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Effects of Computer-mediated Communication (CMC) on Learner's Language Production and Attitude towards Oral Communication in Japanese

by

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Abstract

This study deals with the role of computer-mediated communication (CMC) in second language acquisition. While a number of previous studies have reported the positive effects of CMC on language production and attitudes towards communication, most of them measured the effects only within the CMC environment. Following Abrams (2003), I examine whether the CMC benefits are observed in the subsequent oral communication. Twelve learners of Japanese participate in five discussion sessions in CMC and face-to-face (F2F) settings. There are no statistically significant differences in language production or attitudes towards oral communication between the learners who participate in CMC sessions and those in F2F sessions. Overall, no evidence is found to indicate learner's CMC experiences help improve their performance and attitudes in the subsequent oral communication. The results in this study advise prudence in generalizing the effect of CMC in less commonly studied contexts and call for systematic examinations of different variables.

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Chapter 1: Introduction

1.1 Overview

This study investigates the effect of computer-mediated communication (CMC) on learners' oral language production and on their attitudes towards oral communication in Japanese. Previous studies have claimed that CMC helps learners improve language production and affective status, but its impact on oral language production has not been well documented. Abrams (2003) is one of the few studies that systematically examined the transferability of the CMC benefits to learners' oral performance. In this study, I generally follow Abrams's research design to evaluate claims by previous studies and further determine whether learners' CMC experiences help improve their performance and attitudes in the subsequent oral communication. This study also addresses the gap in the CMC research where the role of CMC is even less documented in the case of non Indo-European languages like Japanese.

There are several reasons to regard CMC as a promising new tool for language learning. First, CMC creates a setting that is similar to face-to-face (F2F) oral communication, but without the competition associated with turn-taking. Similarly, CMC is expected to reduce stress and anxiety frequently felt by learners in a F2F setting. It is, however, a matter of debate whether CMC, the majority of which is text-based in the current stage of computer technology, could be regarded as an extension of oral communication.

In fact, the effectiveness of CMC in improving learner's oral proficiency is yet to be demonstrated. The positive effects of CMC have been reported mostly within a CMC environment (e.g. Warschauer, 1994). That is, previous studies reporting

linguistic and affective improvements in the CMC environment have not directly examined whether these improvements in a CMC environment can be also achieved in F2F oral communication. If CMC is to prove its effectiveness in second language classrooms, it is important to show its benefit in F2F oral communication. To address the gap in the literature, this study compares oral language output of intermediate-level Japanese learners before and after their participation in synchronous CMC discussions. In particular, I examine whether learners' CMC experiences result in any measurable difference in the quality of language output and in their attitude towards oral communication in Japanese.

1.2 CMC and Second Language Acquisition (SLA)

The rapid technological developments in the past two decades have provided language educators with a wide array of computer tools and programs to enhance language learning. Educators have actively explored the potential of these new evolving media and computer-assisted language learning (CALL) has shown robust development. However, as Hatasa (2003) argues, the bid to integrate new computer programs into language instruction has been largely motivated by technology rather than by pedagogical imperatives. Scholars, such as Chapelle (1998) and Levy (1997), call for theoretically grounded evaluations of CALL and suggest looking into SLA theories for guidance. The research field of CMC is no exception to this impetus. There is now a growing body of research that attempts to examine the role of CMC within the framework of SLA theories. Of particular relevance to CMC studies are the interactionist theory (e.g., Gass & Varonis, 1994) and the negotiation of meaning hypothesis (e.g., Long 1996).

The interactionist theory maintains that conversational interactions play an important role in the development of second language. The emphasis on interactions starts with the hypothesis that learners need to comprehend, both syntactically and semantically, linguistic input before they can acquire it. Input, once comprehended, becomes intake. In order to enable this transformation of input into intake, the linguistic forms of input – whether lexical, morphological, syntactic, or semantic – needs to be noticed first (Schmidt, 1990). Therefore, to create "conditions directing learners' attention to linguistic form during tasks requiring meaningful language use" (Chapelle, 2001, p.47) is particularly important to promote the acquisition of the target language. Some SLA researchers believe that interactions readily provide the condition wherein attention is directed to linguistic features of utterances. Although the effort to identify what facilitates SLA is an ongoing one, recent studies seem to agree on the particular importance of interactions in SLA (Hegelheimer & Chapelle, 2002).

Interactions provide ample venues for *negotiation of meaning* – a process also believed to facilitate SLA (Long, 1996). Negotiation of meaning occurs when communication is interrupted during interactions. A communication breakdown shifts learner's attention from the meaning of the message to linguistic forms that caused the communication interruption. The learner then signals to the partner to indicate that there is a communication problem. In response, the partner attempts to fix the problem by modifying his/her utterances. In other words, learners *negotiated* with each other for the meaning of the original message through requests for interactional modifications on the one hand, and for the modified output as responses to these requests on the other. The process of meaning negotiation helps learners internalize what Krashen (1985) calls

comprehensible inputs – the utterances that are slightly beyond their comprehension level, but are made comprehensible by additional contextual clues, modifications applied to the original incomprehensible form, or modeling demonstrated by the partner. It also encourages learners to produce what Swain and Lapkin (1995) term as comprehensible output – the utterances that are modified to get their messages across. In the end, the process of meaning negotiation, including the production and comprehension of modified input and output, is regarded as essential in SLA since it helps learners stretch their language capacity as well as internalize new language forms.

CMC is believed to provide learners with ample opportunities for interactions and negotiation of meaning. One way to determine whether interactions truly take place in a CMC environment is to examine the communication logs recorded on a computer. A procedure commonly employed by researchers is to assign codes to the recorded utterances based on discourse analysis protocol. Then, the researchers look for codes that indicate occurrences of negotiation of meaning. The CMC studies that follow this type of procedure seem to favor a negotiation model proposed by Gass and Varonis (1994). According to their model, an occurrence of negotiation can be identified by four types of utterances: trigger, signal, response, and reaction to the response. A *trigger* is an utterance that includes the problematic form, thus triggering the whole process of negotiation. It is followed by a *signal*, an utterance that indicates a communication problem, as in "I don't understand", and then, a *response*, an utterance which attempts to address the problem, often through modifications. Optionally, a *reaction to the response* may signal the closure of negotiation. CMC researchers, such as Pellettieri

(2000) and Blake (2000), confirm the occurrence of these utterances, and highlight the potential of CMC in promoting SLA.

1.3 Computer Use in Japanese Language Teaching

According to Harrison (1998), the use of computer technology in Japanese language teaching was both delayed and limited in scope till the early 1990s due to the technological difficulties in the processing of Japanese characters. There was a problem of incompatibility between different computer platforms in encoding Japanese characters, which made it difficult to share information across users. For example, e-mail messages written in Japanese on one machine frequently became corrupted and turned into illegible symbols when sent to a computer with a different operating system. The problem of incompatibility in encoding Japanese characters gradually diminished as Internet application software and programming languages for web pages became standardized, thus opening up possibilities for greater use of CALL in Japanese teaching.

Computers, however, are primarily used as tools to deliver drill practice with little contextual relevance in many CALL programs. As Harrison (1998) states, use of computers as agents to carry out meaningful language tasks is not as widespread as their use as drill machines, suggesting similarly limited use of CMC in Japanese classrooms. Although the use of computers has increased over the last decade, as shown by Hatasa (2003), in a preliminary online survey of 20 Japanese instructors conducted in 2004 on the use of CMC, I found that CMC was still underused in Japanese classrooms (Kobayashi, 2004). Sixty percent of the respondents (12 instructors) indicated that they had used e-mail as part of instruction in class. Only one instructor had tried online chat and three had tried online discussion boards in their Japanese instructions. Despite the

strong interest in using CMC expressed by the respondent instructors, actual usage was still low, particularly in chat forums and discussion boards. The discrepancy between interest and actual use of CMC in this small sample suggests that CMC has not yet been given a chance to demonstrate its full potential in Japanese language teaching.

The number of studies on the effect of CALL on Japanese learning is also relatively small (Hatasa, 2003), no doubt as a result of limited CALL integration into Japanese classrooms. Felix (2005) conducted a comprehensive overview of recent research on CALL effectiveness and found that only five Japanese CALL studies out of 52 studies, compared to 16 studies on English, 14 for French, and 15 for Spanish. Studies that specifically investigate the use of CMC in Japanese language classrooms are also limited. Although the existing CMC studies on Japanese language learning suggest that a CMC environment supports negotiated interactions, which is an essential step towards foreign language acquisition, no studies to date have examined the effect of CMC on the development of learner's oral skills and positive attitude towards oral communication in Japanese language.

It is unfortunate that research on computer use in Japanese language instruction remains relatively sparse despite the popularity and strategic importance of the language. Thanks to numerous attractive qualities of Japan and its culture, ranging from pop music to tea ceremony to technology, Japanese language courses continue to draw a large number of learners. In the case of Canada, it is being offered at many schools and post-secondary institutions with steady enrollments. The language also holds a strategic importance for Canadians because Japan has been one of Canada's top trading partners

for many years. The potential of computer technology and CMC in promoting the learning of this important language needs to be actively explored.

1.4 Goals of the Study

Despite many potential benefits of CMC to language learners suggested by previous studies, it is still not clear how experiences with CMC could influence a learner's oral language production and affective state during F2F communications because most of the reported benefits were based on observations exclusively in a CMC environment, or on comparisons between the discussion data produced in a F2F setting and those produced in a CMC setting. In addition, there are very few studies that investigated the effects of CMC on Japanese language learning.

An important facet of examination in this study, then, is to establish that CMC benefits to Japanese learners are not limited to a CMC environment alone, but are transferred to their performances in F2F settings as well. In examining the degree to which language facility in a CMC environment crosses over to a F2F setting, this study will focus on the two aspects: First, it aims to see if learners' CMC experiences affect their language production in an ensuing F2F oral communication; second, it also investigates the effect of CMC on learner attitude towards oral communication.

1.5 Outline of the Thesis

This thesis is organized as follows: in Chapter 2, I first introduce two early studies in CMC research, namely the studies by Chun (1994) and Warschauer (1996), which lay the groundwork for subsequent studies. I then present the findings of previous studies that support linguistic and affective benefits of CMC in language learning, while pointing out the scarcity of research on the transferability of CMC

benefits to the ensuing oral communication. Chapter 3 provides detailed discussions of the study design and procedure. In Chapter 4, I report the results of the quantitative and qualitative analyses on learner's language output and affective state. In Chapter 5, I interpret the results and discuss the significance and limitations of the present study as well as the pedagogical implications of the findings of this study. In Chapter 6, I conclude by making suggestions for future work.

Chapter 2: Literature Review

Studies that investigate the role of CMC in language learning are on the rise as the earlier technological difficulties have been overcome and the use of CMC has increased in language classrooms. The extant studies report various positive effects of CMC in language learning, ranging from improved language output to positive change in affective state.

2.1 Two Founding Studies: Chun and Warschauer

The 1994 study by Chun and the 1996 study by Warschauer laid the groundwork for the field of CMC research. Both studies are important in that they established definable goals and made a disciplined approach to their investigations. Both also focused on linguistic and affective benefits of CMC to language learners. Though not free from shortcomings, these studies provide a starting point in the developing field of CMC studies.

2.1.1 Chun's (1994) Study

Chun (1994) is one of the first studies to show that CMC may be beneficial to language learners. It intended to determine whether CMC could facilitate the development of learner's communicative proficiency. To that goal, Chun collected and analyzed learner interaction data generated in the Computer-Assisted Class Discussion (CACD), a form of CMC. Her examination had two focal points. First, she probed the quality of CMC discourse. More specifically, she examined the number and type of different discourse functions that appeared in the CMC discussion. In addition, she also examined the syntactic structures of learner utterances. Second, she observed learners' participation patterns by counting the number and length of each learner's turn.

CMC discussion data were collected from a beginner-level German class in an American university over the course of two semesters. There were 14 participants in the first semester and 9 in the second; 8 participants out of the 9 in the second semester were continuing students from the first semester. In each CMC session, the participants conducted an online discussion on a topic that was provided by the instructor at the beginning of the session. There were five and nine discussion sessions held in the first and second semesters respectively, with the duration of 15 to 20 minutes for the first semester and 20 to 45 minutes for the second. The CMC discussions were conducted with a program called *InterChange*, which enabled real-time, synchronous communication in a networked environment. The discussion logs were saved on the computer and used for the later analysis.

The analysis of the online discourse indicated that the learners had demonstrated functional competence in the target language. More specifically, the learners were observed incorporating a wide variety of discourse functions in their CMC interactions, including greeting, initiating and responding to simple statements, and asking and answering questions. In addition, the learners resorted less to their first language, English, in the CMC discussion than in regular small-group or pair activities in a F2F setting. Although the learners occasionally used an English word or phrase when they did not know the German equivalent, they never used a complete English sentence during the discussion sessions.

The learners also exhibited interactive competence, defined by Kramsch (as cited in Chun, 1994) as "the ability to express, interpret, and negotiate meanings". The learners answered almost all questions raised by both the instructor and peer learners

during the CMC session. Not only did the learners respond to others' questions, they also took initiative in asking questions, giving feedback to others, expanding on the topics, and requesting clarifications. Chun contends that "students were reading everything that was produced and were processing, comprehending, and interpreting a tremendous amount of input" (1994, p.23). She also reports that the syntactic complexity of learner entries improved in the CMC environment. The ratio of complex sentences to simple sentences improved from one-to-three to three-to-four over the course of two semesters.

Learner's participation pattern was different between a CMC environment and a F2F environment. The learners who were usually quiet in the class tended to be one of the most vocal ones in the CMC discussions. These shy learners, who were evidently eager to participate in the CMC discussions, made many entries ranging from 9.0 to 17.8 entries per 20-25 minute session, where the number of entries made by all the participants ranged from 2.8 to 17.8 entries. The length of the entries varied from learner to learner, ranging from one sentence to a paragraph, which Chun argues indicated the different communicative styles of individual learners. CMC appeared to encourage different communicative styles of learners to flourish since it does not create time or psychological pressure for learners to carve their utterances as in a F2F environment.

Chun also contends that the CMC environment facilitates strong learner initiative in the discussions. Compared with a regular in-class discussion where the learners are given detailed and more restricting instructions, CMC discussion allows learners almost free reign over how to carry out the discussion. The learners in Chun's

study were only provided with a start-up topic at the beginning of the session. In the end, increased learner-to-learner interactions were observed.

The findings of Chun's study suggest that CMC has a positive bearing on learners' interactive and participatory styles, language output, and turn management. The findings of Chun's study, however, require additional validation for the following reasons. First, the study, which was conducted over the course of two semesters, fails to address the possible confounding effect of progressive learning. For example, the increased use of complex sentences observed in the CMC may well be explained as the result of continuous learning in class. Second, the study lacks the equivalent F2F oral data for comparison. Despite Chun's suggestion that CMC is instrumental in increasing learner-to-learner interactions, without the comparable oral data, it is unclear whether the increase in learner interactions was a unique phenomenon triggered by CMC. Although Chun presents, as a support to her claim, a generalized report on a regular in-class situation in which many of learner messages are directed to the instructor, the report must be treated as anecdotal. If a claim over a specific effect of CMC is to be verified, discourse data from CMC and comparable oral data need to be compared.

2.1.2 Warschauer's (1996) Study

Warschauer's (1996) study improves on the limitation of Chun's (1994) study by systematically comparing the student discussion data produced in a F2F setting with that produced in a CMC setting. There were three research questions addressed in Warschauer's study. First, it examined the effect of CMC on learner's participatory pattern. More specifically, it aimed to determine whether learner participation was more equally distributed in online discussions than in F2F discussions. Second, the study

examined the effect of CMC on learner's affective state, by comparing learner attitude towards communicating in the target language in a CMC setting and in a F2F setting. It also examined the effect of CMC on learner's language production by investigating whether the CMC discussions produced more lexically and syntactically complex language than the F2F discussions.

The participants of Warschauer's study were 16 advanced-level ESL learners in a community college in Hawaii. They were randomly divided into groups of four, and participated in a total of four rounds of discussions, two in CMC and the other two in F2F settings. The discussions were conducted on the topics familiar to the learners. Each discussion session lasted for about 15 minutes. All four sessions were held in one class sitting. The F2F discussions were later transcribed and compared with the log of CMC discussions for both quantitative and qualitative analyses. In addition, pre- and post-study surveys enquired learners of their self-assessments on language abilities and attitude towards online and F2F discussions. The results of the survey were to determine whether the variables, such as learners' language proficiency and attitudes towards different modes of discussions, affect their participation patterns.

Warschauer reports that the discussions were more evenly distributed among the participants in the CMC mode than in the F2F mode. For example, in one group, there was a large gap between the most actively participating learner and the least active one in a F2F discussion. The most active learner dominated the floor 49.6% of the total discussion time while the least active one took the floor mere 0.8%. This gap drastically narrowed in a CMC discussion. The participations were more evenly distributed among the learners, ranging from 27.7% to 21.8%. The learners also expressed their preference

of CMC environment as a discussion venue wherein they feel that they could express themselves more freely, comfortably, and creatively, with less stress.

Warschauer also found that CMC discussions produced more complex language than F2F discussions. Warschauer gauged the complexity of learner language with two measures, type-token ratio (TTR) and coordinate index (CI). The former measured lexical complexity, or the degree to which a learner employs varied vocabulary, whereas the latter measured syntactic complexity, or the degree to which a learner employs complex sentence structures. The TTR and CI scores revealed that the language used in the CMC discussions were, both lexically and syntactically, more complex than in the F2F discussions.

Warschauer's study provides strong support to the claim made in Chun's (1994) study that online discussions solicit the use of more complex language than F2F discussions.

2.2 CMC and SLA Facilitation

It is important to establish the effectiveness of CMC in facilitating SLA before incorporating it into language classrooms. Researchers have embarked on this endeavor and such studies as Pellettieri (2000), Blake (2000), and Kitade (2000) demonstrated the capacity of CMC in providing increased opportunities for SLA. These studies typically have attempted to demonstrate that CMC provides opportunities for negotiation of meaning, which is an ingredient of SLA as discussed in the section 1.2. They turned to CMC logs and analyzed the discourse produced in a CMC environment to see if the negotiation of meaning occurred.

One example of discourse-analysis based research is Pellettieri's (2000). The participants of her study, 25 learners of intermediate-level French, worked in pairs to collaboratively complete a set of language tasks using online chat. Pellettieri examined the discourse logs based on a coding scheme proposed by Gass and Varonis's (1994), and confirmed the occurrences of the four types of utterances, the hallmarks of negotiation of meaning. Communication troubles were identified with *trigger* and *signal* utterances, efforts were made to resolve the troubles through *response* utterances, and successful negotiation and re-established communication were indicated by *reaction* utterances. Negotiations focused on both meaning and the linguistic forms of learner utterances. Based on her findings, Pellettieri concluded that negotiation of meaning does occur in a virtual environment as in a F2F oral communication.

The study by Blake (2000) corroborates Pellettieri's claim. The goal of his study was two-folds: It aimed to identify incidents of language modifications, which typically occur in the process of negotiation, in a CMC setting; on the other hand, it attempted to analyze the linguistic characteristics of such modifications. The participants of his study, 50 intermediate-level Spanish learners, were divided into pairs and instructed to collaboratively complete a set of language tasks using an online chat program. One-hour-long chat sessions were held once a week. Blake found that negotiation of meaning did occur in CMC and that they followed typical negotiation moves, namely trigger, signal, response, and reaction. Linguistically, most of the negotiation incidents were caused by lexical miscommunications. Blake points out that CMC removes time and place constraints, thus making it possible for learners to engage in interactions "not only more frequently but also at any time of the day or night" (p. 132).

Kitade (2000) provides further confirmation of the claim that CMC supports negotiation of meaning, and highlights additional aspects of CMC that promote SLA. Kitade conducted a qualitative examination of learner discourse in online chat to determine the potential benefit of CMC in facilitating Japanese language acquisition. The participants, 15 learners of Japanese and 3 native speakers, were divided into four groups. Over the course of six weeks, each group participated in a weekly 50-minute chat session, during which learners conducted discussions to decide on various aspects of the assigned project. After a qualitative analysis of CMC discourse data, Kitade confirms that CMC supports negotiation of meaning. She also shows that CMC facilitates collaborative learning among learners and increases learner-centered interactions. Based on these findings, she concludes that certain linguistic and interactional features of CMC can provide learners with additional learning opportunities.

To sum up the existing research, CMC has been found to increase opportunities for interaction and negotiation of meaning, thus confirming the potential role of CMC in promoting SLA. In the next section, I will then identify the areas in which CMC excels in enhancing language learning.

2.3 CMC Benefits

The studies by Chun (1994) and Warschauer (1996), and many others suggest that CMC benefits language learners in two areas; linguistic skills and affective changes. Linguistically, CMC is reported to lead to an increase in the amount of learner language output (Abrams, 2003; Chun, 1994; Kern, 1995), improved accuracy (Fiori, 2005; Sotillo, 2000) and increased complexity (Chun, 1994; Salaberry, 2000; Sotillo, 2000;

Warschauer, 1996) in learner language, and better retention of vocabulary (Smith, 2004). CMC also reportedly brings to learners affective benefits, such as reducing language anxiety (Beauvois, 1998; Warschauer, 1996), increasing confidence (Beauvois, 1998; Warschauer, 1996), and encouraging learner-centered learning process (Beauvois, 1998; Chun, 1994; Kern, 1995). In the following, I summarily discuss the major studies that investigated the effect of CMC on learner's language output and attitudes.

2.3.1 Linguistic Benefits of CMC

Language output in a CMC environment, in comparison with that in a F2F environment, is marked with increased quantity and improved quality. With regards to quantity, Kern (1995) reports that learners produced more language output in a CMC environment than in a F2F environment. Improvement in the quality of language was measured in various ways including syntactic complexity (Salaberry, 2000; Sotillo, 2000), lexical richness (Sotillo, 2000), and accuracy (Fiori, 2005; Pellettieri, 2000; Sotillo, 2000).

In Kern's (1995) study, 40 students from two sections of second-semester French course participated in CMC and F2F discussions for 14 weeks. The CMC discussion sessions, each of which lasted approximately 50 minutes, were held once every two weeks. Learners started a discussion using CMC, based on a set of questions given at the beginning of each session. A F2F discussion session on the same topic followed the CMC discussion session a few days later. Kern compared student discussion data produced in CMC and F2F settings and found marked differences between them in terms of amount of speech, grammatical characteristics of learner language, and turn-taking behaviors. First, learners produced more language in CMC

than in F2F mode. Second, the learners also produced more morphosyntactic features, such as different verb forms. The CMC interactions were also marked by increased turn-taking, reduced code-switching, use of a wider variety of discourse functions, and increased student-to-student interactions, as well as reduced role of the instructor.

Salaberry (2000) is one of the earliest studies that report the benefit of CMC in improving grammatical knowledge. Comparing the production of one particular morphosyntactic feature, past-tense verbal ending in Spanish, in CMC and F2F settings, Salaberry found that the production of the target form was more evident in CMC than in F2F setting. The participants of his study were 4 third-semester Spanish learners. They participated in open-ended discussions on given topics in both CMC and F2F settings. The discussion topics for the CMC and the F2F sessions were designed to solicit the use of the target form. The recorded F2F discussions were later transcribed and compared with the CMC discussion logs. In the end, Salaberry found that learners exhibited the first signs of target form production more clearly in the CMC environment than in the F2F one. Based on the finding, Salaberry argues that CMC helps learners develop morphosyntactic knowledge in the target language. He attributes this benefit to the visual saliency of CMC interactions and increased opportunities for scaffolding that CMC makes possible.

Sotillo (2000) investigated the role of CMC in improving the complexity of learner language. Sotillo conducted a close examination of the language produced in CMC in order to investigate whether learners would use more complex language marked by the increased use of subordination. Her study compared the language produced in synchronous CMC, namely a real-time chat program called Internet Relay

Chat, and that in asynchronous CMC, namely a web-based discussion forum. The participants of Sotillo's study, 25 ESL learners, were engaged in weekly synchronous or asynchronous discussions. The discourse data were collected from two synchronous and two asynchronous sessions in order to examine quantitative and qualitative differences between the languages produced in two different modes of CMC. The results indicate that asynchronous discussions exceed synchronous discussions in term of syntactic complexity, which is measured by the degree of subordination use. It was also found that synchronous discussions included more varied discourse functions and fewer grammatical errors than asynchronous discussions.

Pellettieri's study (2000) reports increased accuracy in learner language output in CMC. In her study, 20 intermediate-level Spanish learners were divided into pairs and participated in the total of five CMC sessions over the course of one quarter term. Each pair collaboratively completed a language task in each CMC session. Pellettieri examined the nature of language modifications that the learners made during their CMC interactions. She also examined whether the CMC interactions led to corrective feedback and subsequent production of target-like language by learners. In the end, Pellettieri found that the learners made frequent modifications of the grammatical structure of their language. Corrective feedbacks by the partners as well as self-corrections were also observed. These grammar-focused modifications in turn resulted in production of target-like language. Pellettieri contends that the CMC interactions that trigger linguistic modifications eventually contribute to the increased accuracy in their language production.

Fiori (2005) suggests that CMC, when combined with a certain learning strategy, can further improve accuracy in learner language. The participants of her study, which looked into the role of a particular teaching strategy on grammatical accuracy in CMC, were 44 Spanish learners. The learners were assigned either to an experimental group or a control group. The experimental group was instructed to pay attention to linguistic forms while attending online discussions. There were no particular instructions concerning linguistic forms given to the control group. Using an online chat program, both experimental and control groups participated in synchronous discussions each of which lasted 40 to 50 minutes. The discussion sessions were held once a week for 11 weeks. In the end, the experimental group outperformed the control group in production of the target linguistic forms with increased accuracy. Moreover, the experimental group also exhibited overall improvement in their grammatical knowledge that was evidenced in the increased production of syntactically complex sentences.

The findings of literature indicate that certain features of CMC facilitate improvement in linguistic performance by learners. In a CMC environment, learners were observed to employ a wide variety of discourse functions and to produce larger amount of language output marked with increased accuracy and complexity. CMC discourse also revealed many incidents of negotiation of meaning. A CMC environment displays learner interactions visually, thus enabling learners to monitor their own as well as their peers' language use. Such visual saliency and learner-centered learning environment promoted by CMC is believed to enhance language development.

2.3.2 Affective Benefits of CMC

In addition to the linguistic benefits of CMC as discussed above, CMC is also reported to have affective benefits to language learners. These benefits range from reduced anxiety (Beauvois, 1998; Warschauer, 1996), to increased enjoyment (Lee, 2004), increased confidence (Warschauer, 1996), and to increased motivation (Kelm, 1992). Since the learner's psychological state likely affects the language learning both positively and negatively, the potential capacity of CMC in mediating negative affective factors and enhancing positive ones needs to be actively explored.

Language anxiety, as defined by Oxford (1999), refers to "fear or apprehension occurring when a learner is expected to perform in the second or foreign language" (p. 59). Oxford notes that language anxiety could cause learners to experience a sense of terror and nightmares, impede learner's performance in the target language, and result in failure in or withdrawal from the target language course in an extreme case. According to Gardner and MacIntyre (1993), anxiety is also the strongest negative factor that affects learner's language achievement. Since its negative effects could be debilitating for language learners, it is important to find ways to harness it. CMC is reported to be effective in lessening the language anxiety (Beauvois, 1998; Chun, 1994; Warschauer, 1996).

The reduction of anxiety may be attributed to the unique environment that CMC creates. According to the list of the correlates of language anxiety compiled by Oxford (1999), there are various factors that contribute to the development of language anxiety. They include personal (e.g. self-esteem), social (e.g. identity and culture shock), and procedural factors (e.g. classroom activities and instructor-learner interactions). Among

those factors, social anxiety and instructor-learner interactions seem to be particularly relevant to the discussion of CMC. Social anxiety includes such negative affects as speech anxiety, shyness, and stage fright. It is possible that the absence of physical presence of peers and instructors in CMC environment helps mitigate the social anxiety. Likewise, the learner-directed interaction facilitated in CMC environment reduces the language anxiety triggered by negative nature of instructor-learner interactions, such as harsh or uncomfortable error correction by the instructor in front of a class.

Language anxiety is not a rare incident that only some faint-hearted learners experience. During their investigation in the relation between learners' personality types and their attitudes towards the use of CMC, Beauvois and Eledge (1996) noted that most learners, even outgoing ones, experienced language anxiety when they had to speak up in front of the class in the target language. The participants of their study, 19 third-year French learners, were categorized into several personality types based on the results of a personality assessment test, the Myers-Briggs Type Indicator, at the beginning of the study. The learners were then instructed to express their impressions of CMC sessions, held weekly over eight weeks, in forms of journal entries, questionnaires, and an interview. In the end, most of learners reported affective benefits of CMC on their learning. CMC afforded the introvert learners time to think quietly at their own pace without pressure from F2F presence of peers. Even the extrovert learners welcomed the absence of the stress associated with speaking in front of others in a CMC environment. Beauvois and Eledge argue that CMC presents a potential benefit in mitigating performance-related anxiety.

The previous studies also suggest that reduction in anxiety is likely reflected in the change of such learner's behaviors as participations in discussion using the target language. For example, Warschauer (1996) reported an increase in participation by the learners who reported reduction in their stress level in CMC. Similarly, Beauvois (1998) documented on one reticent learner who flourished in CMC discussions "as if, after self-imposed silence, she had suddenly found a 'voice' and was able to communicate" (p. 208). These findings suggest that a learner's psychological state could affect his/her performance and participation. Consequently, the potential of CMC in heightening positive affect deserves further investigation.

2.4 Transferability of CMC benefits

Despite the reports that CMC is facilitative in promoting the production of quality language and in reducing language anxiety that is considered to be detrimental to SLA, these reputed benefits in the language learning are discussed almost exclusively within the context of CMC. Whether these CMC benefits can be transferred to the language use in a non-CMC environment is still a matter of debate. Several studies, however, attempted an investigation into the effects of CMC on learner's subsequent language use in a non-CMC environment.

The study by Sullivan and Pratt (1996) is one of the earlier studies that examined the effect of CMC on learner's language production, specifically on learner's writing, in a non-CMC environment. They compared the written work produced by the learners from two different classes: the Oral class which conducted peer evaluations of their compositions in a traditional F2F setting, and the CMC class which used a computer program called *InterChange* for the same peer evaluation process. Prior to the

experiment, learners submitted a sample work of their writing. This pre-experiment writing was later compared with the post-experiment writing to see if there was any improvement in their writing skill. The study found that the mean writing score of the CMC class significantly increased over the course of 15-week experiments in comparison with that of the Oral class. Sullivan and Pratt, however, did not clarify what comprised of the writing score or what type of improvements was achieved by the learners as a result of their CMC experiences.

Payne and Whitney (2002) furthered the investigation by examining the effect of CMC on the development of learner's oral proficiency. The participants of their study, 58 learners in a third-semester Spanish class, were divided into two groups: the CMC group whose members spent half of their instructional hours in a computer lab using CMC, and the control group whose members spent all their instructional hours in a conventional classroom setting. Payne and Whitney compared the results of oral proficiency tests that the learners took before and after the study sessions. The oral proficiency test evaluated learner speech – five-minute long spontaneous presentation on a given topic – on a basis of comprehensibility, fluency, vocabulary usage, syntax and grammar, and pronunciation. The comparison of the pre- and the post-study test scores revealed significantly greater development of oral proficiency among the learners in CMC group than those in the control group. Payne and Whitney attribute the gain in oral proficiency to the unique CMC environment where learners are urged to participate to prove their online presences. Absence of competition to take the floor makes it easier for learners to voice their opinions. In addition, the capacities of CMC in increasing learner's self-monitoring of their language use, while reducing the speed of

conversations, may be facilitative in lessening memory load and giving learners extra time for planning.

Abrams (2003) conducted a similar study, but obtained different results. The participants of her study were 96 learners in a third-semester German class in an American university. These participants were randomly assigned to one of the three different learning modes: F2F, synchronous CMC using a WebCT chat tool, and asynchronous CMC using a WebCT bulletin board. Learners first participated in oral F2F discussion, then in discussion sessions conducted in the learning mode they were assigned to, and finally in another F2F discussion. The first and the last oral performances were compared. Oral performance was assessed in terms of quantity and quality. As for the quantity of learner oral output, the F2F group and the synchronous CMC group produced significantly more language units than the asynchronous CMC group. Abrams contends that the synchronous CMC experience contributes to learner's increased fluency. As for the quality of language, although the F2F group showed a slight edge over the CMC groups in incorporation of new words, the differences among the three groups were not statistically significant. Similarly, there was no statistically significant difference in the syntactic complexity of the language output among the three groups. In short, contrary to the findings of Payne and Whitney (2002), learner's CMC experience in Abrams's study did not lead to significant improvement in the quality of learner's oral performance.

It should be noted that Abrams employed three measures to evaluate the quality and quantity of learner oral output. In order to measure the quantity, she counted the number of C-units. C-unit is defined as "grammatical independent predicate(s)" (as

cited in Foster, Tonkyn, and Wigglesworth, 2000) and is used for analysis of language output. As for the quality, Abrams looked into the lexical richness and the syntactic complexity. The lexical richness was defined by the ratio of new word to the total number of words used in utterance. The syntactic complexity was measured by the coordination index (cf. Warschauer, 1996), which is the ratio of coordinated clause to the total number of independent clauses. These quantitative measures made it possible for Abrams to identify which areas of language development CMC possibly contributed to improve.

The studies discussed here suggest that the benefits of CMC, such as increased complexity in learner language output, may be transposed to the subsequent language use in a non-CMC environment. Learners' output, both written and oral, was shown to improve after their participation in CMC activities. However, the number of studies on the transferability of CMC benefits is still small, thus making it difficult to call their findings conclusive. Moreover, there are some conflicting claims among these studies as to the superiority of the CMC mode to the F2F mode in improving the quality of learner language. In an effort to verify the findings of previous studies, the present study conducts a quantitative evaluation of language output and affective state of learners. In the next chapter, I will present the research questions and describe the methodology of the present study in detail.

Chapter 3: Method

This study compares the oral production and the attitude towards oral communication between two groups of Japanese language learners: those who undertook a series of language tasks in a F2F setting, and those in a CMC setting. The study design broadly follows the one employed in Abrams (2003), who also examined the effect of CMC on learner language output in oral communication.

3.1 Research Questions

The aim of this study was to determine whether the CMC experience affects language production in subsequent oral communication. Prior studies have shown that, in a CMC environment, learners produce language that is syntactically and morphologically advanced (Chun, 1994; Kern, 1995; Salaberry, 2000; Warschauer, 1996), incorporate a rich lexicon (Warschauer, 1996), and utilize a wide variety of discourse functions (Chun, 1994; Sotillo, 2000). In this study, I examine whether these reported benefits of CMC transfer to F2F oral communication. Specifically, I examine how the amount of the learner language output, syntactic complexity, lexical richness, and accuracy change after participation in CMC discussions.

This study also examines the effect of CMC on learner attitude towards oral communication. Previous studies have suggested that CMC reduces learner anxiety and stress (Beauvois, 1998; Warschauer, 1996) and enhances learner motivation (Kelm, 1992; Lee, 1998). In this study, I aim to verify these reported benefits of CMC in learners' affective state. I examine whether CMC helps increase a learner's willingness to communicate (WTC) while reducing anxiety.

I address the following research questions:

1. Do learners produce a larger volume of language output marked by increased syntactic complexity, lexical richness, and accuracy after their experiences with CMC?
2. Do learners exhibit an increased willingness to communicate and reduced anxiety in using Japanese in F2F oral communication after their experiences with CMC?

Based on the findings and claims in previous research, I formulate the following hypotheses:

H1. Learners produce more language output marked by increased syntactic complexity, lexical richness, and accuracy after their experiences with CMC.

H2. Learners are more willing and less anxious in using the target language in F2F oral communication after their experiences with CMC.

3.2 Participants

The participants of this study were 15 learners (8 males and 7 females) enrolled in a third-year Japanese course (JAPAN 302: Intermediate Japanese II) at the University of Alberta. The participants had taken five semester courses or the equivalent. There are approximately 130 instructional hours in each semester. In addition to regular in-class activities and exercises in a workbook for self-study, learners are also required to complete a set of CALL activities, using a program called WebCT.

In the Student Information Questionnaire (see Appendix A) that solicited the participants' demographical information and familiarity with communication technology prior to the study, all participants reported general familiarity with CMC. The participants were also familiar and comfortable with the Japanese input method which requires special knowledge of typing Japanese characters. Participation in this study

was entirely voluntary. In the end, only the data from 12 participants (6 males and 6 females) were used for the analysis because 3 participants did not complete all requirements.

3.3 Study Design and Procedure

There were two distinct aspects of this study, a quantitative examination of CMC effect on oral language output and attitude towards oral communication, and a qualitative assessment of the CMC experience, particularly that vis-à-vis a F2F discourse. As schematically shown in Figure 1, the study was designed to include a set of five sessions. It started and ended with F2F discussions, but included distinct two paths: one comprising a set of three CMC sessions, and a second path, for the control group, comprising an equivalent set of three F2F discussions.

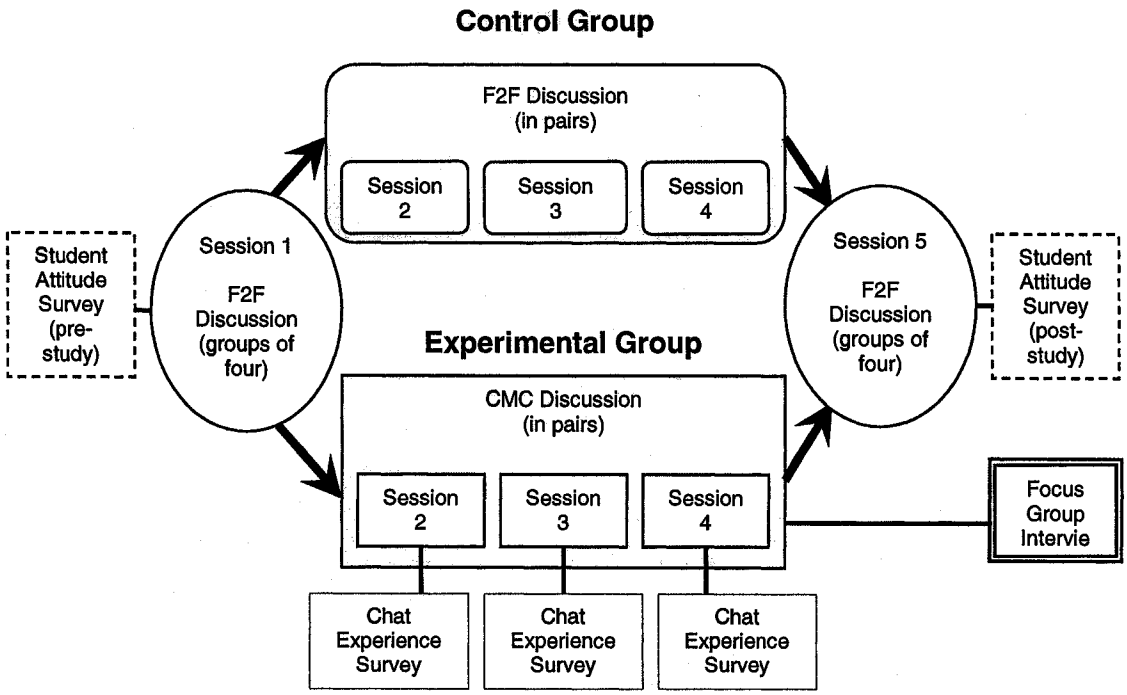

Figure 1. A schematic illustration of the study design

It should be noted that S1 and S5 were the focal points in collecting the quantitative data. If CMC benefits are transferable, the changes in oral output and attitude are expected to be significantly greater for the CMC group. Another survey was filled in by the learners in CMC group after each CMC study sessions to report their experiences with CMC. A focus group interviews were also conducted with the CMC participants at the end of the study.

Prior to the study, general proficiency of the participants in Japanese was measured. Following Meara and Buxton (1987), I have prepared a type of vocabulary test named a Yes/No test that consisted of 50 words and 50 non-words in Japanese (see Appendix B). Learners were instructed to mark the words they knew. The number of marked real words less the number of marked non-words was calculated as a participant's proficiency score.

In an effort to keep the constitutions of two groups as similar as possible, the scores in this proficiency test as well as the gender were taken into consideration in assigning learners either to a control F2F group or an experimental CMC group. When determining the pairs for the three study sessions, each participant's personality, perceived oral proficiency, and schedule were considered. Since the learners were to closely work together in the three study sessions over the course of two weeks, it was important to assign pairs with good pair dynamics and complementary proficiency in Japanese. The participants' schedule preferences also had to be respected and incorporated into the test design because their participation was voluntary and the learners were using their free time for the study.

The language tasks that the learners were instructed to undertake in Japanese in the five discussion sessions were designed to require the learners to work collaboratively with their partners, thus encouraging maximum Japanese output from them (see Appendix C for overview of the language tasks for the five sessions). Although each task was distinct, the tasks as a whole were loosely bound under a broad theme of dating and marriage, a theme that was expected to appeal to the age group of the learners. Moreover, since this theme did not overlap with the content of the ongoing course, it also helped minimize confounding effects of progressive learning. Although there was no time limit set for the completion of the tasks, it was expected that each task takes 15 to 20 minutes to complete.

Five discussion sessions were held over a period of two weeks. The duration of the previous CMC studies ranged from a single class (Warschauer, 1996) to a quarter term (Pellettieri, 2000) to two semesters (Chun, 1994). The two-week period of the present study, therefore, was thought to be within a reasonable range. The decision of the study duration was also made based on the findings from a pilot study. The pilot study held three sessions over the course of one week. After the pilot study, however, it was felt that three sessions, which translated into only one study session in the middle, were not powerful enough to bring about a measurable effect on language production and affect. Additionally, from a practical point of view, the two-week study period was also considered reasonable to maintain continuous participations by the volunteer participants.

3.3.1 Data Collection for Language Output

For a quantitative analysis of language output by learners, F2F discussion in S1 and S5 were video-recorded and later transcribed. In those sessions, learners from the CMC and the F2F groups were randomly put into groups of four and instructed to complete assigned tasks in a F2F setting. The size of the task group in these sessions was made larger, at four, than in the middle three sessions, in which the learners worked in pairs. The group size was intended to provide learners with the freedom to decide when and how much to participate in a group discussion. Working in pairs suited the purpose of the three study sessions in the middle to maximize opportunities for learners to practice Japanese. However, it was possible that pair work pressured learners to participate in discussions against their desire, which could interfere with the accurate measurement of attitudinal change reflected in learner participation. In the middle three study sessions, learners in the control group engaged in discussions over a given topic in a F2F setting.

3.3.2 Data Collection for Learner Attitudes

In order to measure the attitudinal change towards oral communication in Japanese, Student Attitude Survey and Chat Experience Survey were administered. In order to measure participants' Willingness to Communicate (WTC), the Student Attitude Survey (Appendix C) was filled in by all the learners at the beginning and the end of the study. WTC, examined in depth by MacIntyre, Dornyei, Clement, and Noels (1998), refers to a self-declared indication of how likely a learner would initiate a conversation with other people in the target language in various situations (see Section 3.4.2 for more detailed discussion on WTC). The Chat Experience Survey (Appendix

D), given to learners in the CMC group after each CMC session, aimed to investigate the perceived value of CMC experience in harnessing certain affective factors. The survey solicited learners' general feeling towards chat experience and asked them to indicate how strongly they agree or disagree with each given statement on a scale of 1 (Strongly disagree) to 7 (Strongly agree).

3.3.3 Data Collection for Qualitative Analyses

Additional qualitative data were collected in two areas: learner perception of the value of CMC in language learning, and differences in discourse patterns in the discussions held in CMC versus F2F. The former was collected through a focus-group interview which was conducted with the learners in CMC group. For the latter, four sets of discussion data, two from the CMC group and the other two from F2F group, were collected from S3. Unlike the quantitative analyses that compared the oral discussion data in S1 and S5, the qualitative analysis compared CMC discussion data and F2F discussion data in S3 to see whether there are any differences in patterns between the two environments.

3.4 Analyses

3.4.1 Analysis Measures for Language Output

In order to determine whether there are differences in the learner language before and after the CMC sessions, I examined the following aspects of learner language: (i) amount of speech, (ii) syntactic complexity, (iii) lexical richness, and (iv) accuracy. These measures were employed in the previous studies that reported improved language production exhibited by learners in a CMC environment (Abrams, 2003; Sotillo, 2000; Warschauer, 1996). This study used the same measures to determine whether the

similar results could be observed in F2F communication that follows a series of CMC sessions.

The present study employed Analysis of Speech unit (AS-unit) for the analysis of learner language output (Foster et al., 2000). AS-unit is defined as "a single speaker's utterance consisting of an independent clause, or sub-clausal unit, together with any subordinate clause(s)" (p. 365). Independent clause refers to a clause which contains a finite verb. Sub-clausal unit refers to "either one or more phrases which can be elaborated to a full clause by means of recovery of ellipted elements from the context of the discourse or situation" (p.366) or a minor, but meaningful utterance, such as "Thank you" and "Yes".

AS-unit is proposed as a new unit to rectify the deficiencies of other commonly used language analysis units, such as utterance, minimal terminable unit (T-unit), and communication unit (C-unit). First, identification of AS-unit, unlike that of utterance, is independent of the intonation and pauses. Since learners often do not possess good control over intonation and pauses, utterance may be considered a less reliable measure (Abrams, 2003). Second, AS-unit incorporates ellipses that are excluded in the definition of T-unit and only partially included in that of C-unit. Ellipses are frequently found in oral interactions, thus their omissions would make T-unit and C-unit inadequate for the analysis of oral data (Foster et al., 2000). AS-unit, on the other hand, can account for all elliptical constructions as sub-clausal unit. The applicability of AS-unit to Japanese discourse data was a concern because it was developed based on the discourse data of ESL learners. However, Tajima (2003) demonstrated that AS-unit could be applied to the analysis of Japanese discourse data.

(i) Amount of speech measure. Amount of speech was measured simply by the total number of AS-units that a learner produced. The learner participation ratio was also examined as part of the investigation into the amount and manner of language production. Prior studies reported that CMC is effective on equalizing participations among learners, particularly with the increase in participation by normally reticent learners (Beauvois, 1998; Warschauer, 1996). The present study aimed to examine whether similar effect of CMC is observed in the ensuing oral communication. Learner participation was measured by the number of AS-units produced by each student in one discussion session. Learner's proportionate participation was then calculated by dividing the number of AS-units that she/he produced by the total number of AS-units produced by all the participants during the course of discussion.

(ii) Complexity measure. Syntactic complexity was measured by the number of subordinate clauses per AS-unit. The number of clause per AS-unit measures the degree to which a learner incorporates subordinate clauses into his/her speech. It was expected that advanced language learners would use more subordinations than beginners (Warschauer, 1996). Sotillo (2000), in her investigation into the quality of learner language in synchronous and asynchronous CMC, looked at the number of subordinate clauses per T-unit. Because of the superiority of AS-unit to T-unit in analyzing oral data as explained earlier, the present study used AS-unit in place for T-unit when tabulating the ratio of learner's use of subordination in his/her speech.

(iii) Lexical richness measure. Lexical richness was measured by type-token ratio (TTR), following the methodology of previous studies (Abrams, 2003; Warschauer, 1996). TTR represents the ratio at which a speaker incorporates different words into

his/her speech. It was calculated by dividing the number of different words by the total number of words used by a speaker. Higher TTR is considered to reflect greater lexical richness (Warschauer, 1996).

(iv) Accuracy measure. Following Sotillo (2000), accuracy was measured by the ratio of error-free AS-unit to the whole speech. Morphosyntactic errors were counted as error. It was calculated by dividing the number of error-free AS-unit by the total number of AS-unit.

The scores in S1 and S5 for each measure were compared to see if there were any changes. One-way ANOVA with a mixed design was performed on these scores to see if there were significant differences between the F2F learners and the CMC learners. Mixed design was used because the data involved both a between-subjects measurement (CMC versus F2F) and a within-subjects measurement (S1 versus S5). The results of ANOVA tests were to be interpreted with caution due to the small sample size in the study.

3.4.2 Analysis Measures for Learner Attitudes

In examining the possible effect of CMC on learner's affective state, I aim to see if the CMC experience could promote positive outlook towards oral communication and mitigate negative emotions that discourage them from speaking in the target language. To this goal, two affective elements are highlighted as the focus of investigation: (i) WTC and (ii) anxiety.

(i) WTC measure. In an effort to quantify learner attitude towards oral communication, WTC measure was employed. WTC represents "the probability that a learner will actually use the language in authentic interaction with another individual"

(MacIntyre, Dornyei, Clement, and Noels, 1998, p. 558). Various factors in linguistic, communicative, and psychological areas, such as self-confidence and interpersonal motivation in the target language, influence a person's WTC. WTC increases when the variables in these fields culminate to produce an optimally positive communicative environment. Because WTC entails learner's self-declared readiness to engage himself/herself in conversations in the target language, it was thought to be an appropriate measure for the present study to evaluate learners' attitudinal change towards oral communications. The learners indicated their WTC before and after the study in the Student Attitude Survey. One-way ANOVA with a mixed design was then performed on the pre- and post-study WTC scores to see if there were significant differences in learner's WTC between the F2F learners and the CMC learners.

(ii) Anxiety. Another important facet of examination of the affective benefit of CMC was to see if CMC could help reduce learner's language anxiety whose debilitating effects on language learning have been pointed out in the previous research (Gardner and MacIntyre, 1993; Oxford, 1999). To collect data on perceived effectiveness of CMC in reducing anxiety, the Chat Experience Survey was administered after each CMC session to the learners in the experimental CMC group. A paired-samples t-test was performed on the scores in the Chat Experience Survey from the first ant the third CMC sessions, or S2 and S4, to see if there were any measurable changes in learner perception.

The results of the analyses are discussed in the next chapter.

Chapter 4: Results

In this chapter, I present the results of the quantitative and the qualitative analyses. The language data were taken from oral discussions held before and after study sessions. Learners' affective state, namely WTC and anxiety, were measured by their responses in the two surveys conducted before and after the study sessions. For the quantitative portion of the analyses, a one-way ANOVA test was performed on language data and survey results to determine if there were significant differences in the language output and attitude towards oral communication between the CMC and the F2F groups. For the qualitative portion of the analyses, a learner's perception of the value of CMC was solicited in a focus-group interview, and CMC and F2F discussion data were examined to highlight potential differences in discourse patterns between the CMC and F2F modes. The following sections present the results of these quantitative and qualitative analyses.

4.1 Language Output

It was hypothesized, based on the findings in the previous studies (Abrams, 2003; Chun, 1994; Sotillo, 2000; Warschauer, 1996), that a CMC experience would lead to both a qualitative and quantitative increase in language output. However, results from ANOVA tests comparing CMC and F2F sessions did not support this hypothesis. There was no significant difference in the volume of language output between the CMC and the F2F groups nor in the quality of language output in all facets of the analyses, including syntactic complexity, lexical richness, and accuracy. Below I discuss in detail these results.

4.1.1 Amount of Speech

Table 1 and Table 2 present the ANOVA results and the mean scores for the amount of speech measure respectively. A t-test on the amount of speech measure in the pre-study session (i.e. S1) showed that the CMC and the F2F groups were not significantly different from each other prior to the study sessions; t (10) = -.074, ns, two-tailed.

Table 1

ANOVA Results for Amount of Speech Measure

Source	SS	df	MS	F	p
Amount of speech	3504.167	1	3504.167	14.590	.003
Learning mode	793.500	1	793.500	.887	.367
Amount * Mode	.000	1	.000	.000	1.000

Table 2

Mean Scores for Amount of Speech Measure

	Number of AS-units	
Group	S1	S5
F2F	31.50	55.67
CMC	43.00	67.17

Overall, learners were much more talkative in the last discussion session than in the first. Despite the fact that the language tasks for both sessions were identical, S5

lasted almost 50% longer than the first. The overall average length of the discussion session increased from 13.9 minutes in S1 to 20.4 minutes in S5. Learners also produced more AS-units in S1 than in S5: by 76.7% for the F2F participants and 56.2% for the CMC participants. Although the increase in speech volume was statistically significant, $F(1, 10) = 14.590$, $p < .01$, there was no interaction between the increase in speech volume and the learning modes. This result was inconsistent with previous studies including Kern (1995) who found that the learners produced more language output in a CMC environment than in F2F environment.

Results from learner participation ratios were inconclusive. Share of participation was calculated by dividing the number of AS-units that a learner produced by the total number of AS-units produced by all the participants during the course of discussion. Although the participation became somewhat more equally distributed between CMC and F2F groups in the last oral discussion compared to the first one, the CMC group's proportionate contribution appeared to decline. In the first oral discussion, CMC group members together produced 57.7% of total interactions compared to 42.3% of total interaction for the F2F group. The share of participation for the CMC group in the last discussion session decreased to 54.7% whereas the F2F group's share increasing to 45.3%. However, the decline in the CMC group's share of interactions was statistically non-insignificant. These results indicate that equalized participation among learners observed in a CMC environment may not readily transfer over to ensuing oral communication settings.

4.1.2 Syntactic Complexity

Results from ANOVA tests showed that the CMC experience did not have a positive impact on the complexity level of learner language, in contrast to the expectation that learners with a CMC experience would produce more syntactically complex language. In fact, the number of subordinate clause per AS-unit for the CMC group speeches decreased slightly from 0.11 to 0.07, while it increased from 0.07 to 0.09 for learners in F2F speeches (see Table 3). These changes were, however, statistically non-insignificant, $F(1, 10) = 1.496$. On the whole, the learners, regardless of whether they were assigned to a CMC or an F2F learning mode, did not exhibit a significant change in their use of complex language after their assigned sessions. Overall, results in this section did not support the hypothesis that a CMC experience is associated with increased use of complex structures in follow-up oral communications.

Table 3

Mean Scores for Syntactic Complexity Measure

	Number of subordinate clauses		Subordinate clause/AS-unit	
Group	S1	S5	S1	S5
F2F	3.00	6.83	0.07	0.09
CMC	4.67	4.17	0.11	0.07

4.1.3 Lexical Richness

Results from ANOVA tests did not show a significant difference in the lexical richness of learner speech for the CMC and F2F groups, $F(1, 10) = 0.371$, which is

consistent with the findings in Abrams (2003). These findings did not support the hypothesis that a CMC environment improves the lexical richness of learner language.

As shown in Table 4, language output did increase in S5 compared to S1. The mean number of words generated by learners increased from 186 words to 306 words for the F2F group, and from 152 words to 254 for the CMC group. The increase in word production, however, was not accompanied by the production of different words. As a result, the TTR declined for both the CMC and the F2F groups. However, the difference in decline for the two groups was not statistically significant.

Table 4

Mean Scores for Lexical Richness Measure

	Number of words		Number of different words		Type-Token Ratio (TTR)	
Group	S1	S5	S1	S5	S1	S5
F2F	186.33	305.67	91.17	127.83	0.54	0.44
CMC	151.50	253.50	75.00	115.00	0.58	0.51

4.1.4 Accuracy

To test the hypothesis that a CMC experience leads to increased accuracy in language production, the ratio of error-free AS-units to the total number of AS-units was compared between pre- and post-study sessions in both the CMC and the F2F groups. The accuracy rate declined from 0.85 to 0.82 for the CMC group (see Table 5). The control group also experienced a similar reduction in the accuracy measure, with its accuracy rate falling from 0.89 to 0.86. Results from the ANOVA test indicated that the

reduction in accuracy was not statistically significant, $F(1, 10) = 0.008$, nor was it influenced by the difference in learning modes

Table 5

Mean Scores for Accuracy Measure

	Number of error-free AS-units		Error-free AS-unit/AS-unit	
Group	S1	S5	S1	S5
F2F	27.17	48.17	0.89	0.86
CMC	36.17	56.50	0.85	0.82

4.2 Attitude towards Oral Communication: WTC and Anxiety

I now turn to the issue of how a CMC experience affects learner attitude towards oral communication in Japanese, namely a learner's WTC and anxiety level in using Japanese. Prior findings from CMC studies indicated that learners would feel an increased willingness to communicate and reduced anxiety in the target language in F2F oral communication after their experience with CMC. However, the results of an ANOVA test performed on the Student Attitude Survey scores did not show any increase in WTC, $F(1, 10) = 0.131$, ns. Similarly, a t-test on the Chat Experience Survey scores did not indicate any reduction in anxiety either, $t(5) = 0.611$, ns.

The WTC of learners, whether they were in the CMC or the F2F group, did not change significantly between the pre- and the post-study surveys, nor was it influenced by the learning mode. The finding was consistent with a claim made in the previous WTC study by MacIntyre, Baker, Clément, and Conrod (2001), who report that "people

do possess considerable cross-sectional consistency in their communicative behavior" (p.154). My findings in this study also indicated this enduring nature of WTC, suggesting that CMC does not have a strong enough effect to influence this unwavering trait of learners in the course of two weeks.

Since the model of WTC is made up of state and trait variables, WTC may be less influenced by a change in any one of these variables, such as a change in learning mode, as is the case in this study. It was thought that the CMC effect might be more prominent if a more straightforward affective attribute, such as anxiety, is directly examined. However, results from a t-test on the Chat Experience Survey revealed that the anxiety level did not change significantly for the CMC group either. These results suggest that the effect of CMC on learner affect, whether a compound affect such as WTC or a single-faceted affect such as anxiety, is not as strong as suggested in previous studies.

4.3 Focus-group Responses

A focus-group interview was conducted at the end of the study with the six learners who participated in CMC sessions. These CMC-group learners were questioned on their perceptions concerning the advantages and disadvantages of CMC. The advantages of CMC were recognized broadly in four areas: multi-faceted learning opportunity, extra time and immediacy afforded by CMC, visual saliency, and motivation. First, the learners noted that CMC could enhance various language skills which include reading, writing, and to a lesser degree, oral skills. Because of the format of CMC employed in this study, a text-based chat, the learners reported that CMC helped in improving their reading and writing skills. It provided them with extra

reading practice, trained them to be a quick reader, and increased their familiarity with kanji characters.

Second, participants reported that CMC afforded them extra time to plan and revise their opinions before actually voicing them in public. Its immediacy was also claimed to be conducive of the development of oral skills. In addition, the extra time and the medium of computer enabled the learners to use the extra functions available on a computer, such as an online dictionary.

Third, the visual saliency of text-based CMC interactions was regarded as making it easier for learners to recognize errors. And finally, the learners generally cited a positive effect of CMC on their affective state. Without physical presence of peers, learners were encouraged to take more risks, trying out new expressions and grammar. Probably for the same reason, learners reported that they felt more relaxed in a CMC setting than in an F2F setting. Moreover, the capacity of CMC for instant responses induced increased fun and motivation among learners.

Learners' dissatisfaction with CMC was associated with its inadequacy in improving grammar knowledge and other issues related to CMC, such as a requirement of reasonably strong typing skills and a long set-up time. Some learners pointed out several instances of grammatical errors being left uncorrected in a CMC environment as long as they did not hinder comprehension. Learners also complained that poor typing skills and insufficient kanji knowledge impeded communication in CMC mode.

4.4 Discourse Pattern in CMC versus F2F

The quantitative analyses of oral language output and attitudes towards oral communication did not reveal any significant changes before and after the CMC

experience. Turning now to a learner's discourse patterns, I examine whether these are different for CMC and F2F modes. Prior studies have reported that CMC offers a unique environment that fosters particular features beneficial to SLA (Chun, 1994; Kitade, 2000; Pellettieri, 2000). To verify this claim in my study, the CMC and F2F transcripts were compared to see if there were distinct differences. The discourse data from four pairs in S4, two each from CMC and F2F groups, were chosen based on the equivalent competence level of the members. All four pairs carried out the same language task, which was to rank in the order of importance the conditions necessary for a happy marriage. The F2F discussions were transcribed and compared with the CMC discussion logs.

The results were mixed. On the one hand, it was found that the CMC discourse did include a rich variety of features, such as greeting, initiating and responding to simple statements, and asking and answering questions. Similarly, incidents of error-correction and negotiation of meaning were also observed in CMC. For example, the CMC exchanges shown below illustrate a typical example of negotiation of meaning. (The Japanese utterances are transliterated and written in Roman alphabets, followed by their English translations.) The types of utterances that constitute an episode of meaning negotiation, as described in Section 1.2, are identified in square brackets in italics:

A: Mā, Nihon ka no kekkon yori, ōbē no hō ga ī to omō n'da. [B] san wa? [Well, I think western-style marriage is better than Japanese-style one. What do you think, [B]?] [*trigger*]

B: "Ō-bē" wa nani?

[What is 'oh-bei'?] [*signal*]

A: "Mā, nishi no kuni to iu koto nan'da."

[Well, it is something like western countries.] [*response*]

B: "A sō."

[I see.] [*a reaction to the response*]

The first utterance by Speaker A is identified as a *trigger* because it sets off a communication problem. The following utterance by Speaker B is a *signal*, in which Speaker B indicates that she does not understand the meaning of a word contained in Speaker A's utterance. Speaker A deals with the communication problem by rephrasing the problematic word in the following *response* utterance. The last utterance is *a reaction to the response*, where Speaker B signals understanding, thus indicating an end to the negotiation.

On the other hand, it was found that error-corrections and meaning negotiations were not unique linguistic behaviors that occurred only in CMC. Similar incidents also happened in F2F discourses as shown below:

C: Etto, issyo ni shin'yō suru

[Um, to trust each other] [*trigger*]

D: Shin'yō tte nan'desu ka

[What is "shin'yō"?] [*signal*]

C: To trust

[To trust] [*response*]

D: Ā komyunikēsyon toka shin'yō

[Oh. Communication, trust, and...] [*a reaction to the response*]

Three incidents of meaning negotiation were found in CMC discussion data and four in F2F discussion data. To sum up, the analyses of CMC and F2F discourses in the sample analyzed revealed that linguistic features beneficial to SLA appeared similarly in both CMC and F2F settings.

There were some differences between CMC and F2F discourses. First, CMC entries were much shorter than F2F ones. For example, the longest single turn in the F2F discourse consisted of 71 words and 9 AS-units, as opposed to 14 words and 3 AS-units which made up the longest entry in CMC. It was also observed that one turn could consist of several entries that were posted back to back in CMC. In other words, a speaker's message was cut in midway at several points and sent out in several packages. In F2F discourse, one person's turn could also be cut in midway. However, these interruptions usually occurred, involuntarily on speaker's part, when the speaker was looking for words and the partner chipped in to help out.

Second, there appeared to be a clear preference in speech style depending on the learning modes. All four learners in CMC group chose a casual-speech style that is more commonly used among peers and family members, to carry out discussions. In contrast, three out of four learners in F2F group almost exclusively used a polite-speech style, which is preferred in a more formal setting with such people as acquaintances and new people, throughout their discussions. The fourth learner in F2F group, who was the most proficient speaker of the four, mostly used a casual-speech style. Most learners learn the polite style first in their study of Japanese language. After learners eventually learn the casual style, the decision as to when and where to use these styles is left to the learners. Based on the setting, the interlocutor, and the speaker's relationship with the

interlocutor, a learner would decide which style to employ. It is suggested that CMC encourages learners to try out this later learnt style of speech.

Third, it was found that language production decreased in CMC mode. The two CMC discussions yielded 514 words in total, whereas the two F2F discussions together yielded 1505 words. Provided that all four groups were assigned the same task, I speculate that the CMC had some influence over the decline in language production. This finding, however, contradicts the findings of the previous studies that reported increased language production in CMC mode (Chun, 1994; Kern, 1995).

Fourth, CMC logs included an interesting instance of replication of peer utterance. The instance appeared when two CMC learners were discussing the issues related to marital happiness. One learner pointed out, in an ungrammatical sentence, that a man would make a woman do various chores such as cleaning. A few discussion strands later, the other learner came back to the statement, replicating it with identical wording, including the errors in the original utterance. It was obvious that the second learner copied and pasted the original statement. This copy-and-paste procedure in CMC is worth noting for two reasons. First, it would not be easily performed in F2F, making it a unique feature of CMC interaction. Although learners may copy models in speaking, it would be difficult for them to replicate word-by-word what their interlocutors say, particularly when the utterance is long and complex. Second, the replication instance indicated that the learner turned a blind eye to the errors in the original sentence, let alone repeating them. Although the present study found only one incident, it goes against the common notion that CMC, with its visual saliency, promotes error corrections.

4.5 Summary

To sum up, the results in this study were different from those reported in the previous studies. Learners' language production and affective state in F2F oral discussion did not show any significant change before and after their experience with CMC. Moreover, even when the interactions that took place in a CMC setting were compared with those in an F2F setting, the outcome of the present study contradicted the findings in prior research. The language produced in CMC was neither more voluminous nor more complex than that in F2F. In fact, the CMC language output was briefer than the F2F language output. In CMC, instead of exhibiting increased accuracy, syntactic errors were largely left unattended. In the next chapter, these discrepancies are explained by conducting a detailed examination of the differences in the study conditions between my study and prior studies.

Chapter 5: Discussion

Prior research on CMC effectiveness has found overall support for a beneficial role of CMC on language performance and affective state. In this study, I extend this literature by directly examining the impact of CMC on oral language output in Japanese language acquisition. In contrast to prior findings, I did not find a positive role of CMC in oral language output. In fact, the data indicated that learning with CMC over a two week period did not lead to a significant improvement in oral language output and affective state. I interpret the evidence as cautionary. It is still too early to advocate a wider use of CMC in less studied areas, such as in Japanese language learning. Further investigation into the effects of different variables on language learning is needed before we can assess the effectiveness of CMC on oral language output. An obvious avenue for future work is to determine what factors are responsible for the discrepancy between results in this study and those from previous studies.

Clearly, CMC research has important implications for language teaching. CMC studies in general can help instructors evaluate the use of CMC in language instructions. These studies also help determine the areas and the manner in which CMC can be employed to its fullest benefit in language instruction. The present study provides important insights into CMC use in classrooms, particularly in relation to the development of oral skills and positive attitudes towards oral communication.

I begin by first summarizing the results of this study, followed by a discussion of possible factors that are responsible for generating results that did not support the claims in previous CMC studies. Lastly, I discuss the teaching implications of the findings in the present study.

5.1 Comparison of Results between the Present and Prior Studies

An important contribution of the present study is to substantiate a proposition presented in previous studies that CMC experience can lead to improvements in language production and attitudes towards oral communication. The current study addresses these issues in the context of Japanese language acquisition aided by CMC, and in a non-CMC F2F environment.

Oral language data produced by the CMC group were not significantly different from those produced by the F2F group in terms of the amount of language production, syntactic complexity, accuracy, or lexical richness. In other words, the two-week long CMC use did not lead to a measurable improvement in the quantity and quality of oral language output, in contrast to earlier claims that synchronous CMC experience contributes to the increase in learner's language output in an ensuing oral communication (Abrams, 2003), encourages learners to incorporate syntactically complex structures (Chun, 1994; Warschauer, 1996) and a wide variety of words (Warschauer, 1996) with increased accuracy (Sotillo, 2000).

The result did not indicate any beneficial impact of the two-week long CMC use on learners' attitude towards oral communication in Japanese either. The learners who undertook the CMC study sessions became no more willing to initiate communication in Japanese than those who undertook the F2F sessions. In fact, the willingness to communicate did not exhibit any significant change whether learners underwent CMC study sessions or F2F sessions. These results contradict those reported in previous studies that claimed the effectiveness of CMC on bringing about a positive change in

learner's attitude towards oral communication in the target language (Beauvois, 1998; Warschauer, 1996).

It should be noted that this study had some limitations. First, the sample size was small at 12. Although I was able to collect a group of volunteer students with well-balanced gender composition and complementary competence in Japanese, larger sample size would have helped obtaining more valid data. Second, the study duration could have been longer than two weeks of the present study. As the notion of language transfer suggests, a longer study period might have brought about measurable changes in learners' language output or attitudes towards oral communication in Japanese.

5.2 Factors Contributing to Different Results between the Present and Prior Studies

The difference between the present study and prior work in the field of CMC research can roughly be divided into four areas: study design, the target language, the study duration, and learner familiarity with CMC. In the following, each area is closely examined and its possible bearing on the results of the present study discussed.

5.2.1 Difference in Study Design

There is a clear difference in study design between the previous studies and the present study that might have given rise to conflicting results. On the one hand, the majority of previous studies, despite their claims about the benefit of CMC experience to improvement of *oral* skills, compared learner interactions in F2F setting with those in CMC setting. In contrast, I focused on oral language production based on the learners' immediate experience in either a CMC or an F2F environment. Such a design allowed me to directly investigate the effect of CMC experience on the final oral language

production. Some of the studies that enquired learner's affective state, such as stress and confidence, in communicating with the target language, also compared the data between the two settings. As mentioned earlier, the present study compared oral F2F interactions produced by learners and their affective state before and after they underwent three study sessions either in CMC setting or in F2F setting, thus making it possible to directly measure the linguistic and affective change of learners.

A problem arises when many of the previous studies claim, based on indirect evidence, that linguistic and affective improvements observed in CMC mode would transfer to oral communication in F2F environment. When the previous studies found that the learners used more grammatically complex structures and new words with increased accuracy in CMC discussions as compared to F2F discussions, these findings were extrapolated to claim that CMC contributes to an overall improvement in second language learning. In other words, previous work on CMC has tended to over-generalize the findings, perhaps on the assumption that, since CMC shares many characteristics of oral language, the improvements in language performance in CMC is easily replicated in an oral communication setting. Unfortunately, the study design was not adequate to yield inferences that are outside the immediate focus of these studies. The claim that learners can produce similarly high quality language and reach the similar comfort level in F2F environment after their experiences with CMC is not borne out in an oral communication context in this study. My finding that learner's CMC versus F2F experience did not influence their oral language output is consistent with the findings from previous studies that tested effects of CMC on learner's oral performance,

including Abrams (2003). However, such studies are scarce, therefore assessment of CMC effect on oral communication requires additional work.

5.2.2 Difference in Target Language

Another difference between the present study and the previous studies deals with the target language. The target language examined in this study is Japanese – a language less commonly studied than other alphabetic European languages. This difference in target languages may have affected the outcome of the present study in comparison with those of the previous studies. Research in the area of SLA (e.g., Odlin, 1989) indicates that difference between the target language and the native languages of learners influences the acquisition of the target language. Odlin terms this notion of cross-linguistic influence as language transfer, and defines it as "the influence resulting from similarities and differences between the target language and any other language that has been previously ... acquired" (p. 27). The language transfer could accelerate or slow down the target language acquisition depending on the degree to which the native language differs from the target language. For example, similarities in vocabulary reduce the time required to attain strong reading comprehension skill. Similarities in syntactic structures are reported to facilitate learner's development of grammar knowledge. At the same time, language transfer could have negative effects on learner's language production. Odlin observes, for example, that learners use native language forms in a target language sentence, make word-order errors that mirror the patterns in the native language, or avoid altogether the use of particular structures in the target language that are not common in their native languages.

Most importantly, a native language appears to have a great influence over the length of time it takes for a learner to acquire a target language. The Foreign Service Institute in the United States provides a list that presents a number of weeks it takes an English-speaking learner to reach high level of proficiency in different languages (as cited in Odlin, 1989). According to the list, Arabic, Bengali, Chinese, and Japanese take 44 weeks for an English-speaking learner to acquire, as opposed to 20 weeks for German, French, Italian, and Spanish. Suppose the length of each class is the same for all learners and learners do not exhibit any significant differences in their language-learning aptitudes, as Odlin contends, "the languages themselves are of varying difficulty" (p. 40) for English-speaking learners.

Considering the difficulty Japanese poses to English-speaking learners, one could assume that the results obtained in the CMC studies on Germanic or Romance languages may not be directly comparable to those obtained for Japanese. It would presumably take longer for English speakers to master Japanese than French. As a result, it is quite possible that a CMC study conducted on Japanese learners could not find any observable improvements in its subjects' language behaviors while a similar study done on French learners may see considerable improvements. It is possible that this study, which dealt with Japanese as the target language, needed a longer study period than three sessions, although the same study period may be long enough to yield a significant result in a study dealing with French or Spanish as a target language. In sum, consideration over the difference between the target languages in relation to learners' mother tongues is essential if the study design and the findings of one study are to be applied to another study.

In addition, the type of target language may affect the time and attention demanded on learners to produce messages in CMC. For example, typing a CMC message in Japanese would take a considerably longer time and demand more attention than typing an equivalent message in an alphabetic language, such as Spanish, because producing a message in Japanese in CMC has to go through two steps. A learner first types in a Japanese word using alphabet-based computer keyboard after transliterating the word into Roman alphabets. As the learner types in the word, the typed word appears in Hiragana, the Japanese alphabet, on screen. The learner, then, converts the Hiragana word into appropriate Kanji, Chinese characters, or Katakana, the second set of the Japanese alphabet. A CMC study conducted on learners of Chinese, another non-alphabetic language, suggested that typing speed could affect learner participation in CMC (Xie, 2002). In Xie's study, learners of Chinese who participated in three sessions of text-based chat discussion commented in the post-study survey that those who were adept at typing in Chinese had an advantage over slow typists in controlling CMC discussions. Xie's finding contradicts the earlier finding that claimed CMC contributes to more equitable participation among learners (e. g., Warschauer, 1996). Since earlier studies were based on alphabetic languages, Xie's finding may indeed suggest that target language has a bigger role than initially thought in influencing the way interactions take place in CMC environment.

High demand on time and attention expended in producing orthographically accurate messages, in turn, could affect the way learners are engaged in CMC interactions. For one, the smaller language output observed in a CMC session in the present study may have been attributed to the lengthy typing procedure that takes away

the time for added interactions. Second, attempts to correct frequent typing errors might have further reduced the valuable time for interactions. Orthographical errors are fairly common in typing Japanese messages since there are two points where learners can commit errors: when typing in a word with alphabets, and when choosing the appropriate Kanji characters to be applied to the typed word. It was observed in many occasions in the present study that the learners spent extra time to fix a simple typing error. It is doubtful if learners would have spent the same amount of time and energy to fix a simple typo in an English sentence when one missed or misspelled letter would not likely to impede general comprehension of the word. In contrast, one missed long vowel or one wrongfully applied Kanji character could entirely change the meaning of the word in Japanese. Although none of the typing errors produced in the CMC sessions in the present study was serious enough to impede ongoing communication, it is possible that the learners, who were well aware of the hazard of Japanese orthography, were especially sensitive in typing errors in their messages. The difference in the target language influences the amount of time and energy spent on typing and revising messages, which in turn could potentially affect the breadth and depth of learner communication.

5.2.3 Difference in Study Duration and Learner Proficiency

The study duration and proficiency level of participants are two important variables to be considered in designing SLA studies. Yet they vary widely across previous CMC studies. The length of the study, for example, ranged from one class sitting of sixty minutes (Warschauer, 1996) to two semesters (Chun, 1994). As for the

participant proficiency, some studies have targeted beginners (Chun, 1994), while others have studied advanced learners (Kitade, 2000).

The present study was conducted in the time frame of two weeks with a group of learners in a third-year Japanese course. Although the time frame and the participant level were well within the range included in the previous studies, it is possible that a two-week period is a sub-optimal condition for assessing language acquisition benefits of CMC. As indicated by the existing disparity in the variables across CMC studies, there were no systematic studies done to indicate an optimal study period or proficiency level to produce measurable effects, if any, in a CMC study. Lack of systematic approach to determining appropriate study period and participant proficiency in CMC research may have been responsible for the deviating results of this study.

In addition, application of proficiency scale may be inconsistent across different languages. Based on Odlin's language transfer theory (1989) mentioned earlier in this chapter, English-speaking learners in a third-year French course and those in a third-year Japanese course would not have developed the same competence in their respective target languages. Therefore, uniformly labeling both groups as intermediate may not be adequate. The previous CMC studies also suggest that there may be an interaction between learner proficiency, the target language, and CMC effects. While Xie's study (2002), whose target language was Chinese, cautioned against the use of CMC with beginners, Chun (1994) reported the positive effects of CMC with the beginner-level German learners. The effect of learner proficiency on the use of CMC, in relation to the target language, needs further research. In sum, the limited control over determining all the details of study conditions as well as inconsistent categorization of learner

proficiency in different languages compound the problems of implementing an effective methodology for CMC research.

5.2.4 Development of CMC

With the advancement of technology and its resulting proliferation, CMC is now a part of the daily life for language learners. As a result, today's learners are expected to have a different experience with, and outlook on, CMC compared with learners a decade ago. My casual conversation with some of the students enrolled in Japanese courses revealed that their first choice of means for contacting friends is text messaging unless they are sure that the friend can be reached by phone. Text messaging, which refers to sending short messages between handheld devices, is followed by online chat and e-mail.

Obviously use of CMC is prevalent among young people who enroll in language courses, including the participants of the present study. All but one reported that they use e-mail and text chat daily to two or three times a week. Clearly there was a difference between the present study and the previous studies in terms of learners' previous experience and familiarity with CMC. The participants in this study, owing to their familiarity with CMC, did not need a specific instruction as to how to use the technology, unlike many others in the previous studies. It is possible that familiarity with CMC affects how learners perceive the learning experience with CMC. While increased familiarity with CMC could remove stress and frustration associated with the use of new technology, it could also reduce novelty value of the experience, leading to reduced enthusiasm.

With the rise of a new communication medium, norms for suitable and appropriate behavior towards the particular medium change over time. As use of CMC

becomes widespread, certain patterns on CMC behaviors appear to have emerged. One inclination is preference for conciseness. Kern, Ware, and Warschauer (2004), after an extensive examination of CMC research, note that today's online discourse opts for "brevity over sustained attention" (p.253). The observations made in the present study support their claim. The learner utterances in CMC tended to be short, and occasionally fragmented, in comparison with those in F2F. In addition, overall language output in CMC was smaller than in F2F. The difference in learner's language behaviors between the present study and the previous studies may well be explained by the emergence of new norms of CMC. There were no concrete norms formed yet to dictate expected CMC behaviors at the time many of the previous CMC studies were conducted. Today's learners, in contrast, generate short and brief messages in response to the new norm of CMC that favors brevity. The proliferation of CMC helps forming new norms for CMC behaviors, which in turn are changing the way today's learners participate in CMC.

An expectation and, even a preference, for brevity in CMC may not only affect language output, but also the depth of engagement in communication. The observations made in this study suggest that a preference for brevity may lead to a somewhat hasty discussion of a topic. For example, a language task assigned in one of the three study sessions instructed the learners to work in pairs to collectively make a list of conditions vital for a happy marriage. The learners in both F2F and CMC groups generated a list at the end of the discussion. While F2F pairs actively exchanged questions and made requests to the partner to defend his/her position, CMC pairs more or less accepted what was suggested by the partner without much questioning. The careless copy-and-paste

replication of the partner's erroneous sentence, as mentioned earlier, also occurred in this session. It is evident that the learners in CMC were not as critically involved in discussion as their counterparts in F2F. This observation is in line with the concern expressed by Kern et al. (2004) that CMC norm of brevity could impede learner's ability "to engage in communication at a deeper level" (p. 253). The apparent reduction in critical assessment of the partner's comments in CMC discussions, both conceptually and linguistically, is yet another outcome of CMC proliferation that was unexpected at the time the previous studies were conducted.

The comparison between the present study and the previous studies illuminates that there still exist considerable variations among CMC studies, suggesting the need for clear research directives in the field. To some extent, such discrepancies are inevitable because CMC was a relatively new medium in language classrooms when many of the previous studies were conducted. It was not too long ago that Japanese characters were not readily available in CMC. Not only technology was rapidly evolving, but instructors and learners all had different experiences with CMC. However, now that the CMC technology, or at least that of its text-based component, has reasonably well-established, carefully crafted methodology could finally draw meaningful and applicable conclusions in the body of research.

5.3 Teaching Implications

The findings of this study suggest that language instructors should approach the use of CMC in classrooms with a careful consideration of the fit between CMC use and their intended goals of its use. While prior literature has indicated an advantage of CMC use in vocabulary development, reading and writing (Felix, 2005), the results of

the present study suggest that there are other areas where the effects of CMC are yet unknown. For example, CMC instruction has not yet succeeded in demonstrating its capacity to enhance learner's oral proficiency, the object of inquiry in the present study. In this study, no significant differences were found in the quality and quantity of oral language output and the attitude towards oral communication between the CMC group and the F2F group. My findings urge instructors to seek guidance in CMC research in an effort to evaluate the value of CMC use first. The findings in prior research not only help instructors weigh the advantages and disadvantages of CMC use in advancing their instructional goals, but also provide instructors with some insights into how best to incorporate CMC instructions once the effectiveness of CMC is established.

Language instructors should also heed attention to learner attributes in order to make the best of CMC use in class. The findings of the present study suggest that such learner attributes as proficiency level, mother tongue, and typing skill may affect the degree to which the learner could benefit from the CMC experience. Learner's mother tongue in relation to the target language is reported to have an impact on the length of time it takes for a learner to reach certain proficiency (Odlin, 1989). It is also reported that low proficiency in the target language may limit the benefits of CMC instructions (e.g., Xie, 2002). Similarly, limited typing skill could get in the way of full participation into CMC, thus keeping learners from fully exploiting the benefits of CMC experience.

It should be emphasized, however, that the findings of the present study should not diminish the usefulness of CMC in distance education. Because of its relative freedom from time and space constraints, CMC has the potential to provide learning opportunities for those who otherwise have limited access to F2F interactions. Since the

findings of the present study did not indicate any definitive evidence of CMC disadvantages over F2F in Japanese learning, it is reasonable to consider that CMC experience, as prescribed in the present study, is as effective as F2F experience in promoting language learning. The findings of the present study help open the door for an integration of CMC as a sound alternative in the areas where F2F instructions are limited.

Finally, results from the present study suggest that CMC should not be used for the simple reason of it being available. CMC use may not bring in any added benefits to language learners relative to F2F instruction in some contexts. Moreover, there seem to be certain conditions under which CMC benefits may be more pronounced. In short, a decision to use CMC in language instructions should be based on the results of careful appraisal of the possible costs and benefits of CMC. Otherwise, CMC experiences compromise other instructional opportunities that are possibly more effective in certain aspects of SLA.

Chapter 6: Conclusion

CMC research now appears to be reaching a new stage in its evolution. As CMC technology has developed and gained more widespread application in the last decade, the research focus on CMC effectiveness has also evolved and shifted. In the current environment "where computers have become a natural part of the educational experience and in which we have learnt that teachers will not be replaced by them" (Felix, 2005, p. 16), researchers are looking beyond a simple dichotomy of CMC versus F2F communication. Instead, the evolving research emphasis is on identifying the impact of CMC on various aspects of language learning (Felix, 2005). Researchers are now interested in exploring specific areas where CMC can facilitate language learning. The present study, which examines the effect of CMC in improving oral performance and attitude towards oral communication, is embedded in this new line of research.

My main finding, and an important contribution of this study to the body of CMC research, is that earlier results pointing towards a beneficial role for CMC in language learning are not easily generalized to new contexts. While extant literature has generally found a beneficial role for CMC in SLA, the results of my study indicated that the impact of CMC in Japanese oral communication is more limited, and statistically non-significant. The research design in this study controls for the effect of other factors on several aspects of oral communication, and allows me to draw inferences about the impact of CMC alone on oral communication. Statistical comparison between CMC and F2F settings did not show any significant difference in learners' language output. Overall, the results in this study caution against over-generalizing the effect of CMC.

Another contribution of my study is the recognition of several notable differences in the study design: target language, study duration, and learner proficiency between the present study and prior works. Future research methodology requires incorporation of these differences into research design. Below, I offer suggestions for future research design.

First, future research should ensure the sound fit between the study goal and the study design. The central interest of many of the existing studies is to identify differences in learner's linguistic behavior or affective state between the CMC mode and the F2F mode. Therefore, their methodology primarily consisted of a comparison of language output or survey outcome on learner attitude between CMC and F2F settings. Such methodology is appropriate in revealing the ways different media lead learners to behave differently within each mode. However, the same methodology is less appropriate in measuring the ways each medium can help learners achieve certain linguistic or affective objectives, such as improvements in accuracy in oral performance or an increase in the willingness to use the target language in oral communication.

Despite the shortcoming of the method, some studies have suggested that CMC can be effective in improving oral performance. Experimental evidence from a direct comparison between CMC and F2F modes, as in this study, does not support such a claim. If a study is to make a claim of a positive effect of CMC on learner's oral performance, it needs to obtain two sets of learner's oral data, one from CMC group and the other from a control F2F group, in order to isolate the effect of CMC after controlling for extraneous factors unrelated to the question at hand. In sum, a careful

choice of study design to go with the study goal is essential in yielding valid results and robust inferences.

Another area of exploration is systematic examination of effects of such variables as the learner's mother tongue, target language, study duration, and proficiency. The comparison between the previous studies and the present study suggests that these variables have a material impact on research results. For instance, the mother tongue and the target language of a learner influence the length of time it takes for a learner to reach a given level of proficiency. Therefore, when one study does not replicate the same results as another study, it is not easy to determine whether the discrepancies indicate a flaw in either study, or whether the differences can be attributed to other variables. Future research should examine the interaction between these variables and the effect of CMC on language output.

There is one last note for further thought. As CMC becomes more and more ingrained into learners' lives, one may say that CMC is now "an authentic communication medium in its own right" (Kern et al., 2004, p. 254). What the above notion implies is that we may need to redefine what constitutes successful communication in CMC environment. Traditionally, successful communication has been defined by writing and speaking. As a result, most researchers evaluate how effectively CMC helps learners attain these skills. If the very notion of "successful communication" is to be reestablished to suit specifically the CMC environment, a wholly new set of research goals and methods may need to be developed. Researchers and instructors should keep an open mind and carefully observe the direction to which language education and CMC take in the future.

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Appendix A

Student Information Questionnaire

Please provide information about yourself. When more than one answer applies, record them all.

1. Age — a. ~19 b. 20-24 c. 25-29 d. 30+

2. Gender — a. Male b. Female

3. First language(s) — ( )

4. Experience with Japanese — (Circle all the Japanese language courses that you have taken)
   JAPAN 101 JAPAN 102 JAPAN 150
   JAPAN 201 JAPAN 202 JAPAN 301 JAPAN 302
   Other (please specify): ( )

5. Experience of living in Japan
   a. have never been to Japan
   b. have visited Japan: ( ) times, total of ( ) days
   c. have lived in Japan: ( ) months / years

6. Interactions in Japanese outside of class (including e-mail, chat etc.)
   a. daily
   b. 2-3 times a week
   c. several times a month
   d. rarely
   e. never

7. Reasons for taking Japanese
   a. degree requirement
   b. personal interest
   c. career interest
   d. other (please specify): ( )

8. Experience with communication technology in any language

8-1. E-mail	a. use daily b. use 2-3 times a week	c. use several times a month d. have never used
8-2. Text chat	a. use daily b. use 2-3 times a week	c. use several times a month d. have never used
8-3. Voice chat	a. use daily b. use 2-3 times a week	c. use several times a month d. have never used
8-4. Online discussion	a. use daily b. use 2-3 times a week	c. use several times a month d. have never used

Appendix B

General Proficiency Test

This test is designed to assess your current level of knowledge about Japanese. **There is no "best" score.** The results will be used for my research **only** and they will not be revealed to your instructor nor will it affect your grade in your Japanese course by any means.

Directions: Look at the words in the list. Place a checkmark (√) beside all the words whose meaning you could tell a friend. Note that some of the words are not real Japanese words. Do not think too long about a word; if you have any doubts, move on to the next word. You have **ten** minutes to complete this test.

Example

√ 日本語(にほんご)	むだづかい	あまえる	むさい
セックス	なやみ	へんはい	かんせい
ないさき	おらまな	ゆばい	きょくたん
もどきしい	とさらす	せんがいする	けいもん
さぬい	そのとう	ふさわしい	しゅかむ
ロマンチック	のらむい	かいもの	こきゃく
けってい	ゆうわく	うちあける	こうどう
つぶやく	とまどう	てんさん	がんばる
ちまくい	いっしょ	そくきゅう	くちべに

____ ごご	____ こなめな	____ プール	____ にんしん
____ しゅりょう	____ まごころ	____ ぬざい	____ ねいかい
____ だんこつ	____ つくす	____ かこ	____ しんこん
____ ひんろう	____ とりだす	____ ふさわしい	____ まんつい
____ つっこむ	____ などむ	____ おむつ	____ かっぱつ
____ こうさま	____ れきする	____ いりしい	____ すわみ
____ めいがい	____ きむない	____ すどむ	____ スイッチ
____ ひつよう	____ るどす	____ しゅっさん	____ ともばたらき
____ けさる	____ たいほ	____ おなむ	____ だんし
____ まくら	____ くらぐ	____ せごしい	____ まったく
____ にんかい	____ きずつける	____ うし	____ てんぼう
____ ざんねん	____ うがく	____ やぶれる	____ ちぐる
____ きれむさ	____ ほいく	____ かっぱつ	____ あらゆる
____ ほんとう	____ うるさい	____ もんぐる	____ かいしゃ
____ めどらな	____ はむけしい	____ おりるあい	____ むいる
____ いらかる	____ ずるずる	____ あやくい	____ きっぱり
____ さがる			

Appendix C

Overview of Five Discussion Sessions

Session	Group size	Mode	Task
1	4	F2F	Propose one female as a prospective girlfriend to a male friend known among all group members. Then, choose the most suitable girl to the male friend based on your knowledge of the man and the information provided about the female candidates.
2	2	F2F or CMC	Plan a day-long date. Decide on such details as time and place of activities, mode of transportation, etc.
3	2	F2F or CMC	Describe the nicest wedding that you have attended. Describe a kind of wedding you wish to have for yourself.
4	2	F2F or CMC	List the factors that you and your partner think are important for happy marriage. Then, rank the listed factors in the order of importance. Justify your choices.
5	4	F2F	Propose one male as a prospective mate to a niece known among all group members. Then, choose the most suitable man to the niece based on your knowledge of her and the information provided about the male candidates.

Appendix D

Student Attitude Survey

Directions: Below are 20 situations in which a person might choose to communicate or not to communicate. Presume you have completely free choice. Indicate the percentage of time you would choose to start a conversation in each type of situation in your mother tongue and in Japanese. Write any number between 0% and 100% that indicates how willing you are to start talking. In case of communicating in Japanese, assume that the person(s) that you are talking to can speak Japanese.

In your mother tongue:

0% <·····> 100%
I would NEVER... I would ALWAYS...

M-18	_____	Talk with a garbage collector.
M-13	_____	Talk with a service station attendant.
M-16	_____	Talk with a policeman/policewoman.
M-4	_____	Talk in a large meeting of friends.
M-12	_____	Talk in a small group of strangers.
M-17	_____	Talk with a waiter/waitress in a restaurant.
M-19	_____	Talk with a spouse (or girl/boy friend).
M-8	_____	Talk with an acquaintance while standing in line.
M-9	_____	Talk with a stranger while standing in line.
M-1	_____	Present a talk to a group of friends.
M-7	_____	Talk with a friend while standing in line.
M-10	_____	Talk in a small group of friends.
M-3	_____	Present a talk to a group of strangers.
M-20	_____	Talk with a secretary.
M-2	_____	Present a talk to a group of acquaintances.
M-15	_____	Talk with a salesperson in a store.
M-11	_____	Talk in a small group of acquaintances.
M-6	_____	Talk in a large meeting of strangers.
M-5	_____	Talk in a large meeting of acquaintances.
M-14	_____	Talk with a physician.

In Japanese:

0% <·····> 100%
I would NEVER... I would ALWAYS...

J-12	_____	Talk in a small group of strangers.
J-17	_____	Talk with a waiter/waitress in a restaurant.
J-14	_____	Talk with a physician.
J-10	_____	Talk in a small group of friends.
J-2	_____	Present a talk to a group of acquaintances.
J-16	_____	Talk with a policeman/policewoman.
J-7	_____	Talk with a friend while standing in line.
J-5	_____	Talk in a large meeting of acquaintances.
J-20	_____	Talk with a secretary.
J-3	_____	Present a talk to a group of strangers.
J-8	_____	Talk with an acquaintance while standing in line.
J-4	_____	Talk in a large meeting of friends.
J-19	_____	Talk with a spouse (or girl/boy friend).
J-6	_____	Talk in a large meeting of strangers.
J-15	_____	Talk with a salesperson in a store.
J-11	_____	Talk in a small group of acquaintances.
J-18	_____	Talk with a garbage collector.
J-1	_____	Present a talk to a group of friends.
J-13	_____	Talk with a service station attendant.
J-9	_____	Talk with a stranger while standing in line.

Your name is required for tracking research data but will be kept confidential. Also note that your response in the survey will *not* affect your grade in any way. Prior to releasing aggregated data in any publication, identifying indicators will be removed.

Appendix E

Chat Experience Survey

This survey is to follow up on your attitudinal changes, if any, towards communication in Japanese. It also enquires your view on the use of communication technology in Japanese courses.

Please indicate what you feel about the chat program by circling the applicable numbers.

	Strongly agree			Neutral			Strongly disagree
1. Chat program is easy to use.	7	6	5	4	3	2	1
2. Chat is enjoyable.	7	6	5	4	3	2	1
3. Chat is beneficial for my Japanese learning.	7	6	5	4	3	2	1
4. Chat program helps improve my speaking skills in Japanese.	7	6	5	4	3	2	1
5. Chat program helps improve my listening skills in Japanese.	7	6	5	4	3	2	1
6. Chat program helps improve my writing skills in Japanese.	7	6	5	4	3	2	1
7. Chat program helps improve my reading skills in Japanese.	7	6	5	4	3	2	1
8. Chat experience reduces anxiety in speaking in front of others in Japanese.	7	6	5	4	3	2	1
9. Chat experience increases confidence in speaking in front of others in Japanese.	7	6	5	4	3	2	1
10. I prefer chat to face-to-face discussions in Japanese.	7	6	5	4	3	2	1

11. Did you encounter any technical difficulties in using technology?
    a. No
    b. Yes (please specify):

    _____