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Comparison of face to face and synchronous computer mediated communication

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CMC   F2F   F2F CMC
Payne Whitney 2002   CMC
                                                                    CMC
                                                        F2F

This study revealed no significant difference between F2F and CMC in terms of complexity, accuracy, or fluency. It underscores the potential of CMC to complement traditional F2F interactions, which could be transformative in an era of increasing digital communication.

　　　　　　　Forty first-year university students participated in the study. They engaged in both face-to-face (F2F) and computer-mediated communication (CMC) with average durations of 11. 22 and 9.15 minutes, respectively. No significant difference was found between F2F and CMC in terms of complexity, accuracy, and fluency, contradicting the findings of Payne and Whitney (2002). The participants' regular use of computers and CMC may have contributed to this finding. The findings suggest that CMC does not hinder or enhance L2 communication, but can complement or even replace F2F communication by overcoming temporal and spatial constraints. Future research should consider different participant profiles and metrics for complexity, accuracy, and fluency.

Foreign language education-related

CMI　Distant Learning　ICT

The Ministry of Education, Culture, Sports, Science and Technology (MEXT) has emphasized the critical role of communication skills in foreign languages. A white paper released in 2011 outlines five strategies for improving English proficiency. The third strategy underlines the necessity for more opportunities to use English in the classroom and advocates for the increased use of Information and Communication Technologies (ICTs) (MEXT, 2011).

The current research project aimed to examine the contrasts in interaction modes between second language learners in face-to-face (FtoF) conversation and synchronous computer-mediated communication (SCMC), particularly via a video-chat application. Studies have indicated that the learners' eagerness to communicate in a second language is a significant influence on second language acquisition (Yashima, 2002). Additionally, the output of language is considered vital for the development of language proficiency. Learners can identify the discrepancy between what they aim to convey and what they are able to express (Swain, 1998). Classroom time thus becomes crucial, especially for learners in an English as a Foreign Language (EFL) setting. Many learners lack opportunities to practice the target language outside the classroom. Nonetheless, anxiety often accompanies these students when required to speak English in the classroom, driven by the fear of making errors, perceived negative evaluation, and the discomfort of speaking a second language with someone who shares the same first language (Kitano, 2002).

To mitigate such anxiety, alternative interaction methods have been proposed. For instance, peer communication in pairs or groups, rather than individual classroom participation, has been suggested as a way to alleviate anxiety (Young, 1991). Another strategy employed by some educators is the use of computer-mediated communication (CMC). Compared to FtoF interaction, CMC has the advantage of removing temporal or spatial limitations (Kiesler, Siegel, & McGuire, 1984; Kiesler & Sproull, 1992).

Existing literature shows varying results regarding the effectiveness of SCMC compared to FtoF interaction. Payne and Whitney (2002) discovered that online chat enhanced the oral proficiency of Spanish learners. Conversely, Baralt and Gurzynski-Weiss's (2011) study showed no significant difference in language anxiety between SCMC and FtoF interaction. Not many studies have been conducted using video-chat as the primary means of interaction, thus further investigation is needed to evaluate its potential as an effective tool for communication.

The objective of this research project was to examine the differences in interaction modes between FtoF and SCMC, particularly using a video-chat application. The project aimed to investigate the comparative effectiveness of these interaction methods in alleviating language anxiety and promoting oral proficiency in second-language learners. Moreover, this research examined the potential of CMC as a tool to overcome temporal and spatial limitations in language learning. Given the mixed results in existing literature regarding the effectiveness of SCMC over FtoF interaction, this study also sought to add to the body of knowledge by providing empirical evidence for the effectiveness of distance learning via ICT, specifically focusing on the use of video-chat as a means of interaction. The aim was to offer a more effective approach for practicing oral communication in second-language learning and to empirically substantiate the efficacy of ICT-facilitated distance learning.

Participants for the study were recruited from the institution where the researcher was employed at the time. A total of forty participants were randomly grouped into pairs, resulting in 20 dyads. Each pair participated in two picture description tasks. One task was conducted FtoF, while the other was facilitated via Google Hangout, a video chat application. Both tasks involved role-playing in which participants were instructed to assume the role of a university student. Each participant was given detailed information about their role and the goal they needed to accomplish as part of the collaborative effort. Tasks were considered complete when participants felt they had completed their respective tasks. There was no predetermined time limit for the paired work. In Task 1, participants were asked to decide on a dinner location, which was conducted F2F, while in Task 2 they were asked to decide on a vacation destination while communicating using CMC. To minimize any order effect, the tasks were counterbalanced. Every task was audio-recorded and later transcribed to evaluate

the participants' speaking proficiency in terms of complexity, accuracy, and fluency. Complexity was assessed based on the number of words per AS-unit. The number of errors per AS-units was used as a metric for accuracy. Lastly, fluency was evaluated by measuring the length of pauses per AS-unit.

The present study comprised forty participants, including 16 females and 24 males. All were first-year university students. On average, F2F paired work lasted 11.22 minutes, with a standard deviation (SD) of 9.31 minutes. The duration of these conversations varied, with the shortest being 2.34 minutes and the longest being 32.1 minutes. Conversely, the CMC paired work had an average duration of 9.15 minutes, with an SD of 6.69 minutes. The shortest and longest conversations in this mode were 2.15 minutes and 30.35 minutes, respectively.

The table below illustrates the descriptive statistics for complexity, accuracy, and fluency for both F2F and CMC. On average, the number of words per AS-unit in F2F was 5.51, while it was slightly higher in CMC at 5.66. In terms of accuracy, participants made an average of 0.44 vocabulary and grammatical errors in F2F and a slightly higher average of 0.47 errors in CMC. Finally, the average pause length per AS unit was 0.98 seconds in F2F, which increased to 1.10 seconds in CMC.

Table

Descriptive statistics

	n	*M*	*SD*
Complexity F2F	40	5.51	3.94
Complexity CMC	40	5.66	3.03
Accuracy F2F	40	0.44	0.29
Accuracy CMC	40	0.47	0.35
Fluency F2F	40	0.98	0.57
Fluency CMC	40	1.10	0.88

As the data did not meet the assumptions for a paired samples t-test, the Wilcoxon Signed Rank Test was used to compare complexity, accuracy, and fluency between F2F and CMC interactions. The Wilcoxon Signed Rank Test indicated that the mode of interaction did not result in a statistically significant difference in complexity ($z = -0.49$, $p = .62$), accuracy ($z = -0.28$, $p = .78$), or fluency ($z = -0.40$, $p = .69$).

Contrary to the findings of Payne and Whitney (2002), the current study found that online communication did not significantly enhance participants' oral proficiency. One possible factor contributing to the lack of significant differences between the two modes of communication in all three aspects measured -complexity, accuracy, and fluency- may be the participants' regular use of computers and CMC. The university the participants were enrolled in for this study required students to bring computers to class, to use Slack (an instant messaging application) for communication, and to occasionally engage in online pair work via video chat programs. Therefore, unlike the circumstances described by Young (1991), the prevalence of CMC may not have made the participants' experience of online communication significantly different from face-to-face interactions.

Furthermore, it is important to note that the data collection for this study took place before the COVID-19 pandemic. Therefore, what was once considered a unique environment is no longer so in 2023, as the majority of students are now accustomed to extensive use of online communication. Consequently, if data were collected under current circumstances, the results may show a similar pattern.

There are certain limitations to this study that warrant attention. First, the participants involved were well-skilled in the use of computers and technology due to their IT-related academic major. In order to generalize the findings to a broader population, future research must consider a more diverse group of participants. Second, there is an ongoing debate about the most appropriate metrics for assessing complexity, accuracy, and fluency (Norris & Ortega, 2009). Thus, reanalyzing the data using different measures could potentially yield different results. Finally, the impact of the COVID-19 pandemic needs to be

addressed. There has been a dramatic change in the way people interact online before and after the pandemic. Exploring whether the abundant exposure to online communication during the pandemic has changed people's perceptions of CMC would indeed be a valuable area of study.

The major takeaway from the study is that, based on the limited data obtained, CMC does not appear to hinder second language learners' communication, although it does not appear to enhance it. As emphasized in previous studies (Kiesler, Siegel, & McGuire, 1984; Kiesler & Sproull, 1992), the primary advantage of CMC lies in its ability to overcome temporal and spatial constraints. This advantage became even more apparent during the COVID-19 pandemic. The findings suggest that the absence of F2F communication can be complemented and potentially replaced by CMC.

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