world. Such behaviors of "sharing" could therefore assist individuals not only arouse even higher self-confidence but also develop a sharper sense of audience and purpose, with which they might shape more sophisticated writing styles and contents. To better delineate the picture of scaffolding behaviors, the categorization of "sharing" was hence included as the seventh scaffolding type and will be exemplified by Excerpt 3.2 below.

Excerpt 3.2 (Revision Session 7) (Reader: Ryan; Writer: Louis)

1. Louis: 你覺不覺得我應該要再引述一下別人對王建明成就的看法來佐證他很厲害？ [Do you think I should quote people's opinions about Chien-Ming Wang's achievement in order to prove his excellence?]

2. Louis: 我是說在這一段之後…[I mean after this paragraph…]

3. Ryan: 嗯嗯 我同意 [Hmm. I agree with you.]

4. Ryan: 看完你的文章 知道王建明的球路很厲害又很有名之後… [After reading your article and realizing how marvelous and famous Chien-Ming Wang's ball path is…]

5. Ryan: 我也覺得你可以再增加一點別人的看法 [I also think you can add more

about others' opinions.]

6. Louis: 我有想到一點 像是 Torre 對小王的表現很放心 [I am thinking of one point, that is, Torre trusts Wang a lot.]

7. Ryan: 嗯嗯嗯 這可以放在他表現很穩的地方 [Hmm. This could be written in the paragraph about his stable performance.]

8. Ryan: 我另外有想到一點 就是很多他的隊友都說王建明是個話不多但很努力的人 [I also think of one more point. That is, many of Chien-Ming Wang's teammates say he is a silent but hard-working person.]

9. Louis: 好 這樣很有說服力 [Good! It is very persuasive.]

10. Louis: 謝啦 有想到啥要再跟我說喔 [Thanks. If you think of anything else, remember to tell me.]

11. Ryan: OK 互相切磋嘛 [We can learn from each other.]

Excerpt 3.2 represents the symmetrical SER/SER interactions, in which both the participants recognized and solved the problems via discussion, or more specifically the behaviors of sharing. As observed, the reader (alias "Ryan") did not play a traditional role as a powerful discussion leader or controller in this episode. Instead, he acted as a partner brainstorming and sharing ideas with the writer (alias "Louis"). This power equalization was also reflected in the writer's attempt to initiate the conversation (line 1 and 2) and both the peers' zeal to maintain idea exchange in conversation (line 1 to 5; line 6 to 9). In this light, the behavior of sharing, as the seventh scaffolding type, has highlighted the participants' self-confidence in creating meaningful texts and has successfully distinguished the self-regulation from the other two lower cognitive stages.

In short, the coding scheme of scaffolding functions eventually included seven scaffolding behaviors. (See Table 3.5 for brief definitions; see Appendix H for detailed category definitions.) Finally, with this modified coding scheme, the scaffolding functions were cross-tabulated with the participants' regulatory levels in order to find the relationship between the participants' stages of regulation and the received scaffolding.

Table 3.5

Scaffolding Functions

Recruitment	Enlist the learner's interest in the task.
Reduction in degree of freedom	Simplify the task.
Direction maintenance	Keep the learner motivated and in pursuit of the goal
Marking critical features	Highlight relevant features and point out discrepancies between what has been produced and the ideal solution
Frustration control	Reduce stress and frustration during problem solving
Demonstration	Model an idealized form of the act
Sharing	Share and respect each other's personal opinions

Quantitative and Qualitative Analysis

After all the coding procedures, the analysis results were quantified by showing the frequencies and percentages for the types of episodes, types of on-task episodes, stages of regulation, types of social relationships, and types of scaffolding functions. Then, these descriptive data were later qualitatively explained for any representative comment and any new category found in this study.

In sum, in this chapter, I have presented the setting, participants, and procedure of the study. Moreover, I have also explained the pilot study as well as the way I collected and analyzed the data. In the following chapter, I will present the results of the study based on the three research questions.

CHAPTER 4

RESULTS

In this chapter, I will present the results of the study based on the three research questions, that is, the types of dyadic interaction, the kinds of social relationships emerging from learners' cognitive stages of regulation, and the relationships between L2 learners' cognitive status and their received scaffolding. Under each question, there are several relevant themes emerging from the data.

Research Question 1: What types of interaction occur between members of a dyad engaged in on-line L2 peer revision?

Table 4.1 offers the frequencies and percentages of these three types of episodes: on-, off-, and about task. Of a total of 333 episodes, 71.8 percent of the episodes were in response to the on-task episodes, while the other two episodes trailing with lower percentages constituted a minority (28.2%) of interactions. This fact reflected the students' considerably high frequency of involvement in discussion related to one discrete troublesource or a series of connected troublesources. In other words, the students only spent a small portion of time on conversation unrelated to revision (e.g., chatting and joking) or on segments of discussion about task rules and procedures.

Table 4.1

Observed Frequencies and Percentages for Types of Episodes

Episode Type	Frequencies	Percentages
On-Task	239	71.8
About-Task	50	15.0
Off-Task	44	13.2

To explore the types of dyadic interaction embedded in on-line peer revision, the on-task episodes were further examined based on the coding scheme adapted from that of de Guerrero and Villamil (1994). As shown, Table 4.2 offers the frequencies and percentages of these six dyadic interaction patterns. Among the 239 on-task episodes, more than 70 percent were identified as Reader/Writer Interactive Revisions. Moreover, Reader Non-Interactive Revisions (20.9%) shared a higher percentage of on-task episodes than Writer Non-interactive Revisions (1.7%). Furthermore, the new CMC facilitated interaction type, "Reader/Writer/Expert Interactive Revisions", interestingly enjoyed a considerably larger portion (5.4%) than either Reader/Expert Interactive Revisions (0.4%) or Writer/Expert Interactive Revisions (0.4%).

Table 4.2

Observed Frequencies and Percentages for Types of On-Task Episodes

Interaction Type	Frequencies	Percentages
Reader/Writer Interactive Revisions	170	71.1
Reader Non-Interactive Revisions	50	20.9
Writer Non-Interactive Revisions	4	1.7
Reader/Expert Interactive Revisions	1	0.4
Writer/Expert Interactive Revisions	1	0.4
Reader/Writer/Expert Interactive Revisions	13	5.4

These interesting phenomena above may have conveyed the following three specific, but tightly-knit messages in answering the first research question: (1) Peer dyadic interactions could be diversified into idea interchange of different degrees along the continuum, (2) the role awareness may cause attitude diversity and shift among the participants, and (3) virtual experts acting as the catalyst may stimulate the on-line peer interactions. These three messages will be explained in detail in the following sections.

Peer interactions along the continuum: Weaker vs. stronger "Reader/Write Interactive Revisions"

As indicated, more than 70 percent of the on-task episodes corresponded to Reader/Writer Interactive Revisions. This result showed that more than 70% of the writing troublesources were solved through idea interchanges between peers. However, by looking into the data, I figured out that Reader/Writer Interactive Revisions were actually diversified. That is, they could be differentiated from each other according to the peers' different levels of participation. According to Villamil and de Guerrero (1996), dyadic interactions can be characterized by various social behaviors, such as relinquishing/appropriating, respect for authorship/lack of respect for authorship, and struggle for authorial control/maintaining authorial control. Based on such characterizations, I considered peer interactions to be a continuum where at one end the weakest communication occurs due to the absolute relinquishing/appropriating action, while at the other extreme the strongest peer communication occurs because of the balanced power and respect between peers.

The following Excerpt 4.1 and 4.2 display the two peer communicative situations occurring respectively in the weaker and stronger half of interactive continuum. They explain the ways how the participants assumed the roles and how they maintained or struggled for authorial control over the revision.

Excerpt 4.1 (Revision Session 10) (Reader: *Peter*; Writer: *Jill*)

1. Peter:	Let's move to the second paragraph.
2. Peter:	"He grew up too poor to have shoes and did not study beyond primary school."
3. Peter:	the word "beyond" … I am not sure that we should use this word or not!
4. Peter:	What do you think?
5. Peter:	Did you check the dictionary? Or…?
6. Jill:	I wanna show study after primary school.
7. Jill:	not study it
8. Jill:	or just the meaning "except for"

9. Jill: is it correct?? ~"~
10.Peter: or maybe u can use the simple one.
11.Peter: like this:
12.Peter: "He did not study (at school) after he graduated from elementary school."
13.Peter: how do you think?
14.Peter: ?
15.Peter: Well, I made the question and gave you another way to express the idea. But, you can choose which one you like.
16.Jill: Can I just write he grew up too poorly to have shoes and study except for primary school?
17.Peter: Okay! I think it's good!
18.Peter: Ok!
19.Jill: Ok!

Excerpt 4.1 is an example of the stronger Reader/Writer Interactive Revisions. In this episode, the reader (alias "Peter") displayed the respect for the writer's rights over the text by inquiring opinions (line 4 and 13). Such respect for authorship could also be observed from the use of the inviting word "let's" (line 1). Moreover, the reader even showed great intention of striking the balance between providing critical comments and avoiding the invasion of the writer's territory. That is, he presented great tactfulness and deference to soften the tone for making the suggestion (line 3 and 10) and leave the writer herself to make the final decision, as shown in "You can choose which one you like." (line 15). This willingness and friendliness to include the writer into revision apparently had triggered the writer (alias "Jill") to express more (line 6 to 8) and to further reveal uncertainties (line 9 and 16). In this sense, the revision could be seen as a product of collaboration between the peers. In other words, the "give-and-take" spirits had embodied the positive half of Reader/Writer Interactive Revisions, that is, the optimal peer interaction.

As the continuation of Excerpt 4.1, Excerpt 4.2 contrarily represents the weaker reader/writer interaction. Due to the unbalanced authorial power distribution, these two very participants, "Peter" and "Jill", here were stuck in a defective communication.

Excerpt 4.2 (Revision Session10) (Reader: *Peter*; Writer: *Jill*)

1. Peter:	I am going to move to next error.	
2. Peter:	I think the following sentence contains too much comma.	
3. Peter:	You should make the sentence longer or separate one sentence into two…	
4. Peter:	I correct it to this:	
5. Jill:	Hmm…	
6. Peter:	"He had picked up the coal in the roadside, the same as general child, since he was very young. The only difference was he gave all the money he had earned to his mother rather than spent it."	
7. Jill:	OK	
8. Jill:	You are so smart!!	
9. Peter:	or this:	
10.Peter:	"He had picked up the coal in the roadside which was the same as general child, since he was very young. The only difference was he gave all the money he had earned to his mother rather than spent it."	
11.Peter:	and the last word "it" means "money" from the previous sentence	
12.Peter:	Okay?	
13.Jill:	hmm…OK! OK!	

Excerpt 4.2 represents the weaker reader/writer interactive revision in which the reviewer and reviewee lack sufficient and substantial interaction. Such a defective communication is especially characteristic of the reader's directive, authoritative commands and the writer's passive, phatic answers in the conversation.

At the very beginning of this episode, the writer (alias "Jill") surrendered the authorship and gave up the lead during revision by remaining absolutely silent. By contrast, the reader (alias "Peter") obliterated the presence of the writer by using "I", instead of "we", as in "*I* am going to move to next error" (line 1), "*I* think the following sentence contains too much comma" (line 2), and "*I* correct it to this…" (line 4). Such authority was also reflected in the reader's commanding attitude, as shown in "You should make the sentence longer or separate one sentence into two" (line 3). Complying with the reader's authority and demands, the

writer eventually relinquished the status of author at the expense of losing her voice and being obedient, responding only with hollow and phatic words, such as "Hmm" (line 5 and 13), "Ok!" (line 7 and 13), and "You are so smart!" (line 8). In other words, the reader in this episode played the role of aggressive dominator, whereas the writer responded only as a passive knowledge receiver. In short, Excerpt 4.1 embodies the weaker Reader/Writer Interactive Revisions, or more specifically the case of "relinquished authorship" (Villamil & de Guerrero, 1996, p. 63).

Attitude awareness and shift: Readers' self-assumed responsibility vs. writers' great sense of dependence

A further analysis of non-interactive episodes revealed a higher percentage of Reader Non-Interactive Revisions (50, 21%) over Writer Non-Interactive Revisions (4, 1.7%). This result, on the surface, showed the reader-dominant situations in the on-line peer revision sessions. In depth, it reflected that the participants, when assigned the role of reviewer, intended to show greater eagerness in taking the initiative or in maintaining stronger or even absolute interactional control over the partner. The writers, on the contrary, tended to passively wait for answers, suggestions, or any indication of troublesources.

Yet, after looking down into the data, I further discovered that the role of reader, to some degree, might have been molded as a symbolic character responsible for the success of the whole revision session or for the peer's learning progress, whereas writers may just play an easy, sitting-back role whose duty was only to complete the drafts and wait for the correction. Based on this observation, I realized that the reader-dominate phenomenon, in actuality, may result from different role awareness the students held to distinguish each other, namely, the great sense of dependence in writers and the self-assumed responsibility of readers. Due to such different role awareness, the peers may eventually develop different attitudes to handle their revision jobs.

However, it should be acknowledged that such attitudes were never absolute. Instead, they were situated. Once the role was shifted, so was the attitude. The salient behaviors of "awareness of role and role switching" (Villamil & de Guerrero, 1996, p. 65) could be clearly observed in the following Excerpt 4.3 and 4.4.

Excerpt 4.3 (Revision Session 13) (Reader: *Ruby*; Writer: *Zack*)

1. Ruby:	I have a question…
2. Zack:	ya~?
3. Ruby:	In the second paragraph there is a small spelling bug
4. Ruby:	the first line…應是"two"不是"tow"~ […should be "two", instead of "tow"~]
5. Zack:	OH~ I see
6. Zack:	Hahaha
7. Ruby:	and in the third line "more strong and violent"
8. Ruby:	should be "stronger and more violent"
9. Ruby:	They are not really serious problems…just be careful!

Note: Inside the square bracket [ ] is the English translation of the participants' Chinese nicknames and Chinese messages.

Excerpt 4.3 is a typical reader-dominant example. Here the contrast in the attitudes between the reader (alias "Ruby") and the writer (alias "Zack") could be clearly observed. According to Villamil and de Guerrero (1996), there is seldom overt role awareness. That is, the fact that which roles are taken over by participants is seldom overtly mentioned in peer revision. Instead, the role awareness is usually presented in an implicit manner. As similarly shown in this excerpt, although Ruby, as the reviewer, did not overtly claim her authorship, she still successfully, but implicitly, displayed her strong role awareness by showing greater power and activeness to initiate and maintain the conversation. Such consciousness toward the authorship could also be seen from her affirmative tone (line 1 and 3) and a quick, definite answer (line 4). Even, in the latter segment of this excerpt, Ruby as an authoritative reader still posed and solved her own doubt peremptorily (line 7 and 8); the writer seemed to

have no chance or any intention to join revision. This attitudinal contrast between the reader's authority as "a critical eye, provider of suggestions, and simplifier of task" (Villamil & de Guerrero, 1996, p. 66) and the writer's timidity as a passive knowledge receiver or even a silent onlooker had greatly characterized the non-interactive revision, especially the type of Reader Non-Interactive Revision.

As the continuation of Excerpt 4.3, Excerpt 4.4 below contrarily shows the situation in which the same participants ("Ruby" and "Zack") switched their roles. Such swapped roles eventually led to an exchange in attitudes of the peers, although there is no explicit announcement about the role shift.

Excerpt 4.4 (Revision Session 13) (Reader: *Zack*; Writer: *Ruby*)

1. Zack:	I am not quite sure, but should you use 單數動詞 (is) in "On the other hand, there are different atmosphere in BE and F."?? [I am not quite sure, but should you use the singular form of verb (is) in "On the other hand, there are different atmosphere in BE and F."??]
2. Zack:	or plus "s" on "atmosphere"
3. Zack:	?
4. Ruby:	hmm…I will revise this point.
5. Zack:	and the sentence after that "it" should be capital
6. Zack:	On the other hand, there are different atmosphere in BE and F. It was not really comfortable for audience when they are watching BE…
7. Ruby:	OK~

In Excerpt 4.4, Zack abandoned his original role as a writer and tried to act as a reader. Unlike his previous passive attitude, Zack here surprisingly adopted a new, active manner; he acted as a discussion opener and indicated the possible troublesource in a suggestive tone (line 1 to 2). However, the reader's suggestive tone apparently failed to activate the writer's intention to join the conversation. The writer, Ruby, who was once a directive and

authoritative reviewer, here contrarily chose to maintain silent and inactive; she replied only with simple agreement (line 4 and 7). This contrast in attitudes between Excerpt 4.3 and 4.4 exactly reflects the participants' recognition and acceptance of their own roles. That is, the students assumed the role of reader to be an interaction controller and a suggestion provider, while the writer a sitting-back audience and a feedback receptor. Hence, once the roles were shifted, so were the attitudes. Only with such situated attitudes could the peers successfully fulfill their self-assumed roles and responsibilities.

"Reader/Writer/Expert Interactive Revisions": Experts as the stimuli to the
reader/writer interactions

As clearly shown in Table 4.2, the new interaction type, "Reader/Writer/Expert Interactive Revisions", dominated a higher frequency (5.4%) than Reader/Expert Interactive Revisions (0.4%) and Writer/Expert Interactive Revisions (0.4%). This result was actually consistent with the belief that CMC has the capability to serve as an "object to think with" and thus may stimulate the emergence of student-centered learning and support more on-topic dialogue, more justification for the positions, better use of evidence, and the exploration of alternative points of view (McAlister, Ravenscroft, & Scanlon, 2004; Shield, Davies, & Weininger, 2000; Winograd & Flores, 1988).

Based on the participants' conversation logs, it could be found out that experts, on-line sources particularly, were able to function as the stimuli to the peer interaction. That is, instead of having monologues alone, the participants were seemingly more willing to exchange ideas under the support of on-line resources. In this sense, on-line sources apparently served as an expert to mediate the participants to find a better position to respond or even defend themselves with their own opinions. Also, it was exactly this desire to express or defend oneself that triggered and prolonged the conversation.

The following Excerpt 4.5 and 4.6 present a contrast; the former is the revision episode

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in which there was no expert involved, while the latter is the one in which an expert was involved and functioned as an interaction catalyst. Specifically speaking, since the writer in Excerpt 4.5 somehow showed no intention to seek help, he seemed to be more isolated and thus tended to respond less. Contrarily, with the assistance of the expert, the writer in Excerpt 4.6 apparently seemed to be more confident in raising doubts or even objections to the suggestion given.

Excerpt 4.5 (Revision Session 7) (Reader: *Ryan*; Writer: *Louis*)

1. Ryan:	然後是第三段的最後一行 [Then, let's see the last line in the 3rd paragraph.]	
2. Ryan:	He played as a → he acted as a	
3. Ryan:	扮演某一角色用 act 較好 [It's better to use "act" when you talk about a certain role.]	
4. Louis:	:p 嗯嗯 [:p hmm hmm]	

As shown in Excerpt 4.5, the reader (alias "Ryan") is more like a controller rather than a reviewing collaborator. Contrarily, the writer (alias "Louis"), since somehow having no intention to seek external expertise scaffolding, showed less desire to question suggestions offered and thus only responded with an emoticon and an onomatopoetic word (line 4). In other words, without the intervention of any experts, this revision episode was merely based on the reader's directive monologue (line 1 through 3); the writer, in this case, may show little confidence and was directed to accept the suggestion given.

Contrary to Excerpt 4.5, Excerpt 4.6 below is featured by the intervention of the on-line expert. It is clear that the two very participants, "Ryan" and "Louis", with the support of the virtual expert, could engage themselves in more negotiation and deeper discussion.

Excerpt 4.6 (Revision Session 7) (Reader: *Ryan*; Writer: *Louis*)

1. Ryan:　　然後是第四段 [Then, it's in the 4th paragraph]
2. Ryan:　　encourage 後面是要加動名詞吧！[A gerund should be added to the word "encourage".]
3. Louis:　　等等，我看一下 [Wait! Let me check it.]
4. Louis:　　He encourages his fans studying.
5. Louis:　　我查了一下 Dr. Eye [I just checked Dr. Eye.]
6. Louis:　　這句對吧 [This sentence is correct, isn't it?]
7. Louis:　　我是覺得這樣應該是對的吧 [I think it should be right.]
8. Ryan:　　是喔 好吧 [Really? Okay.]

Specifically, in Excerpt 4.6, the writer (alias "Louis"), under the support of the translation software (Dr. Eye), seemed to have better chances to abandon the commonly assumed passiveness in writers, and was more active to think over the suggestion provided (line 3 through 7). In short, the writer with the scaffolding of the virtual expert might present more confidence to doubt the authority (line 6), to insist on his own answer (line 7), and even to push the reader to give in (line 8).

Research Question 2: What kinds of social relationships result from the participants' cognitive stages of regulation?

After discussing the interaction types, it is logical to go deeper to look into the peer social relationships embedded in dyadic interactions. To answer such a research question, the on-task episodes were internally analyzed in terms of the participants' cognitive stages of regulation, that is, whether they were object-regulated (OBR), other-regulated (OTR), or self-regulated (SER). Specifically, within the 239 on-task episodes, a total of 478 regulatory stage categorizations were made and coded. Table 4.3 presents the statistical results. As shown, the SER category was the highest (50%), to be followed by the OTR (36.4%) and OBR (13.6%) categories.

Table 4.3

Observed Frequencies and Percentages for Regulatory Stage Categorizations

Episode Type	Frequencies	Percentages
Object-regulated	65	13.6
Other-regulated	174	36.4
Self-regulated	239	50

When regulatory stage categorizations were cross-tabulated with reader/writer roles, significant differences were found. (See Table 4.4) That is, self-regulation predominated among the readers, while other-regulation predominated among the writers. This result, on one hand, revealed the readers' greater self-confidence and problem-solving capability in terms of revision content, language use, or task goals. On the other hand, it also proved the fact that the writers tended to let themselves guided under the assistance, or more precisely "scaffolding", of the readers or of virtual experts (e.g., on-line dictionaries) in order to advance towards the completion of tasks. Also, it is edifying to note that such results have further corresponded to those of the first research question, that is, the role awareness may result in a distinct attitudinal contrast and shift among the participants in revision sessions.

Table 4.4

Observed Frequencies and Percentages for Regulatory Stage Categorizations according to Reader and Writer Roles

Regulatory stage	Reader		Writer	
	n	%	n	%
Object-regulated	4	0.8	61	12.8
Other-regulated	20	4.2	154	32.2
Self-regulated	216	45.2	23	4.8

Table 4.5 below presents the frequencies and percentages of symmetrical and asymmetrical social relationships in overall on-task episodes. As indicated by de Guerrero

and Villamil (1994), different patterns of social relationships resulted from the participants' stages of cognitive regulation. Hence, symmetrical relationships occur when the peers were at the same stages of regulation and shared the equal control over the revision tasks. On the contrary, asymmetrical social relationships took place when the one of the peers had larger control of the tasks. In this light, symmetrical relationships included in Table 4.5 were the three interactive types: OBR/OBR, OTR/OTR, and SER/SER. Within the asymmetrical social relationships were the other three interactive patterns (OBR/SER, OBR/OTR, and OTR/SER), the two non-interactive revision patterns ("Reader Noninteractive Revisions" and "Writer Noninteractive Revisions") as well as the two reader-/writer-excluded revision patterns ("Reader/Expert Interactive Revisions" and "Writer/Expert Interactive Revisions").

Table 4.5

Observed Frequencies and Percentages for Symmetrical and Asymmetrical Relationships in On-Task Episodes

Social Relationships	Frequencies	Percentages
Symmetrical		
OBR/OBR	6	2.5
OTR/OTR	16	6.7
SER/SER	18	7.6
Asymmetrical		
R Noninteractive Revisions	50	21
W Noninteractive Revisions	4	1.7
R/E Interactive Revisions	1	0.4
W/E Interactive Revisions	1	0.4
OBR/SER	21	8.8
OBR/OTR	0	0
OTR/SER	121	50.8

Based on the above-mentioned characterizations, more asymmetrical social relationships (83.2%) were found over symmetrical ones (16.8%) among the participants. This result has displayed the fact that most of the on-task episodes were engaged in the participants' different

regulatory levels and unequal power over the tasks.

Moreover, a further analysis of symmetrical and asymmetrical relationships within the interactive revisions (inclusive of "Reader/Writer" and "Reader/Writer/Expert" Interactive Revisions) revealed a majority of OTR/SER interactions (66.7%), followed in the second place by OBR/SER interaction (11.5%) and in the third and forth place by SER/SER (9.8%) and OTR/OTR (8.7%) interactions. Other relationships (e.g., OBR/OBR and OBR/OTR) trailed with very low or negligible percentages, as shown in Table 4.6.

Table 4.6

Observed Frequencies and Percentages for Symmetrical and Asymmetrical Relationships in Reader/Writer and Reader/Writer/Expert Interactive Revisions

Social Relationships	Frequencies	Percentages
Symmetrical		
OBR/OBR	6	3.3
OTR/OTR	16	8.7
SER/SER	18	9.8
Asymmetrical		
OBR/SER	21	11.5
OBR/OTR	0	0
OTR/SER	122	66.7

Such results, along with further qualitative analysis, could at least display the following two interesting phenomena: (1) The two subtypes of the OTR/SER interactions (authoritative and collaborative) embodied the spirit of ZPD, and (2) the scaffolding could be the impulse pushing the peers of symmetrical social relationships forward to higher forms of regulation. More representative comments of cognitive stage categories will be extracted from the data during the following qualitative analysis.

Authoritative vs. collaborative: Two subtypes of OTR/SER recapitulating ZPD

As observed, the major OTR/SER interactions could not only represent the typical asymmetrical social relationships predominating in on-line revision sessions, but also well embody the Vygotskian idea of ZPD. For Vygotsky (1978), an instructional environment could be created by more skilled peers assisting less capable ones in completing particular tasks. In other words, the scaffolding provided by more capable ones would be the key to the cognitive development of the learners.

To further understand how peer scaffolding intervened, I analyzed the OTR/SER interactions to examine whether they are characteristic of authoritative or collaborative scaffolding behaviors. According to de Guerrero and Villamil (1994), these two subtypes (authoritative and collaborative) of interaction were respectively featured by "personality clashed or absence of negotiation between the partners" (p. 488) and strategic assistance. Based on this categorization, the results showed more collaborative interventions (63.7%) than authoritative interventions (36.3%), as shown in Table 4.7.

Table 4.7

Observed Frequencies and Percentages for Types of OTR/SER interactions

Episode Type	Frequencies	Percentages
Collaborative	77	63.1
Authoritative	45	36.9

These two distinct subtypes of social relationships within the OTR/SER category could be exemplified by the following two excerpts. Excerpt 4.7 represents the authoritative OTR/SER intervention featured by absolute power monopoly and relinquishment. By contrast, Excerpt 4.8 depicted the collaborative OTR/SER intervention in which the self-regulated peer became a strategic assistant promoting the transition towards

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self-regulation on the part of the less-skilled partner.

Excerpt 4.7 (Revision Session 10) (Reader: *Peter*; Writer: *Jill*)

1. Peter:	NEXT!	
2. Peter:	This is one of your sentences: "A child who was always hungry suddenly began to deal with a lot of jars of rice everyday, so he felt very happy, and worked extremely diligently."	
3. Peter:	Maybe you should not make too many small sentences in one big sentence.	
4. Peter:	So I suggest that you should write it like this:	
5. Peter:	"A child who was always hungry suddenly began to deal with a lot of jars of rice everyday, so he felt very happy and worked extremely diligently."	
6. Jill:	hmmm…I see…	
7. Peter:	and the next sentence is the same.	
8. Peter:	"One year later, he founded his own rice shop, which was started up with 200 dollars borrowed from his father in Chiayi, and he worked as a young master."	
9. Peter:	….still have too many commas in one sentence.	
10.Peter:	Maybe you should separate it into two or more sentences.	
11.Jill:	Like this? "One year later, he founded his own rice shop with 200 dollars borrowed from his father and he worked as a young master."	
12.Peter:	Yes, it's better!	

As mentioned, Excerpt 4.7 is an example of authoritative interventions embedded in the OTR/SER interactions. In this excerpt, the reader (alias "Peter") played the role of a self-regulated learner who helped the other-regulated partner (alias "Jill") revise the writing with a domineering attitude, that is, quick problem-raising (line 2 and 7) and quick answer-giving (line 3 to 4 and 8 to 9). As observed, the whole problem-solving process was mostly featured by Peter' monologues (line 2 to 5 and 8 to 10); he himself indicated a better way to revise the writing and did not provide any space and time for the writer to negotiate or pose questions. Moreover, this authoritative attitude could also be reflected in the writer's short answer, "hmmm…I see…" (line 6). With such an empty response, the writer revealed his failure of holding power as well as little intention to argue with the authority. In this case,

the only clue to the writer's cognitive stages of regulation (other-regulation) is Jill's final

re-written sentence (line 11), which showed her successful recognition of the troublesource

and the completion of the task with Peter' authoritative interventions.

However, unlike Excerpt 4.7, Excerpt 4.8 below represents the example of collaborative

OTR/SER interactions. Different from the authoritative problem solving process, Excerpt 4.8

is featured by a strategic collaboration, with which the self-regulated peer led the

other-regulated partner to be aware of the troublesource, to find potential solutions, and to

eventually solve the problems.

Excerpt 4.8 (Revision Session 17) (Reader: *Katy*; Writer: *Kevin*)

1. Katy:	Even he changes the past again and again to try to let every friend of him can live "happily"
2. Katy:	你知道爲什麼要用 happily 嗎？[Do you know why we have to use "happily"?]
3. Kevin:	不知道 [No, I don't know.]
4. Kevin:	爲什麼？ [Why?]
5. Katy:	happily 前面是什麼字？[What's the word before "happily"?]
6. Kevin:	live
7. Katy:	對！因爲 live 是動詞 [Right! Because "live" is a verb,…]
8. Katy:	所以用副詞來修飾動詞 […then we use an adverb to modify a verb.]
9. Katy:	形容詞的話你後面要有名詞 [If it is an adjective, you can have a noun behind.]
10.Kevin:	喔喔 所以就是副詞配動詞 形容詞配名詞 [Ohoh. So adverbs go with verbs, and adjectives go with nouns.]
11.Kevin:	我以前都是憑感覺在用 [I used to use those words by instinct.]

In this excerpt, the self-regulated reader (alias "Katy") posed a series of strategic

questions to engage the writer (alias "Kevin") in the problem recognizing and solving process.

Specifically, Katy first used an open-ended question to help her partner recognize the

function and the position of adverbs (line 2). Moreover, even when "Kevin" failed to answer the question (line 3 to 4), Katy still cast another question (line 5), instead of direct answers, to elicit the writer's awareness toward the troublesource. That is, Katy tried to see the problem through the eye of Kevin in order to help him eventually achieve the goal (line 10). From the Vygotskian view, Katy's instructional, strategic assistance was indeed the scaffolding that moved Kevin forward and helped him further achieve a higher degree of control over the task in his ZPD.

Symmetrical social relationships: SER/SER, OTR/OTR, and OBR/OBR

Though asymmetrical social relationships prevailed in on-line peer revisions, 21.8% of the interactive revisions were still identified as symmetrical situations. In other words, both of the participants, in more than a quarter of interactive episodes, were self-regulated (SER/SER), other-regulated (OTR/OTR), or object-regulated (OBR/OBR).

Based on the participants' conversation logs, I discovered that these three types of symmetrical peer interactions were more like a continuum where at the optimal end both the self-regulated peers (SER/SER) solved troublesources without any external assistance, while at the other extreme the object-regulated peers (OBR/OBR) were both controlled by drafts and could not make any progress towards improvement. In this sense, the midpoint might be considered to be the OTR/OTR situation in which both the peers settled on a temporary satisfactory solution, even if not completely correct, due to their limited rhetorical and linguistic knowledge. Most important of all, I acknowledged that the key factor that pushed the peers at the same cognitive stages to move from the fundamental to the optimal during on-line revision was if they resorted to "outside help" (de Guerrero & Villamil, 1994, p. 492). This relationship between the scaffolding and the progress in the cognitive stages of regulation will be explained in detail in the following Excerpt 4.9, 4.10, and 4.11. These three excerpts respectively represent the OBR/OBR, OTR/OTR, and SER/SER interactions.

Excerpt 4.9 (Revision Session 2) (Reader: *Henry*; Writer: *Tim*)

1. Tim:　　　對了 我一直不懂那個 previsional 為啥會一直被圈出來 [By the way, I don't understand why the word "previsional" is always marked.]

2. Henry:　　應該是 word 裡面沒這個字吧 [It should be because there is no such a word in Microsoft Word.]

3. Tim:　　　是嗎？ [Yeah?]

4. Henry:　　嗯嗯 先跳過好了 [Hmm… Let's skip this part.]

In Excerpt 4.9, both the participants were object-regulated (OBR/OBR). Apparently, the writer (alias "Tim") and the reader (alias "Henry") were both bound by a misspelling word, "previsional", in the text. They could neither understand the reason why the word was marked wrong by Microsoft Word nor resort to outside help (e.g., on-line or electronic dictionaries) for any possible progress. They were somehow "stuck" with this troublesource, considering it might be an imperfection of the Microsoft Word system, and thus finally decided to abandon the revision task. In short, these two object-regulated learners seemingly failed to seek possible scaffolding and hence kept going in circles without making any progress in this revision episode.

However, Excerpt 4.10, as the continuation of Excerpt 4.9, showed another story. That is, these two very participants, "Henry" and "Tim", here eventually moved forward to the status of OTR/OTR. Such a progress in the cognitive stages of regulation might be attributed to the participants' efforts to seek peer assistance and other referential information as their external scaffolding.

Excerpt 4.10 (Revision Session 2) (Reader: *Henry*; Writer: *Tim*)

1. Henry:　　看一下後面這一句的 heap [Let's see the word "heap" in the following sentence.]

2. Henry:　　你是要用讚揚的意思嗎？ [Do you mean praise?]

3. Henry:　　我在字典查到有 heap praise on [I found "heap praise on" in the dictionary.]

4. Tim:	不算是讚揚 而且這句不是我寫的 是參考 Times 上的句子 因為我覺得寫得很棒！[Not really! And this sentence is not written by me. I made reference to the Time magazine, because I think they write very well.]
5. Henry:	heap 好像有堆積的意思 [The meaning of "heap" is somehow similar to "pile up."]
6. Tim:	我覺得這句話有反諷的意思 [I think this sentence shows sarcasm.]
7. Henry:	可能喔 其實後面這幾句我看不懂 [Maybe! Actually I don't understand the following sentences.]
8. Tim:	我是看雜誌上的中文翻譯 [I read the Chinese translation in this magazine.]
9. Tim:	Even the Wall Street Journal called his plan "an economic crime", and critics everywhere heaped "Fordism."
10.Tim:	甚至華爾街日報都稱他的計畫是經濟犯罪，並且各樣的評論堆積成所謂的福特主義 [Even the Wall Street Journal called his plan "an economic crime", and all kinds of critics were piled up and formed the so-called "Fordism."]
11.Henry:	照抄好像不行耶 但是我也不知要如何改寫 [You cannot plagiarize the sentence. But I do not know how to rewrite it?]
12.Tim:	抱歉！其實我是感覺雜誌寫得很棒，自己又想不到好的句子，所以就拿來用了 [Sorry! Actually I think the magazine writes so well, and I can't figure out any good sentence, so I just copy this sentence.]
13.Henry:	不會啦…其實你整篇文章讀起來很通順也很完整 [That's alright…actually your writing is very fluent and complete.]

Specifically, unlike Excerpt 4.9, Excerpt 4.10 represents a symmetrical OTR/OTR situation in which both the reader (alias "Henry") and the writer (alias "Tim") were capable of offering each other necessary scaffolding in spite of their final failure of completing the task. Such scaffolding could be the reader's word explanation (line 1 to 3 and line 5), the writer's sentence explanation (line 6 and line 8 to 10), or the reminder of not plagiarizing (line 11). In addition to the peer assistance, the scaffolding also appeared in the form of dictionary (line 3) and magazine (line 8 to 10), that is, the "outside help" as de Guerrero and Villamil called (1994, p. 492). Such varieties of "outside help" indeed helped the peers become aware of the overall purpose of the revision session and pushed them to find possible

ways to improve the writing problems. Although the final results were still somehow erratic due to the participants' limited linguistic knowledge, such behaviors of recurring to external scaffolding still prevented them from being controlled by the rudimentary draft and, most important of all, help them "understand more clearly what to revise, how to revise, and why they need to do so" (Goldstein & Conrad, 1990, p. 457).

Finally, Excerpt 4.11 below is the example of the SER/SER interactions. In this episode, the students were found to accomplish the task without assistance; they themselves had possessed the capability to solve problems alone. Yet, it is also noted that the scaffolding—that had once moved other students to higher levels of regulation (as shown in Excerpt 4.11)—had expanded to include the "sharing" behaviors. Such sharing behaviors, in actuality, did not aim for problem solving, but for appreciating and respecting each other's ideas and opinions.

Excerpt 4.11 (Revision Session 17) (Reader: *Katy*; Writer: *Kevin*)

1. Katy:	"In the end, he backs to the past when he was unborn by watching a video and finds himself strangled to die."
2. Katy:	這句看不太懂ㄟ [I don't quite understand this sentence.]
3. Kevin:	喔~這我要說明一下了 [Oh~ I can explain it.]
4. Kevin:	這個結局是他最後看了他父母在他出生前錄的錄影 然後他就回到了那個時候的他… [The ending is that he finally watched the video his parents recorded before he was born, and then he went back to that moment…]
5. Katy:	就是回到出生前？ [Back to the moment he was not born?]
6. Kevin:	是啊！還有他也發現他在媽媽的肚子裡被臍帶給勒死了 [Yes. And he also found he was strangled to die in his mother's womb.]
7. Katy:	了解！好悲！[Now I understand. How sad the ending is.]
8. Kevin:	還有他也發現他被勒死後 大家仍然過著很美好的生活 [And he also found everybody still led their wonderful life after he was strangled to die.]
9. Kevin:	我有看過這電影的網站 導演說他喜歡這個結局 [I read the website of this movie. The movie director said he liked this ending a lot.]

10.Katy:　　是喔…我還是比較喜歡另一部我們看的結局　[Yeah? But I still prefer the ending of the other movie we saw.]

11.Katy:　　這結局太慘了！[The ending is really too sad.]

12.Kevin:　　所以我認為這是一部悲劇片啊～　[So that's why I think it is a tragedy.]

As mentioned, Excerpt 4.11 is an example of the SER/SER interactions. In this revision episode, hardly could we find any existence of external experts; both of the participants had gained clear visions of the goals to achieve and mature linguistic/rhetorical knowledge to employ. However, it is still worthy to emphasize the existence of peer scaffolding in this optimal situation. That is, the peer scaffolding, as observed in this case, was mutually provided by Katy and Kevin to clarify and reinforce each other's ideas (line 4 through 12). Specifically speaking, such scaffolding was not like the instructional cueing/hinting mechanisms in lower-regulated situations anymore. Instead, it is more like the behavior of sharing via which the participants were able to express their own views and, at the same time, respect the other's private world.

By browsing the excerpts above, it could be figured out that these three types of symmetrical social relationships (OBR/OBR, OTR/OTR, and SER/SER) formed a continuum where the peers struggled to move from the fundamental to the optimal level of cognitive regulation. Most importantly, the behaviors of recurring to outside help, whether from virtual experts or peers, indeed played the crucial role in the progress of cognitive regulation. Only with these various forms of scaffolding could the peers avoid being trapped by their imperfect texts and move forward to a higher level of cognitive regulation. Such a close relationship between the scaffolding and the learners' regulatory levels will be further expanded and discussed in the third research question.

Research Question 3: What is the relationship between the participants' regulatory levels and their received scaffolding?

To answer the third research question regarding the relationship between the regulatory levels and the scaffolding received, the coding scheme, adapted from that of Wood, et al. (1976), was used to code the interactive episodes. This modified coding scheme includes seven scaffolding categorizations – "Recruitment", "Reduction in Degree of Freedom", "Direction Maintenance", "Marking Critical Features", "Frustration Control", "Demonstration", and "Sharing".

It should be emphasized that, as shown in Table 4.8, more than one type of scaffolding might be used in one individual episode. That is, various scaffolding assistance could be coded in each episode, and thus the totality of the scaffolding assistance might be larger than that of episodes or that of social relationships.

Table 4.8

Observed Frequencies and Percentages for Scaffolding Assistance according to Social Relationships in Interactive Episodes

	Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	Type 7
Asymmetrical							
OBR/SER	1 (2.1%)	4 (8.3%)	2 (4.2%)	13 (27.1%)	7 (14.6%)	21 (43.8%)	0 (0%)
OBR/OTR	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
OTR/SER	1 (0.4%)	45 (17.5%)	34 (13.2%)	109 (42.4%)	23 (8.9%)	30 (17.5%)	0 (0%)
					Total number of scaffolding in asymmetrical episodes: 293		
Symmetrical							
OBR/OBR	0 (0%)	2 (22.2%)	4 (44.4%)	1 (11.1%)	2 (22.2%)	0 (0%)	0 (0%)
OTR/OTR	0 (0%)	5 (14.7%)	12 (35.3%)	8 (23.5%)	7 (20.6%)	2 (5.9%)	0 (0%)
SER/SER	0 (0%)	1 (4.8%)	3 (14.3%)	3 (14.3%)	0 (0%)	4 (19%)	10 (47.6%)
					Total number of scaffolding in symmetrical episodes: 64		

Type 1= "Recruitment"; Type 2= "Reduction in Degree of Freedom"; Type 3= "Direction Maintenance"; Type 4= "Marking Critical Features"; Type 5= "Frustration Control"; Type 6= "Demonstration"; Type 7= "Sharing"

Based on the results, it is clear that more scaffolding behaviors were found in the asymmetrical social relationships than in the symmetrical ones. This might be due to the fundamentally different nature of regulatory behaviors. That is, self-regulated peers with strong leadership and self-assurance might present a genuine desire to help, while other-regulated or object-regulated peers might contrarily show the need to be taken by expertise peers or the despair when not knowing what to do (de Guerrero & Villamil, 1994). Moreover, it is also obvious that the behavior of "sharing", as a newly found scaffolding type, only appeared in the optimal SER/SER episodes. This finding, on one hand, reflected the fact that the self-regulated pairs might have less needs to offer each other step-by-step tips, and therefore would less use the other six types of scaffolding. On the other hand, it also showed that the SER/SER interaction was a highly developed communication, in which the peers with a sharper sense of audience and more mature self-confidence had developed stronger needs to inspire and share with each other.

In addition to the findings above, two more significant phenomena were also found. First, "Marking Critical Features" and "Demonstration" were the two scaffolding types that distinguished OBR/SER and OTR/SER from each other. Second, in asymmetrical OTR/SER interactions, intrinsic scaffolding predominated in collaborative interventions while extrinsic scaffolding predominated in authoritative interventions. These two phenomena will be explained in detail in the following two sections.

"Marking Critical Features" vs. "Demonstration": The distinction between

asymmetrical OTR/SER and OBR/SER interactions

Based on the results, it is noted that, within the OBR/SER interactions, the scaffolding of "Demonstration" (43.8%) enjoyed higher percentage of occurrence than "Marking Critical Features" (27.1%). However, within the OTR/SER interactions, "Marking Critical Features"

(42.4%) contrarily was higher than "Demonstration" (17.5%). Such findings may be mainly attributed to the disparity existing between the stages of object-regulation and of other-regulation. Specifically, since object-regulated peers failed to carry out tasks and to engaged themselves in constructive dialogue, their self-regulated partners tended to take the lead and model idealized forms of acts in order to achieve certain preset goals. Contrarily, since other-regulated peers could advance towards completion of tasks under strategic assistance (e.g., marking critical features), the act of demonstrating appropriate answers explicitly would not be necessary. In this sense, "Demonstration" and "Marking Critical Features" would be the two scaffolding types that distinguished OBR/SER and OTR/SER from each other. This observation could be further illustrated in the following Excerpt 4.12 and 4.13.

Excerpt 4.12 (Revision Session 14) (Reader: *Peter*; Writer: *Cherry*)

1. Peter:	Move to the sentence in the second paragraph…"Therefore, both of them <not clear> rewrote the history in order to make things better."	
2. Peter:	the word "them" is not clear	
3. Cherry:	I should point out two movies.	
4. Cherry:	both of "Butterfly Effect" and "Frequency"	
5. Peter:	yes	
6. Cherry:	but I have a question…	
7. Cherry:	Can I point out the two main characters?	
8. Cherry:	because the two people rewrote the history…not the two movies	
9. Peter:	oh ya~ that's right!!!	

Excerpt 4.12 is a typical example illustrating the relationship between the asymmetrical OTR/SER interaction and the scaffolded assistance provided. In this episode, the self-regulated reader (alias "Peter") firstly highlighted the critical rhetorical problem (line 2) by inserting two words ("not clear") as a hint into the writer's original sentence(line 1). It is apparent that only with such intrinsic, implicit scaffolding as "Marking Critical Features"

could the writer (alias "Cherry") successfully undertake a series of revision actions (line 3 to 4; line 6 to 8). In other words, there is no need for the reader to further demonstrate the appropriate forms of acts; the writer himself could reach the goal with the minimum assistance. In short, this episode explained the fairly low percentage of "Demonstrating" in the OTR/SER interactions.

By contrast, the Excerpt 4.13 will explain the ways how the scaffolding of "Demonstrating" features in the OBR/SER interactions. That is, since the object-regulated learner could be easily trapped in his/her cognitive straits, the more explicit, extrinsic scaffolding, such as "Demonstrating", would be needed.

Excerpt 4.13 (Revision Session 8) (Reader: *Cherry*; Writer: *Lucy*)

1. Cherry:	You got a problem here…"put into practice"	
2. Lucy:	??	
3. Cherry:	put ____ into practice	
4. Lucy:	??	
5. Cherry:	put "WHAT" into practice	
6. Lucy:	I don't understand…@@	
7. Cherry:	你要把東西寫出來 你是想要把什麼 put into practice??? [You have to point out the thing. What do you want to put into practice???]	
8. Cherry:	got it?...受詞啦 [the object la]	
9. Lucy:	……	
10. Cherry:	Ok! It should be "put the theory into practice".	
11. Cherry:	See this sentence…"We were never failure"	
12. Lucy:	????	
13. Cherry:	"failure" is a noun.	
14. Cherry:	Maybe you should say "We never fail"…it's more appropriate.	

Note: The symbol of vertical "…" stands for message omission.

Specifically, Excerpt 4.13 combines two OBR/SER interactive episodes (line 1 to 10; line 11 to 14), in which the self-regulated reader (alias "Cherry") intended to assist the

object-regulated writer (alias "Lucy") to find and solve the troublesources. The difference between these two episodes lies in the scaffolding types that Cherry used. In the first episode (line 1 to 10), Cherry used a series of "Marking Critical Features" (line 1, 3, 5, 7, and 8), expecting Lucy could sense the discrepancies between what had been produced and the ideal form of sentence. However, as observed, these attempts were all in vain; Lucy was apparently "stuck" in the object-regulated situations and hence could not understand the overall purpose of the revision (line 2 and 4) as well as engage in any constructive dialogue with Cherry (line 6 and 9). Thus, there was an obvious absence of questions on the part of Lucy. At the end of the first episode, Cherry had only to directly "demonstrate" the appropriate answer (line 10).

However, in the second episode, Cherry, being aware of the object-regulation on the part of Lucy, was found to abandon the intrinsic way of "marking critical features", and directly provided scaffolding by "demonstrating" the correct grammar and its corresponding answer (line 13 and 14). These two episodes above have clearly illustrated the high percentage of "Demonstrating" and the low percentage of "Marking Critical Features" in the asymmetrical OBR/SER interactions. Also, they highlighted the high correlation between the scaffolding types and the learners' cognitive stages of regulation.

Intrinsic vs. extrinsic: Two scaffolding types featuring OTR/SER interactions

Another interesting phenomenon is the close relationships between the scaffolding types and the OTR/SER interactions. As previously observed in the second research question, the asymmetrical OTR/SER interactions may embody the Vygotskian spirit of ZPD. Moreover, it is also acknowledged that the OTR/SER situations presented two subtypes of peer interventions, that is, authoritative and collaborative. In other words, the OTR/SER interactions were observed to be one instructional environment in which less skilled peers could complete particular tasks under guidance of or in collaboration with more capable ones.

To realize the relationships between the scaffolding types and the two subtypes of

OTR/SER interactions, the authoritative and collaborative interventions were cross-tabulated with the seven scaffolding types. Table 4.9 below presents the results.

Table 4.9

Observed Frequencies and Percentages for Scaffolding Categorizations according to Authoritative/Collaborative Interventions (OTR/SER)

Scaffolding Types	Authoritative (45 episodes)		Collaborative (79 episodes)	
	n	%	n	%
Recruitment	0	0	1	0.6
Reduction in Degree of Freedom	8	9.2	37	23.9
Direction Maintenance	6	6.9	28	18.1
Marking Critical Features	38	43.7	71	45.8
Frustration Control	8	9.2	15	9.7
Demonstration	27	31	3	1.9
Sharing	0	0	0	0
Total	87	100	155	100

As presented in Table 4.9, a total of 87 scaffolding behaviors were found in the authoritative interventions and 155 found in the collaborative interventions. Specifically, in the authoritative interventions, "Demonstration" (31%) was the most identified scaffolding type, followed by "Marking Critical Features" (43.7%) in the second place. Other types trailed with considerably low percentages. Yet, in collaborative interventions, the scaffolding of "Marking Critical Features" (45.8%) was the highest, to be followed by "Reduction in Degree of Freedom" (23.9%) in the second place and "Direction Maintenance" (18.1%) in the third place. It is worthy to note that "Demonstration" (1.9%) suffered a very low percentage in this category.

Based on such results, it is realized that "Marking Critical Features" was a popular scaffolding type used by peers, whether in the collaborative or authoritative interactions, to indicate troublesources or highlight discrepancies between the ideal and the defect. However,

the high percentage of "Demonstration" in the authoritative interventions as well as the high percentage of "Reduction in Degree of Freedom" and "Direction Maintenance" in the collaborative interventions showed the distinction between the OBR/SER and OTR/SER interventions. That is, the authoritative participants tended to apply more extrinsic scaffolding (e.g., modeling and demonstration) in revisions, while the collaborative peers tended to use more intrinsic scaffolding (e.g., cueing, hinting, and providing coaching comments) to help simplify the tasks and keep less-skilled peers motivated and in pursuit of the final goals.

The following Excerpt 4.14 and 4.15 will illustrate the high correlation between the extrinsic/intrinsic scaffolding and the authoritative/collaborative interventions.

Excerpt 4.14 (Revision Session 10) (Reader: *Peter*; Writer: *Jill*)

1. Peter:	then I am going to talk this sentence…
2. Peter:	"Thus, this small rice shop became the beginning that Wang Yung-Ching started his undertaking, and at the same time the form of a family firm was born from this, too."
3. Peter:	I think you should use the word "corporation" instead of "undertaking".
4. Peter:	although they have similar meanings…
5. Peter:	but, here, use undertaking seems to be a little strange.
6. Peter:	and the word "born" is strange, too.
7. Jill:	Oh…really?
8. Peter:	I've never heard that a firm is "born" from a corporation.
9. Peter:	maybe I am not right, but it really sounds strange.
10.Peter:	so I choose the simple word "started" to replace the words "was born".
11.Peter:	and the sentence becomes:
12.Peter:	"Thus, this small rice shop became the beginning that Wang Yung-Ching started his corporation, and at the same time the form of a family firm was started from this, too."
13.Jill:	hmmm…OK
14.Jill:	I see.

Excerpt 4.14 represents the OTR/SER authoritative intervention. As clearly observed, there was no clear negotiation or communication between peers in this episode. The

self-regulated reader "Peter" authoritatively controlled the task (line 1 to 6; line 9 to 11) and even disregarded the doubt of the writer (line 7). This authority could also be seen from such subjective statements as "*I* think…" (line 3) and "*I* choose…" (line 9). In other words, this self-regulated, authoritative reader promoted his own views at the expense of the other-regulated peer. The writer (alias "Jill"), in this case, seemed only to comply with and acquiesce to the domineering power (line 12 and 13); he apparently lost the chance to find the troublesources by himself, and hence eventually failed to move forward to a higher stage of regulation. In response to this authoritative attitude, certain directive scaffolding, such as "Demonstration" (line 3, 10, and 11), was thus used to offer quick answers – even before the action of indicating any troublesource (line 3 to line 5).

Contrary to Excerpt 4.14, Excerpt 4.15 represents the collaborative OTR/SER interactions featured by intrinsic scaffolding behaviors. Instead of constructing a commanding and authoritative environment, Excerpt 4.15 below displays the coaching, supportive assistance that guided the writer to achieve the goal step by step.

Excerpt 4.15 (Revision Session 7) (Reader: *Ryan*; Writer: *Louis*)

1. Ryan:	你這邊的問題是有關於 topic sentence… [Your problem here is about the topic sentence…]
2. Ryan:	文章的一開頭 [the very beginning of the article]
3. Louis:	是不是不夠明顯？[Is it not clear enough?]
4. Ryan:	嗯嗯 你只有說他是歌手和演員 不夠清楚也不夠特別 [Hmm. You only said he is a singer and actor. It's neither clear nor special enough.]
5. Ryan:	你覺得怎樣寫才可以顯出他的特別？[In what way do you think his uniqueness can be shown?]
6. Louis:	嗯 我想想看 [Hmm. Let me think about it.]
7. Louis:	He is a famous actor and a singer in Asia….?
8. Louis:	這樣有比較清楚嗎？還是要再加強？我說他是個 "famous" singer，而且還說他在亞洲很有名 [Is it clearer? Does it still need to be improved? I say he is a "famous" singer. I also say he is famous in Asia.]
9. Ryan:	有比較好 但是還是不夠清楚呀 [It's better. But it's still not clear

enough.]

10.Louis
: 唉 [sigh…]

11.Ryan: 他是什麼類的歌手？什麼類的演員？爲啥有名？[What kind of singer he is? What kind of actor? Why is he so famous?]

12.Louis
: I see…….我一下寫不太出來 讓我想想 [I can't come up with the answer right away. Let me think about it.]

⋮   ⋮

13.Louis: He is a famous rock singer and a comedy actor in a popular TV comedy series…Is it ok now?

14.Ryan: 嗯 這樣不錯 [Hmm. It's quite nice.]

As mentioned, Excerpt 4.15 is an example of OTR/SER collaborative interventions. In this episode, the self-regulated reader (alias "Ryan") intended to help the other-regulated writer (alias "Louis") to clarify and strengthen the topic sentence. The same as the previous authoritative situation (Excerpt 4.14), the reader here first applied the commonly used scaffolding of "Marking Critical Features" to indicate the problem (line 1) and pointed out the discrepancy between the produced and the ideal (line 4). However, contrary to the authoritative controller, Ryan later applied a series of supportive, intrinsic scaffolding (e.g.,"Reduction in Degrees of Freedom" and "Direction Maintenance"). Specifically, he provided coaching comments (line 2 and 9) and posed open-ended questions (line 5 and 11) as the tools to simplify the revision tasks and motivate Louis in pursuit of the final goal. It needs to be noted that Ryan, as a collaborative reader, did not employ any directive, extrinsic scaffolding, like "Demonstration." Due to such intrinsic, strategic assistance, the writer "Louis", unlike "Jill" in Excerpt 4.14, could have the chance to recognize the troublesource and complete the revisions (line 8 and 13).

In sum, this chapter addresses the three research questions based on the statistical results and representative comments. In the following chapter, I will further discuss the findings of

the study. Then, I will summarize the study, acknowledge the limitation of the study, provide

pedagogical implication, and make suggestions for future research.

CHAPTER 5

DISCUSSION AND CONCLUSION

In this chapter, I will first discuss the findings of this study. Next, I will summarize the findings and indicate the study limitations, pedagogical implications, and suggestions for further study.

Discussion

The findings reported in Chapter 4 can be further discussed under the four themes: synchronous CMC as social milieu, patterns of interaction and regulation during on-line revision, mediated scaffolding during on-line peer revision, and non-scaffolding assistance.

Synchronous CMC as social milieu

According to Vygotsky (1962, 1978), the locus of learning is not exclusively within the individual's mind, but rather extends outside the learner, specifically within the interaction with other individuals. In other words, human higher mental development, in a sociocultural view, is tightly dependent upon the social milieu within which learning may take place. In this study, this specific social learning context was MSN Messenger– one of Microsoft's on-line instant messaging programs, via which the peers exchanged critical comments in order to help each other revise. However, it should be noticed that this synchronous messaging program in this study was not considered merely to be an electronic communication channel as demonstrated in most existing studies, but rather to be an alternative technology-enhanced social context where authentic dyadic interactions could be co-constructed by peers via instant communication. To further realize this specific synchronous CMC context, its emerging types of on-line interaction and its social impacts, whether positive or negative, will be discussed in detail in the following sections.

Types of on-line interaction in the synchronous CMC context

In this synchronous CMC context, the emerging interaction types were similar to those in face-to-face revision environments (e.g., de Guerrero & Villamil, 1994). Specifically, the participants, in such synchronous on-line revision sessions, stayed on-task for most of the recorded interactions, with only a few episodes dedicated to talking about the task rules or straying to unrelated topics (see Table 4.1). Also, the on-task episodes themselves were found to be highly varied in nature (see Table 4.2). That is, the participants not only engaged in interactive peer revisions as expected, but also made self-revision with non-interactive attitudes.

Nevertheless, unlike those in face-to-face revisions, the on-line reviewers and reviewees were noted to seek help through the Internet, due to their scarce chances of receiving assistance or guidance from a "real" teacher or tutor. Such actions of resorting to "virtual" experts not only gave rise to a new CMC facilitated reader/writer interaction ("Reader/Writer/Expert Interactive Revisions"), but also distinguished this on-line peer revising environment from the traditional face-to-face classroom context documented in the existing literature. Most importantly, it was also discovered that even within the interactive peer revisions, the patterns of idea exchange were diversified in nature. Generally speaking, such different patterns of idea exchange may be consistent with the three categories of social behaviors proposed by Villamil and de Guerrero (1996), namely, relinquishing/appropriating, respect for authorship/lack of respect for authorship, and struggle for authorial control/maintaining authorial control. These diversified social behaviors revealed in this study may result in the participants' the implicit, dynamic role awareness, which, on one hand, urged the student readers to actively initiate and maintain interactional control, and, on the other hand, left the student writers greatly dependent on their partners. Based on this investigation of a wide variety of on-task episodes as well as interactive peer revisions, the

results seem to confirm the assertions from previous studies about the complexity of peer interaction during revision (Gere & Abbott, 1985; Gere & Stevens, 1985; Nelson & Murphy, 1993; Warshauer, 1992), and seem to also identify the following positive and negative impacts of synchronous CMC towards the dyadic interaction.

Social impacts of synchronous CMC

In this study, the positive social impacts of synchronous CMC towards the dyadic interactions were the peers' increasing independence and self-confidence. As shown in the participants' instant conversation logs (see Excerpt 4.5 and 4.6), the peers, since having no real teachers or tutors to counsel, had only to find ways out by themselves. In other words, the CMC as the mediation for "virtual" experts, or more precisely for the source of scaffolding, promoted the spirit of autonomy by allowing the participants to search for information on their own and fostered peer participation by imbuing them with more self-confidence to doubt, to negotiate, and to express ideas. It was exactly such a desire to express and defend oneself that triggered further dyadic interactions and prolonged the on-line discussion. These results, in this light, corresponded to Lotman's (1988) statement that on-line discussion serves the role of "thinking device" (p. 36) and is thus of great significance for collaborative construction of knowledge. Moreover, they are also consonant with most of the findings documented in the literature that synchronous CMC is indeed empowered to foster either the quantity of language production (Chun, 1994; Kern, 1995; Warschauer, 1996) or the equality of peer participation (Chun, 1994; Gonzalez-Bueno, 1998; Kern 1995).

Yet, in spite of the well established literature on distance collaboration (e.g., Cummins & Sayers, 1995), the distance nature of synchronous CMC is to a certain extent found to hinder the revision processing. In the existing CMC literature, physical distancing is commonly considered to be the key factor that reduces the participants' pressure of facing authority and

that could create a non-threatening learning environment. However, in the present study, such distant idea exchanges via CMC surprisingly became the factor that distracted the participants from the revision works. Specifically, with less anxiety to come up with immediate answers, the peers were more likely to retard the whole revision processing by engaging themselves in other activities that were unrelated to revision. Such distraction, as shown in Excerpt 5.1 below, might eventually result in various short replies, incoherent idea exchanges, the partners' monologues, and finally the occurrence of non-interactive revisions.

Excerpt 5.1 (Revision Session 6) (Reader: *Cindy*; Writer: *Peter*)

1. Cindy:	Look at this sentence…"I am infatuate with Kreisler's music and most of his work."
2. Cindy:	infatuate is a verb.
3. Cindy:	u should add "d"
4. Cindy:	and "work" should add "s"
5. Cindy:	Hello?????
6. Cindy:	Is anybody there?
7. Cindy:	Do you know what I am talking about?
8. Peter:	Yes?
9. Peter:	I see

Beyond the issue of pros and cons, one more social impact of synchronous CMC observed in this study is its electronic variety of language. As Herring (1996) indicated, the language of CMC is typed and hence like writing, but it is exchanged rapidly and thus like spoken conversation as well. Corresponding to Herring's statement, the language the participants used in this synchronous CMC context was neither spoken nor written in terms of the conventional sense of speaking or writing. More specifically, the textual function of language used here was more similar to written language in terms of the vocabulary use. However, due to the purpose of reducing typing time, such an electronic written language also manifested various features resembling speaking, such as lack of capitalization (e.g., "*i*

think *english* is hard.") and absence of punctuation (e.g., the omission of the question mark in "Do you know how to revise it"). Moreover, on account of the absence of paralinguistic cues, the synchronous CMC language was also characteristic of abbreviations (e.g., "*u*" for you, "*ur*" for your, and "*thx*" for thanks), emoticons (e.g., @@ for dizziness, =D for a smiling face, *Orz* for an embarrassed person kneeling and touching the forehead to the ground), and even onomatopoetic devices (e.g., "*oh*"). Also, it is obvious that the participants tended to utilize these alternative communicative devices to compensate the lack of aural or visual cues in the "text" chats. Excerpt 5.2 below exactly shows this CMC language lying between the two extremes of speaking and writing.

Excerpt 5.2 (Revision Session 15) (Reader: *Wendy*; Writer: *Billy*)

1. Wendy:	it seems that u compare the two movies from the stories itself
2. Wendy:	themselves =D
3. Billy:	yes~
4. Wendy:	maybe u need key words
5. Billy:	haha…I think so…
6. Wendy	for example, compare the "ending"
7. Billy:	Oh thx~~ it is a good idea.~~
8. Billy:	it makes others read easier.
9. Wendy:	@@ yeahhaha 3Q

In addition, it is especially noted that some of the speech-like language in CMC was culturally shaped. For instance, the peers in this study were found to use such words as "3Q" (thank you), "haha" (hehe), "88" (bye-bye) and "OKla" (okay) to present their emotions. These words were partially or completely created with Chinese pronunciation and therefore displayed the specific cultural influence upon the participants. In a sociocultural stance, those Chinese-like pronunciations are culturally specific and thus reflected the essence of L1 as mediation. That is, L1 as one of the mediation tools originally created by humans would further help to organize the biologically specified brain into a higher, or culturally shaped,

mind through the integration of symbolic artifacts into thinking (Lantolf, 2000).

Regulation and patterns of interaction during on-line peer revision

In this study, different patterns of interaction and the social relationships that resulted from the participants' cognitive stages of regulation emerging in the on-line peer revisions were also explored. Consistent with the study of de Guerrero and Villamil (1994), the participants' particular behaviors might characterize each cognitive regulation. Generally speaking, self-regulated participants show greater independence in troublesource identification and problem solving. Such independence is also reflected in their attitude of self-confidence in terms of the content, language uses, and the ways of initiating interactions and providing scaffolding. Other-regulated learners are otherwise more uncertain about their revising actions; they are unable to undertake revision successfully on their own and hence often show the need for peer assistance. Yet, other-regulated learners are also seen to display better grasp of goals and improve control over the task after being guided and assisted. Unlike the self- and other-regulated participants, the object-regulated peers seem to be totally controlled by the rudimentary drafts and thus failed to engage in any constructive dialogue with their partners. Those aforementioned behaviors, in actuality, thed light on the nature of regulatory levels. That is, self-regulation suggests high self-assurance, leadership, and great willingness to share. Other-regulation suggests hesitancy, the need for help, and the potential progress under scaffolding. Object-regulation indicates the naive self-satisfaction, the learner distraction, the absence of dialogical interactions, and even the self-abandoning (de Guerrero & Villamil, 1994).

Moreover, through the observation, I also found that the participants' regulatory levels were never fixed, but were rather dynamic. More specifically, the participants' cognitive stages of regulation were seen to fluctuate according to their shifting awareness and attitudes towards the roles. As similarly reflected in the diversified social behaviors (see Excerpt 4.3

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and 4.4), the ways how the participants assumed their own roles would to a certain extent influence their cognitive stages of regulation. That is, the student readers, who tended to assume greater responsibility to pick over possible troublesources, were mostly self-regulated, while the writers, who tended to sit back waiting for guidance and directions, were therefore other-regulated or even object-regulated. In this sense, once the roles are shifted, the regulatory levels would also be altered.

Most importantly, it is found that different patterns of social relationships resulted from varied combinations of the peers' cognitive stages of regulation. As shown in Table 4.5, asymmetrical social relationships predominated in on-line interactive revisions. Moreover, within the asymmetrical relationships, the OTR/SER category was the most common. This prevalence of asymmetrical OTR/SER interactions, on one hand, once again suggests the potentially unbalanced power relationships between the readers and the writers due to their different, or even nearly opposite, role awareness. On the other hand, it also successfully recapitulates the Vygotskian idea of ZPD by creating a mutual activity frame in which the OTR participants carry out revision actions in conjunction with the assistance of the SER ones. Moreover, such a symbolic mutual activity frame, in this study, was found to be implemented in two distinct manners: collaborative and authoritative (see Table 4.7). The collaborative interventions were constructed by the self-regulated peers helping their less-regulated partners to understand the changes proposed with softened critical comments, and, therefore, were characteristic of dialogic on-line speech as well as the camaraderie and empathy. However, on the contrary, the authoritative interventions were constructed under the absence of negotiated process and thus were featured with monologues of the self-regulated peers and simple acceptance on the part of less-regulated partners.

Finally, it is edifying to note the significance of the external assistance in the participants' growth of cognitive regulation. As observed, different patterns of dyadic interaction form a continuum where at the optimal extreme the two self-regulated peers

identify and solve troublesources independently through a highly negotiated process, whereas, at the other extreme, the two objected-regulated peers are both stuck by troubles and fail to conduct any constructive communication. Yet, such symmetrical social relationships between two OBR and two OTR participants seem to be more ineffective, due to their limited abilities to scaffold each other. Hence, along this continuum, the key factor that pushes the participants to move from the basis (OBR/OBR), through the midpoint (OTR/OTR), and to the top (SER/SER) would be the behavior of resorting to "outside help" (de Guerrero & Villamil, 1994, p. 492). From the data, this "outside help" could be the assistance offered by the partners or the "virtual" sources, such as magazines, on-line dictionaries, translation programs, or any informative websites. With these scaffolding devices, the participants can gradually gain the impetus to expand the ZPDs and move forward to a higher degree of regulation. To further realize the relationships between the participants' regulatory levels and scaffolding received, the issue of mediated scaffolding will be further discussed in the following section.

Mediated scaffolding during on-line peer revision

As mentioned, the traditional line of sociocultural theorists contend that human cognitive development is a result of social interaction in which a less skilled individual can extend his/her current capabilities with the scaffolding provided by a more experienced or skilled individual. In other words, the expert has traditionally been believed to be the major social mediation via which the novice could move from the actual developmental level to the potential level of development in the ZPD. This belief could be well reflected in Donato's (1994) contention that social interaction is a mediation via which the novice can be drawn into, and operates within, the expert's strategic processes and thus result in individual cognitive development.

However, on account of the unique nature of this study, here I only examined peer

interaction, or more specifically peers as mediation, in on-line reviewing sessions. As previously indicated, Vygotsky's theoretical framework has recently been expanded and employed by a number of L2 researchers to investigate peer response activities during group work in second language writing classrooms (de Guerrero & Villamil, 1994; Donato, 1994; ; DiCamilla & Anton, 1997; Lantolf & Appel, 1994; Villamil & de Guerrero, 1996; Villamil & de Guerrero, 1998). Those positive results reveal the fact that "the speakers are at the same time individually novices and collectively experts, sources of new orientations for each other, and guides through this complex linguistic problem solving" (Donato, 1994, p. 46). In other words, expertise can also be collaboratively constructed via the positive dialogic mediation in which the peers may share the goals of working out a linguistically-based solution to a problem.

In this sense, it has been assumed that the peer mediation could be saliently embodied in the form of scaffolding behaviors. The investigation of a wide variety of peer scaffolding activities undertaken by the participants in revision identifies the previous characterizations of scaffolding mechanisms (Bruner, 1978; Villamil & de Guerrero, 1996, 2000; Wood, et al., 1976) to be a complex process involving a myriad of recursive behaviors. Indeed, as demonstrated in various reviewing sessions of this study, peer revision emerged as a collaborative, communicative experience in which the peers had not only to read and write, but also to learn various complex skills such as assessing, composing, copying, and even persuading. Through such collaborative dyadic interactions, I not only observed the six traditionally recognized scaffolding behaviors("Recruitment", "Reduction in Degree of Freedom", "Direction Maintenance", "Marking Critical Features", "Frustration Control", "Demonstration"), but also identified one new scaffolding type, "Sharing", which is unique to the optimal SER/SER peer interaction. These findings above showed that learners were capable of providing mutual support in ways analogous to expert scaffolding documented in the literature (Bruner, 1978; Lidz, 1991; Wood, et al., 1976).

Also, the findings, as the expansion of the second research question, showed that different patterns of scaffolding behaviors would be given according to the peers' different levels of cognitive regulation. This phenomenon was especially preeminent when one of the peers in a dyad was highly self-regulated and the other one was in his/her lower level of regulation (see Excerpt 4.12 and 4.13). This result, on one hand, is consonant with the finding of Ohta (2000) that learners might be sensitive to each other's ZPD and therefore would not provide scaffolding randomly. On the other hand, it implies the ways how peer feedback is negotiated in their ZPD in terms of the innate regulatory hierarchy (see Excerpt 4.12 and 4.13). That is, language learning as a kind of human higher mental activities may greatly rely on the mediation provided by other individuals, who co-construct their ZPD in consort with the learner dialogically. In this sense, feedback as regulation would become relevant and could, therefore, be appropriated by learners to modify their inter-language systems (Aljaafreh & Lantolf, 1994).

Similarly, different natures of scaffolding assistance would also be offered according to different interaction interventions. As shown in Excerpt 4.7 and 4.8, the OTR/SER interaction presented two subtypes of peer interventions, that is, authoritative and collaborative. Through the observation of the scaffolding assistance provided in these two interventions, the close relationships between the scaffolding types and the interventions were identified. Specifically, the authoritative student reviewers tended to apply more extrinsic types of assistance, such as "Demonstrating", to direct the revision process and results. On the contrary, the collaborative reviewers tended to use more intrinsic scaffolding, such as "Reduction in Degree of Freedom" and "Direction Maintenance", to help simplify the revision tasks and to keep their partners in pursuit of the final goals. This phenomenon might be further reinforced by the feedback of the reviewees. That is, the relinquishment of the reviewees in authoritative interventions might even reinforce the occurrence of extrinsic assistance, while great participation in collaborative interventions might eventually stimulate the occurrence of

intrinsic scaffolding. This finding once again confirms the strong correlation between the mediated scaffolding and the received feedback, as mentioned in the previous paragraphs.

The last significant phenomenon about scaffolding as mediation is the participants' L1. As shown in the peer interactions, the participants were observed to use Chinese, their L1, as the tool of mediation to make meaning of text (e.g., Excerpt 4.10), help retrieve words in the L2 (e.g., Excerpt 3.1), explore and expand ideas (e.g., Excerpt 4.11), guide the action through the task (e.g., Excerpt 3.2), and keep conversation going (e.g., Excerpt 4.13). As Excerpt 5.3 below further illustrates, the abovementioned purposes were all directed to reach the intersubjectivity (line 7 and 8), that is, a shared context established between the participants to facilitate communication and stimulate mutual agreement (Lantolf, 2000).

Excerpt 5.3 (Revision Session 7) (Reader: *Ryan*; Writer: *Louis*)

1. Louis:	你覺得這裡有要用過去式嗎？ [Do you think I should use the past tense here?]
2. Ryan:	我正想問你 [I am just going to ask you.]
3. Louis:	原本我寫的時候想說這是一個事實，所以我用現在式 [I originally thought it is a fact, so I used the present tense.]
4. Ryan:	但是你不覺得這比較像是在說過去的事嗎？ [But don't you think it is more like talking about something in the past?]
5. Louis:	對對對 所以我有覺得好像該用過去式 [Yes. Yes. Yes. So I am thinking that I should use past tense.]
6. Ryan:	還是把它想成是過去的事實？ [Or how about considering it to be the past fact?]
7. Louis:	過去的事實？嗯嗯~~ 我也覺得耶… [the past fact? Hmm. Hmm. I think so, too.]
8. Ryan:	那就用過去式好了 [Well, let's use the past tense.]

In addition, as shown in Excerpt 5.4 below, such extensive use of L1 might be due to the fact that the participants somehow understood their on-line dialogues would not be graded (line 4 and 5) and that Chinese, compared with English as their L2, was still a more practical

and effective tool for them to complete the tasks and achieve the goals (line 3). In actuality, this finding about L1 as mediation corresponds to the major sociocultural assertion-- the language as the "tool of tools" (Vygotsky, 1978, cited in Wells, 1994, p. 46) is the basis of human intellect. Moreover, it is also consonant with the research that demonstrates the ways how L2 writers use the native tongue to retrieve information from memory, generate content, and improve the quality of text (Friedlander, 1990; Lay, 1982).

Excerpt 5.4 (Revision Session 4) (Reader: *Iric*; Writer: *Jason*)

1. Iric:	有規定要用英文討論嗎？[Are we supposed to discuss in English?]	
2. Jason:	Of course not.	
3. Jason:	那樣可能很沒有效率 [If so, that will be very ineffective.]	
4. Iric:	老師沒有要求我們要用英文嗎？[Didn't the teacher ask us to use English?]	
5. Jason:	有嗎？她應該不會用這個來給分吧 [She did? She wouldn't grade us according to this, would she?]	
6. Iric:	Well…我們用中文好了 [Let's use Chinese.]	

Non-scaffolding assistance

In this study, it was also found that the participants would occasionally provide non-scaffolding assistance. Unlike scaffolding assistance that might move the peers forward to higher levels of cognitive regulation, the non-scaffolding assistance could solely be counted as the assistance that facilitates the completion of the revision tasks, but not the cognitive progress of the students. Excerpt 5.5 and 5.6 below represents an example of non-scaffolding assistance.

Excerpt 5.5 (Revision Session 7) (Reader: *Ryan*; Writer: *Louis*)

1. Ryan: 看一下第二段第一行的最後面…very like his play → like his play very much [Look at the end of the first line in the second paragraph…]
2. Ryan: 如果你是要說過去不喜歡的話…but i did not like… [If you want to say you did not like it in the past…]

3. Louis: 嗯 [Hmm]

4. Louis: 了解 [I see.]

5. Ryan: 嗯 [Hmm]

6. Louis: 那我把它改成 "but I do not like them at that time" 好了 [Then I'll correct it to "but I do not like them at that time".]

Excerpt 5.5 above is an episode which was featured by the reader's direct answer and the writer's phatic, hollow words. Specifically speaking, the reader (alias "Ryan"), since the very beginning, did not show any intention to guide the writer (alias "Louis") to be aware of his writing problem with strategic assistance. Instead, he just scaffolded his less-regulated partner in the most direct way; he directly pointed out the troublesource and provided the answer quickly (line 1 to 2). From the writer's short responses, such as "Hmm" (line 3) and "I see" (line 4), it seemed that such assistance might not scaffold "Louis" to reflect upon the imperfection or to retrieve correct answers (line 6). The following Excerpt 5.6 represents an even extremer example of non-scaffolding assistance.

Excerpt 5.6 (Revision Session 19) (Reader: *Wyn*; Writer: *Kitty*)

1. Kitty: Is there anything else I need to revise?

1.Wyn: …and I think you have to notice the tense problem.

2. Wyn: just like in the 2nd paragraph…

3. Wyn: "I admire my father since I was a little child."

4. Wyn: "I admire" → "I have admired"

5. Wyn: Another sentence…"I was full of curious and always asks 'why' and 'what' in my childhood."

6. Wyn: always asks → always asked

Excerpt 5.6 is the episode which was constructed solely by the reader (alias "Wyn"). It is clear that the writer (alias "Kitty") was not involved in this revision at all; she somehow just disappeared and even did not show any simple greeting or phatic words. In this case, whether the writer "Kitty" could make any cognitive progress would stay uncertain and even

pessimistic, since she seemingly was not offered enough opportunities to learn how to find troublesources, to notice the gap between the ideal and the problematic, and to solve and revise the imperfection. In this sense, she may have very little chance to integrate and internalize the newly learned knowledge, and therefore might stand an unfavorable position to make further cognitive progress. In other words, the assistance "Wyn" provided might not scaffold "Kitty" to move forward; instead, it aimed only for task completion.

In actuality, such an absolute unequal power/responsibility distribution might hardly be found in face-to-face peer revision environments due to the students' concerns of defending their partners and the necessity of maintaining and strengthening friendship. The possible reason for the unequal power relationship in the electronic context might be the physical distance between the peers. That is, on account of the physical distance, the students would be less sensitive to pressure from peers and, therefore, might show too direct assistance. Also, it should be noted that such extremely authoritative instructions would easily lead to non-scaffolding assistance, and would deprive students of chances to re-construct the knowledge system and to make possible progress in their cognitive development.

Conclusion

In this section, I summarize the study findings, acknowledge the study limitations, provide pedagogical implications, and make suggestions for future study.

The study utilized Vygotskian sociocultural perspectives to examine three writing cycles of L2 peer revision sessions throughout an 18-week, college-level writing course. To probe the nature of electronic peer interaction, I explored three sociocultural dimensions of peer revision via an on-line medium. Specifically, I explored the types of interaction occurring between members of a dyad, the kinds of social relationships emerging from the participants' cognitive stages of regulation, and the relationships between the participants' cognitive status and their received scaffolding.

The findings of the study showed that, in the synchronous CMC context, the participants not only engaged in five traditional on-task episodes (Woods, et al., 1976) that might also be seen in face-to-face revision sessions, but also created a new interaction type, namely, "Reader/Writer/Expert Interactive Revisions". Such a CMC facilitated interaction type not only revealed the participants' behaviors of recurring to "virtual" experts, but also distinguished the on-line revising environment as an alternative technology-enhanced social domain in which the peers co-constructed authentic, dialogic interactions, instead of purely conversing with each other through an electronic channel. Moreover, with the scaffolding of virtual experts, the peers were observed to be more active to respond, to negotiate, and even to defend themselves. Further, it is also found that the interactive revisions, inclusive of "Reader/Writer" and "Reader/Writer/Expert" Interactive Revisions", varied in nature due to the participants' implicit, dynamic role awareness. These diversified patterns of idea exchange manifested the fact of the implicit role shift and the situated learning environment in which different awareness would be formed and different types of interaction would happen.

In addition, I also identified symmetrical and asymmetrical social relationships emerging from the participants' different stages of cognitive regulation. Moreover, within the asymmetrical OTR/SER interaction, it was found that collaborative interventions, instead of authoritative interventions, predominated among the participants. As the best recapitulation of the Vygotsky's concept of ZPD (1978), the collaborative interventions revealed the peers' efforts to establish a working atmosphere in which the spirit of camaraderie and empathy would be generated and the tasks would be completed more easily. In addition, I also found that different cognitive stages of regulation were featured by the participants' particular behaviors and these cognitive statuses were never fixed. Corresponding to the first research question, such a dynamic cognitive fluctuation once again emphasized the significance of the role shift and situated awareness in peer revision. Furthermore, I noted the importance of

external scaffolding in the growth of cognitive regulation. Consonant with the findings in the first research question, the participants receiving scaffolding assistance were found to be more active and thus may stand a better chance to move along the continuum from the OBR/OBR to the optimal SER/SER stage.

Finally, I found a close relationship between the participants' regulatory status and the scaffolding received. Such assistance received included not only six traditional scaffolding types commonly used in tutorial sessions but also one specific scaffolding type ("Sharing") unique to peer interaction. It is noted that these various types of scaffolding assistance are offered according to the participants' different levels of cognitive regulation. Hence, asymmetrical social relationships stimulate the occurrence of directive, imperative scaffolding behaviors, whereas symmetrical social relationships foster the inductive scaffolding. This phenomenon was especially obvious in the two interventions embedded in OTR/SER interactions. That is, the intrinsic scaffolding would be predominant in the collaborative interventions while the extrinsic scaffolding would prevail in the authoritative interventions. Most importantly, I also extracted a new types of interaction -- non-scaffolding assistance -- from the aforementioned scaffolding assistance and indicated the possible causes and potentially unfavorable consequences on the part of the students.

Limitations of the study

The first limitation of this study is that this study focused exclusively on on-task episodes. Since the purpose of this study was to explore the sociocultural nature of peer interaction via CMC, I drew my exclusive attention on the on-task episodes, in which the participants were truly involved in dyadic discussion in order to identify writing troublesources and possible ways to solve them. In other words, the about-task and off-task episodes naturally remained ignored in this case. This may overlook some significant findings about the students' interlanguage performance and the interactive features occurring

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in the conversation unrelated to revision.

The second limitation is the limited size of the data. As mentioned, among all the six reviewing sessions were only three that were held among peers via on-line media. Moreover, on account of the fact that the students could choose to join either on-line peer revision or tutorial revision, the amount of data that were targeted to our study even shrieked. With such a limited size of data, I found it difficult to trace the participants' long-term developmental growth on the parts of cognitive stages of regulation. In other words, what I could capture was only some fragments of cognitive fluctuation; thus, I failed to draw a complete picture of the peers' developmental changes throughout the semester.

The last limitation lies in the lack of multiple data sources for triangulation. As noted, the results were solely based on the participants' instant conversation logs. In other words, the categorization decisions on the interaction types, the cognitive stages of regulation, the kinds of social relationships, and the types of scaffolding assistance were all made based on what I observed in the limited IM text data. Moreover, the lack of interviews deprived us of further chances to capture additional information about the participants' paralinguistic performance or perceptions towards revision. Most importantly, it suggests the lack of chances to further strengthen the reliability of the study. Such a limited source of data, as well as the lack of interviews, might therefore cause biases on our interpretation of the data.

Pedagogical implications

This study has informed us of several pedagogical implications that must be taken into consideration when L2 on-line peer revision is implemented. First, teachers, after being aware of the stimulating effect of "virtual" experts, should heighten awareness and open discussion about the implementation and advantages of the on-line scaffolding. As our study indicated, although the peers could collaboratively construct expertise, symmetrical interactions between two OBR or two OTR students still did not seem to be very effective. In

this case, on-line resources were observed to function as the facilitator or the backup that helped the students to express, to respond, and even to defend themselves. In other words, the "virtual" experts were able to, on one hand, assist the students to make progress within their ZPDs, and, on the other hand, help initiate and prolong the dialogic negotiation. To foster such CMC facilitated peer interactions, teachers need to guide students to familiarize with possible sources of and access to on-line scaffolding before revision sessions.

Second, teachers need to emphasize the merits and significance of peer mutual strategic behaviors. This study indicated a total of seven peer scaffolding behaviors and a close relationship between the peers' cognitive stages of regulation and the scaffolding received. In other words, the peers, especially the self-regulated ones, were able to provide appropriate scaffolding according to their partners' regulatory status. To further strengthen this positive relationship, teachers should train students, particularly those at the lower stages of other- and object-regulation, to be aware of those strategic behaviors that might contribute to successful scaffolding or other-mediation in revision.

Finally, teachers should provide students abundant opportunities to interact with peers of different cognitive stages of regulation. As shown in our study, the cognitive stages of regulation were rather dynamic and situated according to the peers' shifting self-identity and role awareness. Therefore, to foster successful self-exploration and other-mediation, teachers should encourage students to try different roles and interact with peers who are at different regulatory levels in revision sessions. In this way, peer revision may form a beneficial social context in which students learn to construct collaboration by not only regulating others but also being regulated by others.

In short, by employing the sociocultural theory, teachers and researchers would not merely broaden traditional cognitive perspectives on peer reviewing activities but offer a chance to glimpse the nature of on-line peer interaction and collaboration as well.

Suggestions for future research

Distinct from the studies examining the effects of peer revision, this study aimed to apply sociocultural theory to explore the nature of L2 peer interaction embedded in a synchronous CMC context. To further understand how L2 peer revision carries out the complex socio-interactive process involving a myriad of recursive behaviors, future research may find it useful to include interviews after each writing cycles during the data collecting procedure. This may not only expand our data sources but also further strengthen the reliability of the study, instead of interpreting the data only from the angle of the researcher. Most important of all, the interviews may also provide us further chances to capture additional information about something that could not be revealed in the recorded data, such as the participants' paralinguistic performance and their perceptions towards the on-line revision. Moreover, it is also suggested to have an even deeper examination on the parts of off-task and about-task episodes, which may help discover certain significant findings about the students' interlanguage performance and the interactive features. Furthermore, with the appearance and wide application of other cutting-edge CMC tools, such as "Skype" and videoconference tools for net-meeting, it may be worthwhile to use such sociocultural notions to further examine the aural and visual modes of L2 peer interaction. Such studies exploring peer interactions in other alternative social milieus will shed light on the research in relative issues and hence may help grasp a better picture about the nature of second language learning and teaching.

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APPENDIXES

Appendix A　Consent Form

<div align="center">參與研究計畫同意書</div>

同學你好!

　　本人為語言中心專任助理教授張靜芬,與英語教學所許祐熏同學及王信雲同學將進行一項針對大學生電腦中介溝通中的批判性思考與社會互動（critical thinking and social interaction in CMC）的研究計畫。本計畫將以網路討論、問卷和訪談方式進行,因此,如果你應允參加本項計畫,在這一學期中**你需回答一次的問卷、三次的網路討論、四次的同儕互評及一至二次的訪談**(均在下課時間進行,不影響你的上課權益)。**你的參與與否將不會影響到你修習這門課程 —「網路英語寫作」的成績及權益**;並且在學期結束前,你將收到一份精美的小禮物。

　　若你決定參加本項計畫,你所有訪談及問卷資料將會進行保密,除了本人及許同學和王同學,絕對不會有第三者知悉。如果你在參與的過程中,感覺不愉快或無意願繼續參與,可隨時提出中止。但你的熱情參與,將幫助我們英語教師了解大學部學生如何在電腦中介溝通中進行批判性思考和社會互動,因此,在此懇請你支持。

　　若你決定參與本項計畫,請在下方簽名處簽上你的全名,之後們將影印一份交由你個人保存,如果你在參與過程中有任何疑問或建議,你可隨時和我(cfchang@mail.nctu.edu.tw)或許同學(u891211@hotmail.com)或王同學(jillisunique0615@hotmail.com)聯繫。在此先感謝你的參與。

參與者姓名＿＿＿＿＿＿＿＿＿＿(正楷)＿＿＿＿＿＿＿＿＿(簽名)日期 ＿＿＿＿＿＿＿

張靜芬 ＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿ 日期 ＿＿＿＿＿＿＿

許祐熏 ＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿ 日期 ＿＿＿＿＿＿＿

王信雲 ＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿ 日期 ＿＿＿＿＿＿＿

Appendix B　Background Questionnaire

Questionnaire (# 1)

姓名：_____

同學你好！
這份問卷是用來瞭解你在電腦使用、英文學習經驗、英文寫作學習此三方面的實際情形。**問卷結果僅供研究參考，絕不私自對外公佈，且將不會影響到你修習「網路英語寫作」的成績及權益**。請同學依據自己實際的學習經驗，在適當的□打∨。謝謝您的參與和合作！（共19題）

第一部份：電腦使用經驗

1. 我是否擁有個人電腦？是□ 否□
　　　　　　　　可上網？是□ 否□
　　　　　　　　使用處所？計算中心□ 宿舍□ 其他 _____

2. 我的電腦程度：【可複選】
　　幾乎都不會□　會文書處理□　會上網找資料□　會BBS□
　　會MSN□　會網頁製作□　會程式語言□　會收發e-mail□
　　玩電腦遊戲□　其他 _____

3. 我是否曾利用網路聊天室聊天？
　　經常□　有時□　偶爾□　很少□　不曾□

4. 我是否曾利用網路回文章（如：BBS、論壇等）？
　　經常□　有時□　偶爾□　很少□　不曾□

5. 我的英文打字速度：
　　非常快□　很快□　普通□　很慢□　不會英打□

6. 我是否參加過以網路討論方式進行的課程？是□ 否□（回答「否」的同學，下題不必作答）
　　　　　　　　以何種語言討論？中文□ 英文□ 其他□（語言種類：_____）

第二部份：英文學習經驗

7. 我從何時開始學習英文？
　　0-3歲（進幼稚園前）□　　4-6歲（幼稚園階段）□　　7-12歲（小學階段）□
　　13-15歲（國中階段）□　　16歲以後（高中階段）□

8. 我是否曾參加過以下語言檢定考試？
　　全民英檢 □（初級□ 中級□ 中高級□ 高級□ 優級□）
　　　TOEFL □（《請註明 PBT/CBT/IBT 》分數：_____）
　　　　其他 □（請註明《考試名稱》與《分數》：_____）
　　　　皆無 □

9. 在過去的英文課中，英文老師是否曾用電腦輔助英文教學？
　　是□；（請用中文或英文簡單描述教學內容）

否☐

10. 我覺得自己的英文程度大概是在？(*請將對應英文程度的數字圈起來。)

【 1:很不好→ 2:不好 → 3:普通 → 4:好 → 5:很好 】

『聽』:	1	2	3	4	5
『說』:	1	2	3	4	5
『讀』:	1	2	3	4	5
『寫』:	1	2	3	4	5

第三部分:英文寫作經驗

11. 我過去寫英文作文的機會:

非常多☐ 很多☐ 普通☐ 不多☐ 非常少☐

12. 我覺得英文寫作:

非常困難☐ 困難☐ 普通☐ 容易☐ 非常容易☐

13. 我曾透過哪些途徑學習英文寫作？【可複選】

修課☐ （課程名稱:_____ ）

自習☐ （自習方式:_____ ）

求助於寫作諮商中心☐

其他_____

14. 在我的英文寫作過程中，我覺得最困難的部分是: 【可複選】

內容(content)☐ 組織(organization)☐ 文法(grammar)☐

單字使用(word use)☐ 技巧(mechanics)<如：拼字、標點符號>☐

其他(請用中文或英文簡單說明)_____

15. 寫作後，我自己是否會對文章進行修改(revision)?

經常☐ 有時☐ 偶爾☐ 很少☐ 不曾☐

16. 在我的寫作經驗中，自我文章修改對我幫助很大:

(*若自己從未修改文章，則此題不必作答。)

非常同意☐ 同意☐ 沒意見☐ 不同意☐ 非常不同意☐

17. 寫作經驗中，是否接受過同學（同儕）提供的意見(peer feedback)以供文章修改?

是☐ 否☐

18. 同學以何種方式提供意見以供文章修改？【可複選】

(*若從未接受過同儕回饋的同學，則此題不必作答。)

面對面☐ 回饋表☐ 非即時網路溝通（如：BBS、blog、E-mail等）☐

即時網路溝通（如：MSN、網路聊天室等）☐

其他_____

19. 在我的寫作經驗中，同儕回饋(peer feedback)對我幫助很大:

(*若從未接受過同儕回饋的同學，則此題不必作答。)

非常同意☐ 同意☐ 沒意見☐ 不同意☐ 非常不同意☐

本問卷已結束，謝謝您的作答!!

Appendix C   Peer Editing Sheet

WEB-BASED ENGLISH WRITING

SPRING, 2006

PEER EDITING SHEET

Writer: _____

Reviewer: _____

Evaluation items	Needs work	Good	Out-standing
CONTENT AND ORGANIZATION:			
1. Does the topical sentence clearly state the major theme of this writing?			
2. Are the controlling ideas precise, specific, and adhered to topic?			
3. Are there enough supporting ideas to develop the paragraph(s)?			
4. Do the transitions help connect the ideas in a logical and easy-to-follow way?			
5. Does the concluding sentences sum up the main ideas or restate the main ideas in different ways?			
6. Are unfamiliar terms explained or defined?			
LANGUAGE USE			

1. Grammar is correct
  ▪ Subject-verb agreement
  ▪ Fragments
  ▪ Run-ons (sentences joined incorrectly)
  ▪ Verb forms and tense
  ▪ Pronoun
  ▪ Articles			

2. Spelling is correct.			
3. Word choice is appropriate.			
4. Connecting words are properly used.			
※ Indicate any sentences you don't understand:			

※ Overall, which part of the writing you like most? Why?

※ Which part needs to be improved?

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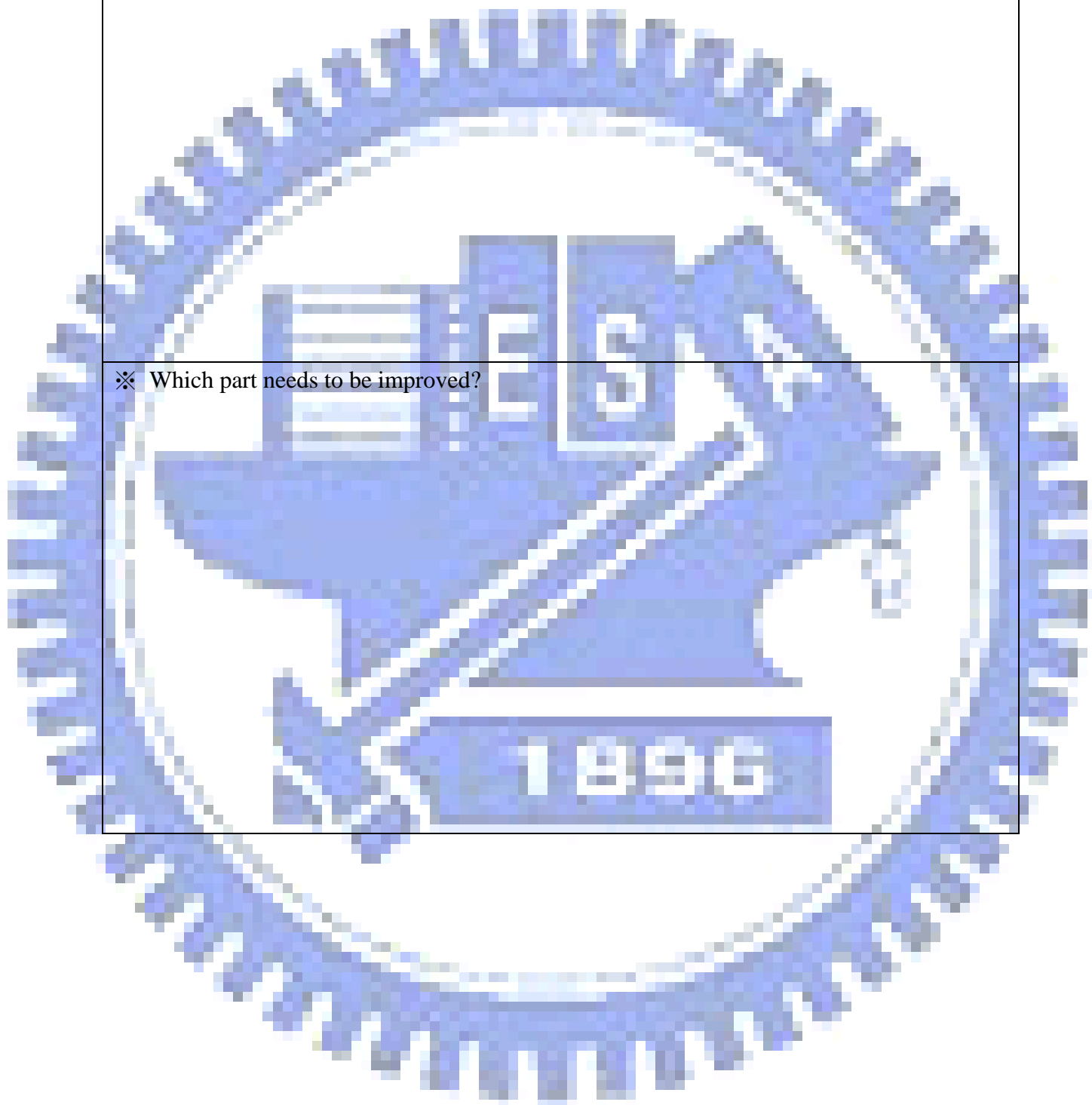
Appendix D   Types of Episodes

ON-TASK EPISODES: an utterance or group of utterances semantically related in topic or purposes to one discrete troublesource or a series of connected troublesources (as in the case of several errors within one sentence). An on-task episode may be interrupted and continued later in the course of the interaction.

ABOUT-TASK EPISODE: a segment of conversation in which the participants talk about task procedures, for example, interpreting task instructions, rather than about specific troublesources.

OFF-TASK EPISODE: a unit of discourse in which the participants are not engaged in revising a troublesource and are talking about issues or aspects of their lives unrelated to the content of the composition.

Appendix E   Types of On-Task Episodes

- **Reader/Writer Interactive Revisions:** episodes in which both reader and writer discuss revision of a troublesource.
- **Reader Noninteractive Revisions:** episodes in which the reader talks about how to revise a troublesource without the writer's intervention.
- **Writer Noninteractive Revisions:** episodes in which the writer talks about how to revise a troublesource without the reader's intervention.
- **Reader/Expert Interactive Revisions:** episodes in which the reader consults the expert about some type of revision. The learner may initiate the interaction after calling the teacher deliberately (or the teacher may start the talk as he/she goes around) or surfing the Internet to search for useful electronic resources.
- **Writer/Expert Interactive Revisions:** episodes in which the writer consults the teacher about some type of revision. The learner may initiate the interaction after calling the teacher deliberately (or the teacher may start the talk as he/she goes around) or surfing the Internet to search for useful electronic resources.
- **Reader/Writer/Expert Interactive Revisions:** episodes in which both reader and writer discuss revision of a troublesource with the assistance of the expert. The revision discussion of a troublesource may be initiated or continue after the learner calls the teacher deliberately (or the teacher may start the talk as he/she goes around) or surfs the Internet to search for useful electronic resources.

Appendix F   Cognitive Stages of Regulation

OBJECT-REGULATED   **CODE: OBR**

* The learner is controlled by the draft. He/she is bound by the words in the text he/she has produced and cannot see ways in which to improve it.
* The learner has an inadequate or incomplete grasp of the goals of the revision task; in other words, he/she fails to understand that the overall purpose of the revision session is to improve the text.
* The learner does not have the language and rhetorical knowledge necessary to carry out the task nor the procedural strategies to attempt revision.
* The learner is "satisfied" with his/her rudimentary first draft.
* The learner does not respond to prompts for revision made by a peer and his/her attention is easily distracted by away form the task.
* The learner's participation may be limited to uttering senseless monosyllables, echoing peer's comments, laughing, or joking.
* The learner gets "stuck" with a trouble source. He/she does not know how to solve   it, but keeps going in circles around it without making any progress.
* There is an absence of questions on the part of the learner.
* The learner does not engage in any constructive dialogue with the peer that will lead to improvement of the text; that is, there is no inter-psychological functioning directed towards solution of the task.

OTHER-REGULATED   **CODE:OTR**

*The learner lets himself/herself be guided by a peer during the revision task. The peer provides strategic assistance, or "scaffolding," for the learner to advance towards completion of the task.
* The learner does not yet have a complete grasp of the task goals and is unable to undertake revision on his/her own initiative but can achieve a certain degree of control over the task thanks to peer assistance.
* The learner may recognize trouble sources when pointed out by peer and may even ask questions on how to solve them but will mostly allow himself/herself to be led through the task by the peer or the professor.
* The learner may accept suggestions for revision from peer or professor but sometimes problems in communication may arise due to the learner's limited understanding of the task situation or knowledge of the language.
* Other-regulation from the more knowledgeable peer may come in the form of subtle hints and prompts, but sometimes there will be a more authoritative attitude form the peer/teacher.

* The learner may simply comply with or acquiesce to the peer's suggestions, with or without understanding, or may engage himself/herself in a more collaborative effort towards making meaning. This will be an indication of progress within the zone of proximal development to a more self-regulated level of development.
* In collaborative other-regulation, there will be an inter-psychological effort to solve the text with dialogue as the chief tool to achieve intersubjectivity.

SELF-REGULATED   **CODE: SER**

* The learner is capable of independent problem-solving. He/she can identify trouble sources in the text, initiate revision, and provide alternatives for the text.
* The learner has internalized the task requirements and has a clear vision of the goals to achieve.
* The learner's attitude is one of self-confidence in terns of content, language use, task goals, and procedures.
* The learner is capable of guiding revision process and providing scaffolding to less regulated member.
* Prompts by peer are dealt with quickly and efficiently with little negotiation (because the learner already knows the answer) or firm rejection (because the learner consider suggestion inappropriate.)

Appendix G   Social Relationships

Symmetrical Peer Interaction   **Code: SYM**

Symmetrical peer interactions are situations in which both participants are self-regulated, other-regulated, or object-regulated.

- **SER/SER:** In the optimal symmetrical situation, both individuals are self-regulated, and each recognizes and respects the other's private would. Both feel free to present their views for the creation of meaningful text. The opposite of this is symmetrical relationship, characterized by clashes or disagreements, in which both participants are self-regulated but intolerant of each other's views.
- **OTR/OTR:** In a symmetrical situation in which both participants are other-regulated, none of them can complete the task successfully on their own but may provide some scaffolding to each other. Results are, therefore, somewhat erratic due to the learners' limited rhetorical or linguistic knowledge: the learners may (a) settle on a solution which satisfies them both even if not completion, (b) recur to outside help for task completion, or (c) simply abandon the task.
- **OBR/OBR:** In a symmetrical situation in which both participants are object-regulated, neither participant understands clearly the purpose of the task or has the necessary language and rhetorical skills to perform appropriately. Both participants are controlled by the draft; in other words, they cannot remove themselves from the text in its first draft shape and do not make any progress towards improvement.

Asymmetrical Peer Interaction   **Code: ASYM**

Asymmetrical interactions are situations in which each participant is at a different level of regulation. There are three types of asymmetrical interactions: other- vs. self-regulated, other vs. object-regulated, and object- vs. self-regulated.

- **OTR/SER:** Other- vs. self-regulated interactions present two types of peer interventions: authoritative and collaborative.
- → In *authoritative* interventions, the views of the self-regulated participants are promoted at the expense of the other-regulated member, the self-regulated participant controlling the task. This interaction may result in the self-regulated member appropriating the text and making revisions on his/her own without consulting peer. A domineering attitude from the self-regulated member may lead to personality clashes or absence of negotiation between the partners.
- → In *collaborative* interventions, the self-regulated participant tries to see the text through the eyes of the author in order to help him/her achieve the task goals. This is the typical situation characterized as "zone of proximal development." In it, the self-regulated member of the dyad becomes a strategic assistant who provides scaffolding to the

other-regulated member and promotes transitions towards self-regulation.

- **OTR/OBR:** In the other- vs. object-regulated type of interaction, the other-regulated member needs assistance and may give indications of such, but the object-regulated member is unable to provide help. As a consequence, troublesources are either neglected or abandoned.
- **OBR/SER:** In the object- vs. self-regulated type of interaction, the self-regulated member takes the lead in revision while the object-regulated learner does not make any effort towards text improvement.

Appendix H   Scaffolding Functions

- **Recruitment:** enlisting the learner's interest in the task
- **Reduction in degree of freedom:** simplifying the task
- **Direction maintenance:** keeping the learner motivated and in pursuit of the goal
- **Marking critical features:** highlighting certain relevant features and pointing out discrepancies between what has been produced and the ideal solution
- **Frustration control:** reducing stress and frustration during problem solving
- **Demonstration:** modeling an idealized form of the act to be performed by completing the act or explicating the learner's partial solution
- **Sharing:** sharing and respecting each other's personal world