
The Effect of Synchronous and Asynchronous CMC on Oral Performance in German

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It has been frequently suggested that computer-mediated-communication (CMC) can help learners improve their oral proficiency. This study tested that suggestion by comparing the performance of 3 groups of learners (a control group, a synchronous CMC group, and an asynchronous CMC group) on 3 oral discussions tasks during the course of 1 semester. The number of idea units and words, the lexical richness and diversity, and the syntactic complexity of learner language served as dependent variables. Although this study confirmed a previously reported increase in quantity of language produced by students in the synchronous CMC group compared to the other two groups, the asynchronous CMC group did not outperform the control group. Furthermore, analyses of the quality of language indicated no significant differences among the 3 groups either lexically or syntactically.

COMPUTER-MEDIATED COMMUNICATION (CMC) has increasingly received recognition for its ability to improve foreign language (FL) performance, presumably by creating a more positive collaborative learning environment. This environment, in turn, results in more interactive discourse (Abrams, 2001; Chun, 1994; Darhower, 2000; Sullivan & Pratt, 1996) and in higher amounts of learner output and improved attitudes both toward language learning (Beauvois, 1995; Blake, 2000; Kern, 1995; Warschauer, 1996) and cultural studies (Fraser, 1999; Schneider & von der Emde, 2000) compared to face-to-face communication in the classroom.

Several studies have raised the question of how well the language abilities (often measured in terms of syntactic complexity, lexical density, and diversity) that learners display in the CMC context can improve oral communication. However, only one pilot study to date has focused on this issue explicitly. Beauvois (1997) reported that learners who participated in CMC outperformed

their non-CMC peers in oral exams, when the scores were related to pronunciation, grammatical accuracy, lexical choice and accuracy, and content.

The present study addresses two related aspects of the transferability of language skills (lexical richness, lexical density, syntactic complexity, and amount of language) from CMC to oral interaction. First, it tested further the hypothesis that synchronous CMC has a positive effect on oral performance. Second, it aimed at detecting possible differences in the effects of synchronous and asynchronous CMC on oral performance.

REVIEW OF LITERATURE

CMC in Second Language Learning

Research on CMC for improving FL performance is becoming increasingly abundant. Studies thus far have suggested that learners participating in CMC feel more involved in the development of ideas, in determining the path discussion topics take, and in the selection and termination of these topics (Kelm, 1992; Kern, 1995; Ortega, 1997). Learners' attitudes and mo-

tivation also appear to be more positive in this type of interactive context than in face-to-face discussions (Beauvois, 1995, 1997, 1998). In addition, learner-to-learner exchanges in CMC appear to be more interactive (Blake, 2000; Darhower, 2000; Kern, 1995; Warschauer, 1996), and the discourse patterns reflect the use of a wider range of social and language functions (Abrams, 2001; Chun, 1994) than is true in face-to-face communication. Language features, such as syntactic complexity, lexical sophistication, and amount of speech, also appear to support the continued use of CMC (Beauvois, 1997; Warschauer, 1996). Given CMC's format as semispeech (Fraser, 1999), the question that arises is whether skills that learners demonstrate in this modality may ultimately transfer to face-to-face interactions: Might practice in the CMC context improve oral performance as well?

If formal written and spontaneous oral language reflect two ends of a continuum, CMC is situated between them linguistically, but it is slightly closer to the written than the oral modality (Yates, 1996). CMC differs from these other modalities in such respects as immediate audience, medium of interaction, and time, but it shares characteristics with them, including register, discourse patterns, and syntactic complexity (Chun, 1994; Kern, 1995; Wang, 1993; Warschauer, 1996). CMC may, therefore, provide a useful and important stepping stone for second language development (Chun, 1994).

Face-to-Face Communication

Face-to-face communication, which in the case of most languages means oral communication, is a staple of everyday interactions and has been recognized as an important learning objective in most current approaches to FL teaching. An important aspect of face-to-face communication is the individual's ability to decode input, process it, and simultaneously plan his or her output, as well as make immediate decisions about style, register, cultural referents, pronunciation, lexicon, and syntax, both in listening and speaking. In addition to the knowledge of social roles, sociolinguistic rules, socially and culturally relevant information, and general world knowledge, decoding and encoding input also simultaneously require the mastery of linguistic forms (Saville-Troike, 1993).

Researchers (Bachman, 1990; Doughty, 1991; Warschauer, 1996) describe various linguistic features that mark the building blocks of oral proficiency, such as lexical richness, lexical diversity,

and syntactic complexity (e.g., use of subordinate, relative, and infinitive clauses). The presence of these linguistic features reflects increasing communicative sophistication.

Savignon (1983) claims that learners must practice meaningful output in order to improve oral communicative competence and that the more they practice, the better their oral skills become. Research has shown that modified learner-to-learner interactions, especially, increase learners' communicative ability (Gass & Varonis, 1994; Long, 1996). Because CMC is interactive, learners using it produce more language with a richer lexicon than they do in face-to-face conversations (Beauvois, 1997). It has, therefore, the potential to contribute significantly to such learners' language sophistication in the oral modality as well.

CMC and Transferability to Oral Communication

Before we can discuss the transferability of CMC skills to face-to-face communication, we must draw a distinction between synchronous CMC (SCMC)—real-time, such as chatrooms—and asynchronous CMC (ACMC)—delayed-time interaction such as email or Web-based bulletin boards. Research examining the possible differences between SCMC and ACMC in the level of lexical richness, density, and syntactic complexity is not yet available. However, several similarities and differences between these two types of electronic communication are evident (see Table 1).

Although CMC is different from face-to-face oral communication, in that it relies heavily on literacy skills (reading and writing, which may add an additional "burden" to decoding and encoding meaning), this modality also offers assistance, in that learner-to-learner communication is not hampered by pronunciation errors (although spelling mistakes could interfere in ways that likely would not occur in an aural modality). Additionally, because SCMC has reduced immediacy compared to face-to-face communication, this modality allows more time for processing input, extending learner "talk" time, and, thus, improving learner interlanguage. Therefore, although CMC is a modality in its own right (because it is used ever more frequently by native speakers as a separate way of communication), CMC—especially synchronous CMC—may prove to be effective as a preliminary step toward face-to-face communication, as a form of prespeech. The purpose of the present study was to address this issue. Specifically: Does CMC have a positive effect on oral performance in intermediate German courses? In other words, does CMC result in

TABLE 1
Similarities and Differences: Synchronous and Asynchronous CMC

	Synchronous CMC	Asynchronous CMC
Similarities	Extensive learner-to-learner (or learner-learner-teacher) negotiation of meaning More “talk” time per learner than oral classroom communication Increased amount of output results in richer and more diverse lexicon Written code Register between those of written and oral styles of communication	
Differences	Relatively immediate responses Use of outside resources cumbersome Social immediacy of interlocutors	Extended planning, encoding, decoding time Use of outside resources not limited Interactants not “immediately” present

increased language output (which can contribute to increased fluency and general proficiency), a richer and more diverse lexicon, and syntactically more sophisticated language?

THE PRESENT STUDY

Participants

The participants in this study were 96 students of intermediate, third-semester German at a large Midwestern university, in six sections of this course. These students had completed 2 semesters of German at that institution or the equivalent. In this quasi-experimental study, participants comprised intact groups (i.e., an entire class, not randomly selected), as they had been assigned by the registrar’s office on the basis of other courses in which they enrolled that semester. The regular class meeting times were the same for all six groups; each met three times every week for 50 minutes.

For the study, two of the six sections (the control group) remained in their regular classrooms, two sections (treatment group A) met in the IBM computer lab to participate in SCMC using a WebCT chat tool, and the remaining two sections (treatment group B) participated in week-long sessions of APMC using a WebCT bulletin board feature for delayed-time interaction prior to each of the two treatments. Table 2 shows the differences in treatment among the control group and the two treatment groups.

All students in both treatment conditions had general computer skills and were familiar with the WebCT chatroom and bulletin board. Without exception, they had participated in English chatrooms and had also used the university’s bulletin board system extensively for other classes. The class enrollment for each of the six sections was between 18 and 22. Only the data for those students who (a) gave permission to use their data and (b) participated in every oral discussion (and CMC sessions, where applicable) were

TABLE 2
Number of Participants in the Control and Treatment Groups

Group	Treatment before Oral Discussion	Participants
Control	No CMC; students complete regular class activities based on textbook. Small group and pair work; collaborative reading and writing tasks. Textbook-based interviews—Lesson’s topic combines articles for the oral discussion, textbook themes, and the learners’ own experiences.	<i>N</i> = 33
Treatment A	Synchronous CMC (50 minutes) on the day immediately preceding the 2nd and 3rd oral discussion days Discussion topic combines articles for the oral discussion, textbook themes, and the learners’ own experiences	<i>N</i> = 32
Treatment B	1-week long asynchronous CMC beginning the Friday before the 2nd and 3rd oral discussion days Discussion topic combines articles for the oral discussion, textbook themes, and the learners’ own experiences.	<i>N</i> = 31

used. As a result, there were 33 participants in the control group, 32 in treatment group A (SCMC), and 31 in treatment group B (ACMC).

Four instructors were involved in the study: three women (one native speaker of German who taught two sections, the other two native speakers of English each teaching one section) and one man (a bilingual speaker of German and English who taught two sections). The man and two of the women were graduate teaching assistants; the third woman was a lecturer. All four had taught third-semester German previously; none of them had any previous knowledge of the CMC tools of WebCT. They did not participate in either the oral discussions or the CMC sessions.

Description of Treatments and Oral Discussions

Students in all sections participated in three entire-class oral discussions during the course of the semester. The first oral discussion (on the Friday of the 3rd week of the semester) was not preceded by any treatment manipulation. The data served as a baseline measure for the learners' oral performance at the beginning of the semester, prior to any treatment. The second and third oral discussion days were preceded by the various treatments:

1. The control group did regular classroom exercises (small-group work, vocabulary building, etc.).

2. Treatment group A participated in 1 hour of synchronous CMC using WebCT's chat tool on the day immediately before the oral discussion day.

3. Treatment group B participated in a week-long asynchronous CMC session using WebCT's bulletin board tool, beginning exactly 1 week before the oral discussion day.

The topics for the three discussions matched the themes covered in the textbook used for third-semester German, *Kontakte* (Terrell, Tschirner, & Nikolai, 2000). They addressed current events, expanded students' vocabulary and cultural knowledge of the German-speaking world, and allowed comparisons of these topics in the German-speaking countries and the learners' own cultures.

To prepare for the oral discussions, students received one of three or four articles to read the Friday before the discussion. These articles presented information on the same topic from dif-

ferent perspectives or points of view. They were selected to stimulate a more intense exchange of ideas and to promote collaborative learning (learners teaching each other about the content, vocabulary, and cultural information). For example, for the first discussion, 5 students received a German article taken from the Internet describing the signs and causes of anorexia nervosa, another 5 students received an article from a German magazine on healthy eating habits, a third group of 5 received an article describing hunger in Rwandan refugee camps, and the last 5 students an Internet-based article discussing what people could and should do if they suspected a friend of having an eating disorder. Approximately the same number of students read each article. The instructor, not the students, selected the articles. The list of article and discussion topics appears in the Appendix.

The oral discussions always occurred on a Friday in a large-group discussion format. For the first oral discussion, learners met in their regular classrooms after regular days of instruction; no treatment preceded it. For the second and third oral discussions, following the distribution of the articles, the control group met both on Monday and Wednesday and did what they routinely did—exercises from the textbook, reading comprehension tasks, small group and pair work, interviews pertaining to the topic in the chapter (therefore also to the assigned readings). Treatment group A (SCMC) went to the computer lab on Wednesday (the class period immediately preceding the oral discussion) to have a real-time electronic discussion about the topic, exchange information about the articles, and relate personal experiences and opinions. Each student used a separate computer and his or her own name for the online discussions.¹ Treatment group B always began its asynchronous dialog on the same day that the members received their reading assignments (i.e., on the Friday, a week before the oral discussion day). Participants were able to go into the discussion room and post as many comments as they wished. Learners in this group also used their own names. Table 3 presents an outline of the three groups' activities during the study.

Research Questions

This study used a quasi-experimental, intact class design and addressed the following questions and related hypotheses regarding the im-

TABLE 3
Lessons During the Research Period (2nd and 3rd oral discussion days)

	Friday	Monday	Wednesday	Friday
Control Group	Regular class activities; receive articles	Regular class activities (non-article-based)	Regular class activities (based on textbook and articles)	
Treatment A	Regular class activities; receive articles	Regular class activities (non-article-based)	SCMC (based on textbook and articles)	Large-group oral discussion in class
Treatment B	Regular class activities; receive articles	Regular class activities (non-article-based)	Regular class activities (non-article-based)	
	Begin ACMC—continue until Thursday evening (discussions based on textbook and articles)			

pect of CMC on the development of oral proficiency in the FL:

1. Does CMC (synchronous or asynchronous) result in better oral performance than traditional classroom tasks (e.g., small-group work)?

H₁: CMC will have a positive effect on oral performance.

2. If so, is there a difference between the effects of asynchronous or synchronous CMC on oral performance?

H₀: There will be no difference in the oral performance of students in the SCMC and the ACMC groups.

Better oral performance, here, refers to language that reflects higher levels of syntactic complexity, lexical richness and density, and an increased amount of output because these features have been used in the literature previously to attest to CMC's "improved language performance." A directional hypothesis was used for the first research question, based on the findings from previous literature, and a null hypothesis for the second question, given that the differential effects of SCMC and ACMC have not yet been examined.

Methods for Data Collection

For analyzing the effects of synchronous and asynchronous CMC on students' language production, interactions at all three large-group oral discussions were audiotaped using a sensitive Panasonic field recorder and were then transcribed by the researcher. The audiotaping was done by each instructor in order to eliminate possible interference effects from the researcher's presence during the discussions be-

cause she was never present during regular instruction. The data collection resulted in approximately 18 hours of audiotaped discussions.

Methods of Data Analysis

To determine the effects of SCMC and ACMC on learners' performance in face-to-face communication, learners' oral output was analyzed according to gains in scores between the pretest and the final oral discussion (i.e., the difference between pretest and posttest scores). Gain scores were calculated for the number of communicative units (c-units), lexical richness, lexical density, and syntactic complexity.

The gain scores on each of these linguistic aspects were compared for the control, treatment A, and treatment B groups using balanced between-groups one-way analyses of variance for each dependent variable. The level of confidence for all statistical analyses was .05. Data were triangulated through reanalysis by the researcher a month after the first analysis. The estimated intrarater reliability was .98.

Amount of Language Output: C-units

For determining the amount of language that learners produced, c-units were used for analysis. C-units are "isolated phrases not [necessarily] accompanied by a verb, but they have a communicative value" (Crookes, 1990, p. 184). Although in literature, the most frequent type of analysis of oral output is the utterance (Bardovi-Harlig, 1992), in this study preference was given to the c-unit because determining what an utterance is depends heavily on intonation and pauses (Sato, 1985), and the students did not necessarily have

clear control of intonation and paused frequently in lieu of using hedges and conversational fillers. Therefore, it was more appropriate and accurate to analyze their language according to idea units than according to utterances, t-units, or turns. Furthermore, utterances referred to comments speakers make to each other; they were context-specific and were used qualitatively to determine how meaning is co-constructed by different interlocutors (Coulthard, 1985; Schiffrin, 1994); therefore, utterances did not seem appropriate for analyzing the amount of individual output in isolation from the context of the entire interactive discourse. C-units also shed light on multiple messages provided by one individual during one turn and, thus, provided a sensitive and accurate measure of the amount of language produced by the participants.

Lexical Richness and Lexical Density

For determining lexical richness, the number of different words (both function and content words) was divided by the total number of words a learner uttered (Laufer & Nation, 1995). As Warschauer (1996) points out, "A higher TTR [type-token ratio] is generally considered to indicate greater complexity" (pp. 13–14). Furthermore, because lexical richness varies with the length of passage, the same total number of words were taken from each learner for analysis (Saville-Troike, personal communication). This number was set at 12 because that was the shortest output provided during all oral discussions, with the resulting formula:

$$\text{lexical richness} = \frac{\# \text{ of different words [function + content words]}}{12 \text{ tokens}}$$

Information concerning lexical density can provide additional information about the sophistication and type of lexicon that students produce. In the study, lexical density was determined by counting the number of nouns, verbs, adjectives, and adverbs, which was divided in turn by 12 German words (including both function and content words). For both analyses, the same base morpheme was counted twice if it appeared as a different word category (part of speech). For example, the words *meinen* ('to mean') and *Meinung* ('opinion') were counted as two words because they have different meanings and are different parts of speech. Similarly, masculine and feminine versions of professions were counted as sepa-

rate items, though plural forms of nouns were not. Thus, the formula for calculating lexical density was:

$$\text{lexical density} = \frac{\# \text{ of lexical items}}{12 \text{ tokens}} \\ \text{[nouns + verbs + adjectives + adverbs]}$$

Syntactic Complexity

The coordination index provided information about the complexity of learners' language output. This index, "considered to be inversely proportional to complexity, since more advanced writers or speakers of a language generally use proportionally more subordination than do beginners" (Warschauer, 1996, p. 14) was calculated by dividing the number of independent clauses "by the total number of combined clauses (independent coordination plus dependent subordination)" (Warschauer, p. 14).

FINDINGS

The purpose of this study was to examine explicitly and confirm previous findings that CMC is a good preparation for face-to-face interactions. Furthermore, this study investigated possible differences between synchronous and asynchronous CMC's ability to promote oral skills. The following sections present the results of the various sub-analyses (amount of speech, lexical richness and diversity, and syntactic complexity) and discuss the implications for further research and FL pedagogy.

Amount of Speech

According to the ANOVA results, as Table 4 (for c-units) and Table 5 (for number of words) illustrate, there was a significant difference among the means of the three groups in terms of amount of speech produced during face-to-face discussions. Post hoc analyses using Scheffé tests revealed that members in both the control group and treatment group A (SCMC) significantly outperformed their peers in treatment group B (ACMC) when measuring the number of words and that treatment group A (SCMC) outperformed treatment group B (ACMC) when measuring the number of c-units. These results indicate that the practice effects of SCMC, where learners had been found to produce more output than during oral discussions, transferred even to ensuing face-to-face conversations. Surprisingly, participants in treatment group B

TABLE 4
Gain Scores: Number of C-units—Results of a One-Way ANOVA

Groups	<i>N</i>	<i>Mean</i>	<i>Variance</i>			
Control	33	9.88	127.9			
Treatment A	32	15.16	230			
Treatment B	31	5.65	23.17			
Source of Variation	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p-value</i>	<i>F-crit</i>
Between groups	1432	2	716	5.59	0.00512	3.094343
Within groups	11923	93	128			
Total	13355	95				

(ACMC) were outperformed by both the SCMC and the control group (face-to-face) in terms of quantity of output. This finding suggests that even small-group, face-to-face discussions better promote oral interactions than delayed-time, asynchronous CMC exchanges.

Lexical Richness and Density

Although according to raw numbers (a) the control group performed at more than twice the level of the experimental groups in terms of lexical richness, and (b) treatment group A produced speech that was lexically more dense than either of the other two groups, the differences were not statistically significant. Future research might focus on why.

Syntactic Complexity

As Warschauer (1996) points out, syntactic complexity is related to oral sophistication: as learners' language skills become more sophisticated, they use increasingly more subordination. Unfortunately, the results for this ANOVA indicated that the three groups performed without

any significant differences regarding this linguistic feature. Even though the ACMC group used more subordinate, relative, and infinitive clauses during their computer-mediated communication, this usage did not transfer to their oral exchanges. Their use of these features may merely reflect the different perception of ACMC as requiring a higher register (such as formal writing) with more complex sentence structures.

CONCLUSIONS

First, the results of the present study were inconsistent with previous findings showing that students who participated in CMC produced more language during consequent oral discussions than their counterparts who did not have the same preparation (Beauvois, 1995; Blake, 2000; Kern, 1995; Warschauer, 1996). However, this claim must be modified to reflect the fact that the students who participated in SCMC outperformed those in the control group, but that students in the ACMC group actually produced significantly less output than their peers. This study did not follow up with personal interviews or a questionnaire to examine the causes of this dif-

TABLE 5
Gain Scores: Number of Words—Results of a One-Way ANOVA

Groups	<i>N</i>	<i>Mean</i>	<i>Variance</i>			
Control	33	43.1	3069			
Treatment A	32	68	5702			
Treatment B	31	3	1199			
Source of Variation	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p-value</i>	<i>F-crit</i>
Between groups	67024.6	2	33512.3	10.02	0.000114	3.094343
Within groups	310941	93	3343.5			
Groups	377965.8	95				

TABLE 6
Gain Scores: Lexical Richness—Results of a One-Way ANOVA

Groups	<i>N</i>	<i>Mean</i>	<i>Variance</i>			
Control	33	0.11	0.061			
Treatment A	32	.05	0.017			
Treatment B	31	.05	0.069			
Source of Variation	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p-value</i>	<i>F-crit</i>
Between groups	0.091529	2	0.04576	0.929	0.398612	3.094343
Within groups	4.581745	93	0.04927			
Total	4.673274	95				

ference. It is possible that learners in the ACMC group were less motivated to participate in the discussions as a result of the extended nature of the interaction; they sometimes had to wait several days before other members of their discussion group contributed their own comments. Such delays interrupt the discursive momentum and could reduce motivation. Alternately, learners may have taken “out of class” assignments less seriously than students who participated in face-to-face or SCMC interactions, which took place within the regular classroom setting. These questions need to be addressed by future research that investigates learners’ attitudes towards the different CMC modalities (ACMC and SCMC).

An important point to remember is that an increased amount of output can be beneficial. The amount of language that learners produced per minute did significantly increase for the SCMC group; with a mere two SCMC sessions, learners were able to produce significantly more language in the same period of time than their peers who had practiced in ACMC and face-to-face contexts. Being able to produce more language in a given amount of time, using sentence-level or even suprasegmental-level utterances, is a

sign of increasing fluency (Leeson, 1975). Learners can access the necessary lexical items with greater facility and speed, which contributes more knowledge to the common exchanges, as well as promotes the learners’ interlanguage development. Being able to articulate their ideas with greater ease might, furthermore, contribute to their motivation and attitude toward both the language task and the language itself.

Second, although this research reconfirmed that the amount of output increases with the use of SCMC, the quality of language produced (measured by lexical richness and diversity and syntactic complexity) showed no significant differences among the control and treatment groups. However, this lack of difference might be misleading; there could be significant interactional differences for the three types of groups. For example, Bachman (1990) points out that discourse cohesion is an important indicator of linguistic development, and, more specifically, of oral proficiency. When learners connect others’ previous comments explicitly to their own, scaffold others’ ideas and language, and react to others’ messages explicitly, it indicates a more cohesive discussion and reflects more sophisticated

TABLE 7
Gain Scores: Lexical Density—Results of a One-Way ANOVA

Groups	<i>N</i>	<i>Mean</i>	<i>Variance</i>			
Control	33	0.078485	0.032501			
Treatment A	32	0.013375	0.031237			
Treatment B	31	0.039355	0.029986			
Source of Variation	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p-value</i>	<i>F-crit</i>
Between groups	0.141988	2	0.07099	2.27	0.10896	3.094343
Within groups	2.907961	93	0.03127			
Total	3.049949	95				

TABLE 8
Gain Scores: Syntactic Complexity—Results of a One-Way ANOVA

Groups	<i>N</i>	<i>Mean</i>	<i>Variance</i>			
Control	33	0.119545	0.056899			
Treatment A	32	0.120938	0.038707			
Treatment B	31	0.157581	0.060081			

Source of Variation	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p-value</i>	<i>F-crit</i>
Between groups	0.029312	2	0.01466	0.285	0.752754	3.094343
Within groups	4.784434	93	0.05145			
Total	4.813746	95				

interpersonal communication skills. Future research should examine and provide information about the interactional competence of learners prepared for face-to-face communication by SCMC, APMC, and regular classroom interaction. The differences might very well prove significant.

As stated earlier, this study focused on quantifiable measures of language skills accepted previously in CMC literature. Future research must examine alternate ways of interpreting “improved language use” that more accurately reflect—and utilize—the interactive, collaborative nature of CMC. For example, types and frequency of interactions, intensity and success of negotiation of meaning, and learner attitudes toward language task and language itself could be examined to provide further information concerning the benefits of APMC, SCMC, or both for face-to-face interactions.

Future studies should also re-evaluate the current findings based on more frequent CMC sessions. Due to space limitations (lab availability) and the low number of language classes per week for third-semester German, students in these courses were able to partake in only a very few CMC sessions. It is possible that long-term use of CMC (over several semesters or years)—with the increased opportunities for interaction this medium provides—may indeed prove to have significant benefits for the development of oral communicative competence.

PEDAGOGICAL IMPLICATIONS

The findings of this study indicated that although the amount of language output during face-to-face interaction was significantly greater for the group that prepared for face-to-face interactions with SCMC than for the control group or

treatment group B, the quality of their language (as measured in lexical richness, diversity, and syntactic complexity) was not better. Nonetheless, it would be unadvisable to conclude from these findings that CMC is not a beneficial tool for language learning. Previous studies have consistently discovered that CMC promotes equal participation among language learners (Chun, 1994; Kern, 1995; Warschauer, 1996), especially improves the chances for participation by learners who might feel marginalized in face-to-face conversations (Warschauer, 1996), and increases student motivation (Beauvois, 1995; 1997). As suggested above, future research might reveal that increased amounts and long-term use of SCMC are a significant contributor to success in oral communication perhaps even using the evaluation criteria set forth in this study. Finally, it is important to remember that CMC should continue to be seen as a tool for interaction in its own right and that training communication via this medium can help learners prepare for Internet-mediated or other computer-mediated authentic interactions.

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NOTE

¹ Students were asked to use their own names (a) to reduce instances of “flaming,” which has been attrib-

uted to the anonymous nature of many types of computer-mediated communication, and (b) to make the CMC data more consistent with the small-group, face-to-face interaction in which students in the control group participated during regular class periods.

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 APPENDIX
 Dates and Topics of Discussions

	Date	Article Topics	Discussion Topic
First Discussion	Friday of week 3	a) Signs and causes of anorexia nervosa b) Eating healthy: vitamins, grains, health food and exercise	Studying, working: Finances & eating well
	(no treatment)	c) Hunger in Africa: The case of Rwandan Refugees d) What can you do when your friends have an eating disorder?	(Based on textbook chapter and an article in the school newspaper)
Second Discussion	Friday of week 8	a) Not just mere revenge (racial bias in applying the death penalty) b) Long incarceration for stone-throwers (3 American teens sentenced in Germany for throwing stones from a bridge at drivers, causing 2 deaths)	Justifying and applying the death penalty
	(1st treatment precedes)	c) Karl und Walter LaGrande (2 German teenagers who were executed in Arizona for a robbery turned murder)	(Pertaining to Tim McVeigh's upcoming execution)
Third Discussion	Friday of week 13	a) Divorce rates in Germany and the United States b) When should one marry?	1. Causes of divorce and its after-effects 2. Power in a family or relationship
	(2nd treatment precedes)	c) Gender roles in modern relationships	(Based on textbook chapter)

 Forthcoming in *The Modern Language Journal*

Glenn S. Levine. "Student and Instructor Beliefs and Attitudes about Target Language Use, First Language Use, and Anxiety: Report of a Questionnaire Study"

Máximo Rodríguez & Orángel Abreu. "The Stability of General Foreign Language Classroom Anxiety across English and French"

Grit Liebscher & Jennifer Dailey-O'Cain. "Conversational Repair as a Role-Defining Mechanism in Classroom Interaction"

François Pichette, Norman Segalowitz, & Kathleen Connors. "Impact of Maintaining First Language Reading Skills on Second Language Reading Skill Development in Adults: Evidence from Speakers of Serbo-Croatian Learning French"

Yoshiko Mori. "The Roles of Context and Word Morphology in Learning New Kanji Words"

CMLR Exchange Article: Bernard Mohan & Gulbahar Huxur Beckett. "A Functional Approach to Research on Content-Based Language Learning: Recasts in Causal Explanations" (reprinted from *The Canadian Modern Language Review*, 58, 1, 2001)

David P. Benseler & Suzanne S. Moore. *Doctoral Degrees Granted in Foreign Languages in the United States: 2002*
